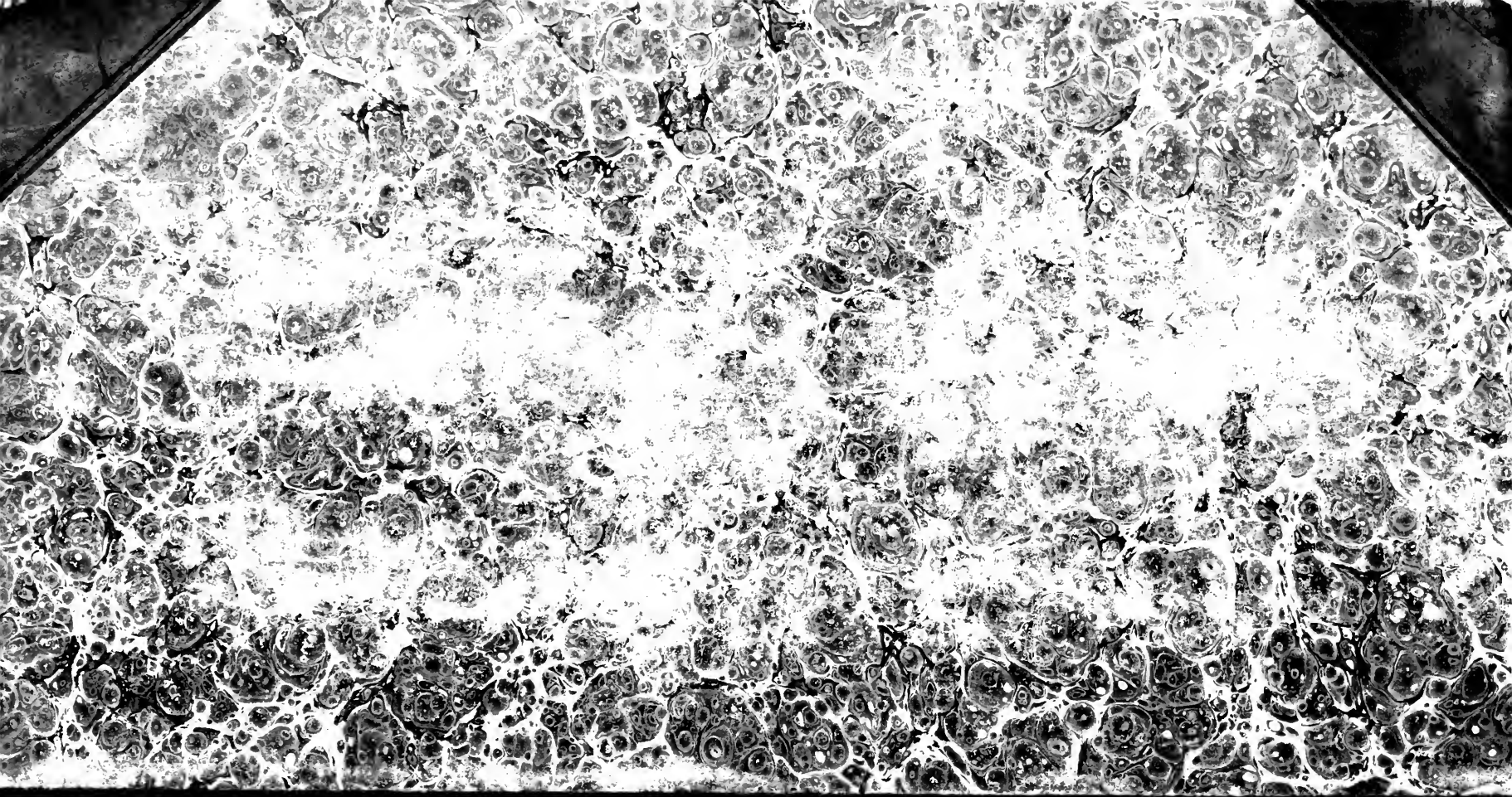

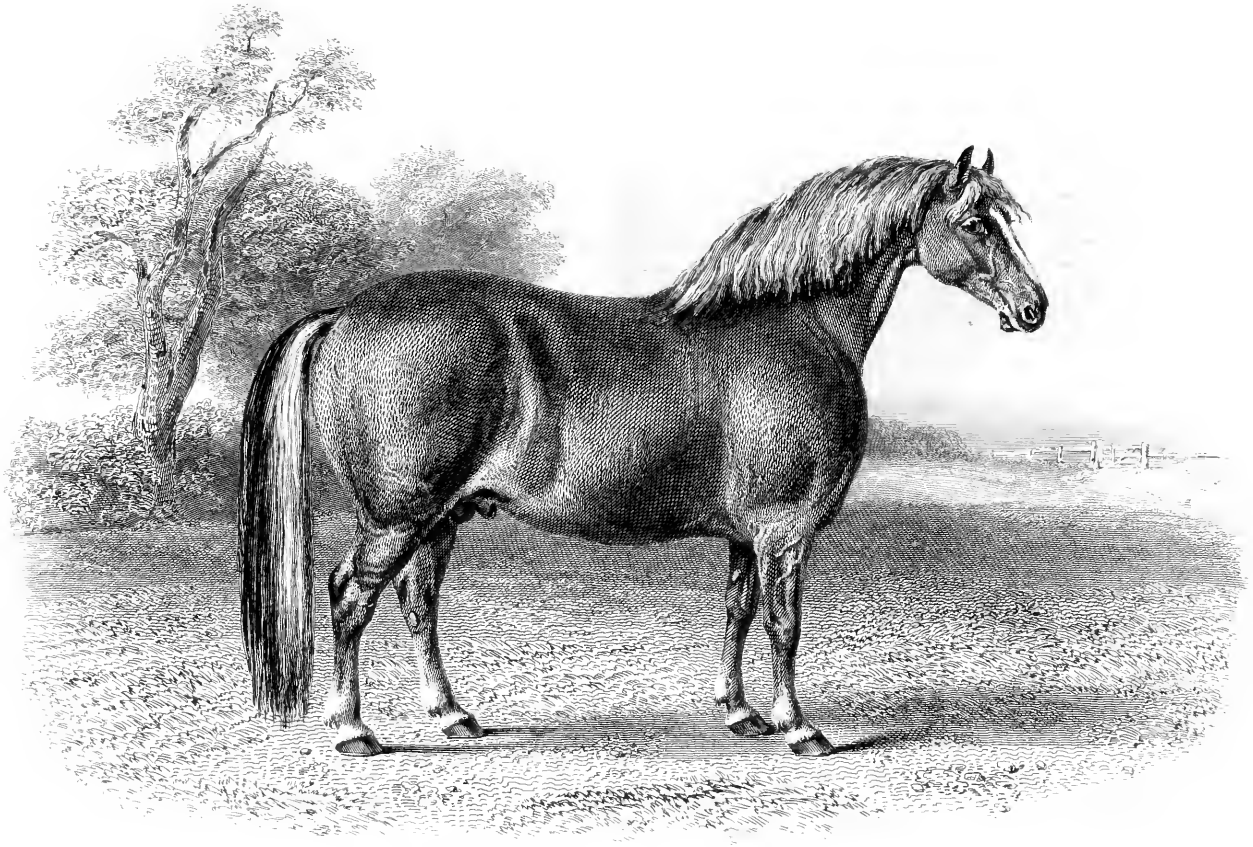

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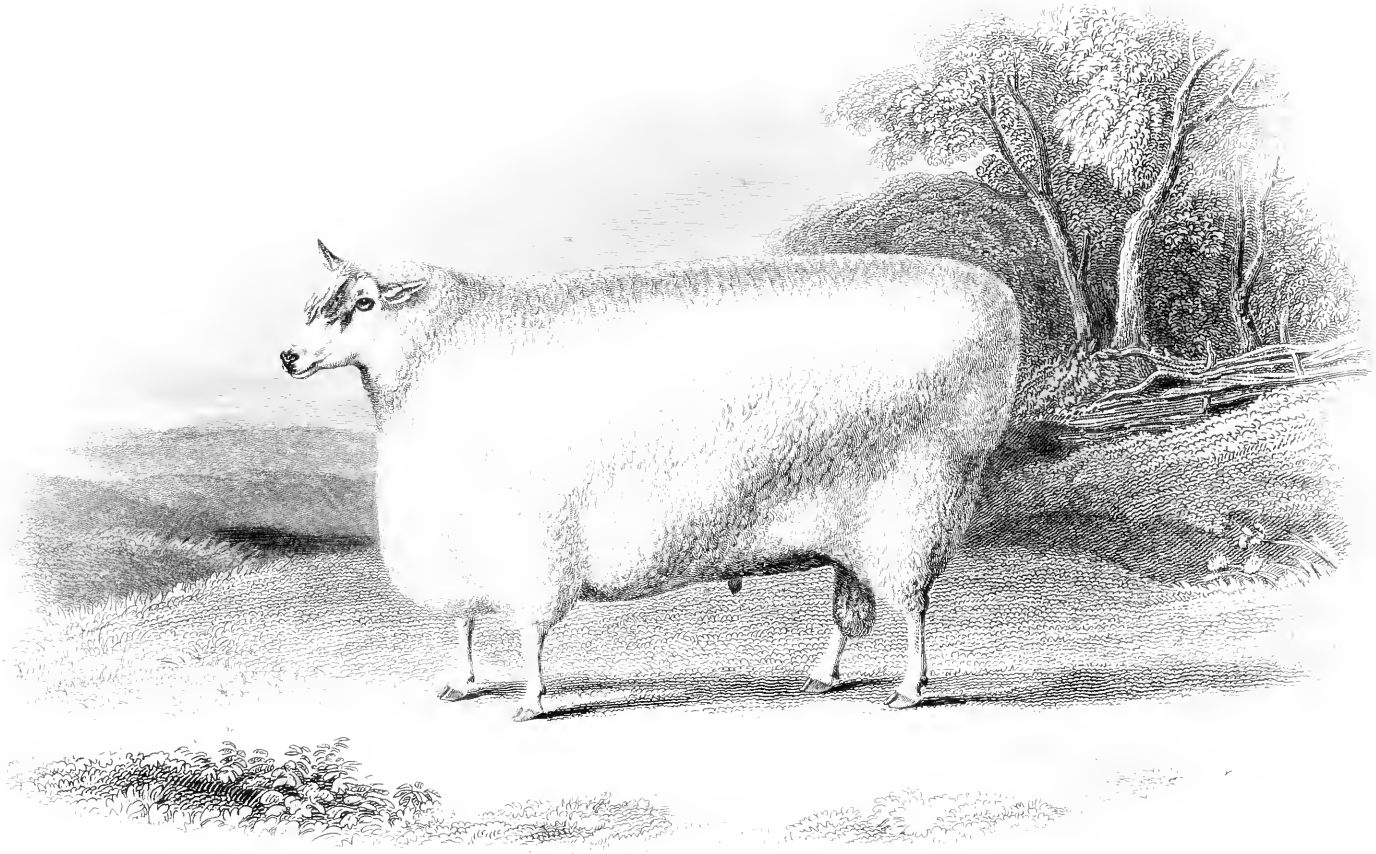
THE EMBELLISHMENTS



THE FARMER'S MAGAZINE.

JULY, 1853.

PLATE I.

"YOUNG BOXER."—A SUFFOLK STALLION,

THE PROPERTY OF WILLIAM STEARN, ESQ., OF ELMSETT HALL, NEAR HADLEIGH, SUFFOLK,

For which the first prize of Thirty Sovereigns was awarded at the meeting of the Royal Agricultural Society of England, held at Lewes, in July, 1852.

"Young Boxer" took the first prize in the three-year-old class in September, 1852, at the show of the Framlingham Agricultural Association; and at the Hadleigh Farmer's Club show, in May, 1853, he obtained the first prize as the best animal exhibited. We understand that his "get" are growing up very promising.

PLATE II.

A LONG-WOOLLED SHEARLING RAM,

THE PROPERTY OF MR. WM. LANE, OF EASTRINGTON, NEAR NORTHLEACH, GLOUCESTERSHIRE,

For which the first prize of Twenty Sovereigns was awarded at the meeting of the Royal Agricultural Society of England, at Lewes, in 1852.

METEOROLOGY—ITS CONNECTION WITH THE CULTIVATION OF THE SOIL.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

In some previous pages of this valuable magazine, when treating of certain meteorological observations, I chiefly addressed my observations to the moisture of our climate, and the effect of that varying moisture upon the vegetable productions of the earth. Another great and very influencing portion of the enquiry, which requires our attention, is the effect of temperature on the labours of the cultivator.

In our previous examinations of the aqueous depositions of different districts, commencing our researches about the centre of the southern shore of England, to which I have just alluded, we imagined the case of a stranger first landing at Southampton, and traversing the island in various northern and southern lines as nearly direct as possible, and in several cross lines from west to east. I propose in this section to follow the same course, in my inquiries as to the temperature of different districts of the kingdom, and to note the results of observations made in the same years to which our preceding enquiries were directed.

The traveller who had been already engaged in continental meteorological observations, would from such previous studies, perhaps, land on our shores prepared to attribute more influence to the different mean temperatures of its districts, than the result of his observations would eventually justify. His remarks made in traversing the continents of the old world would naturally give him this impression; he would come rather unprepared to make

adequate allowances for the insular position or the temperate latitude in which our favoured country is placed; his previous studies would be confined to countries where the transitions of the climate are more marked, the equalizing effect of extensive seas less, the effect of considerable elevations much more apparent. Such previous examinations, however, would qualify him much better in some respects for the examination than if an Englishman commenced the task, unaided by the continental observations to which I have alluded. Let us then endeavour to participate in these advantages of the continental meteorologists by taking a rapid glance of the phenomena to which I have alluded. Such an examination too may have several indirect, yet very useful results: it may serve to prove to the English farmer that difficulties and doubt, in all climates, more or less attend the labours of the cultivators of the earth. The careful study of only a few of the many important facts collected long since by M. Mirbel, recently by M. Gasparin, and so ably illustrated by Lord Lovelace (*Jour. R.A.S.*, vol. ix, p. 314), prove the truth of this position. In the northern part of Asia, as M. Mirbel remarked, vegetation differs but slightly from that of our own country. we meet with the same genera, and similar types prevail. But in the southern parts the character of the country is changed: without water, and swept by scorching winds, the drought is extreme; the carpet of soft verdure, and the refreshing shade of its northern countries and of Europe, are looked for in vain. It is a fact as notorious as surprising, that no one vegetable belonging to the countries towards the southern pole produces a single fruit for the food of man. There are divers conditions without which the growth of the different species cannot proceed. An uninterrupted heat is required for some—a moment's decrease in it, is fatal to them; others withstand a considerable degree of cold, while their sap is quiescent, but want a high degree of heat when that sap is once in motion; some like a moderate temperature, and dread equally the excess of both heat and cold. It is upon the observation of such appearances, that the cultivator grounds his practice. He knows that it would be in vain for him to attempt to grow, without shelter, either the date or the orange, beyond the 43rd degree of northern latitude; that the olive will thrive a little further north; that the vine is barren out of the latitude of 50 degrees, or at least never brings its grapes to perfection. He is cautious of exposing to a southern aspect the species whose sap is readily set in motion by the first gleam of warmth; he knows that late frosts destroy them—witness the vineyards around Paris; the plantations there, which escape the injuries of frost, are not those which look towards the south, but those which face the north. The sap of the latter is set in motion late, and when the heat reaches them, the season is already settled, and no risk is incurred from the inroad of cold. Local circumstances, as I have before remarked—such as the elevation of the place, its aspect, the nature as well as the inclination of its soil, the proximity of mountains, of forests, of the sea, &c.—are all causes of variation of temperature, and must each be attended to, in accounting for the vegetation of any particular district. For instance, the winter is less severe on the northern coasts of France than in the interior on the same level, an effect of the vicinity of the ocean. The sea preserves a far more even temperature than the atmosphere, and is constantly at work to maintain some degree of equilibrium in the warmth of the air. In summer it carries off the caloric, in the winter it gives back a portion of that which it contains. It is thus that the mass of water held in the vast basin of the ocean tempers on its shores the heat of summer and the cold of winter. For this reason, in Devonshire and on the coast of Calvados, the myrtle, pomegranate, Indian rose, and a swarm of other exotic plants, grow in the open air; but in the interior of England and France require shelter. The same cause permits the cultivation of many species in the open ground around London, that near Paris will not thrive out of the greenhouse. So that, as Lord Lovelace remarks, all careful observations show that if each division of the earth's surface be reversed, what appears at first sight to be peculiar advantages, they are for the most part modified by such circumstances as re-establish something like an equality of condition with our own. Even within the cereal zone, that is, that which enjoys greater stability of seasons than those of the vine and olive lands, there are greater vicissitudes of heat and moisture than in England. Take, for instance, the occurrence of hoar frosts, so destructive in their effects on our early garden produce in the spring. The mean number of these at Orange is 17.7; while at Rome, where they have been known to occur in June, it is 63.8. The buds of vines and mulberries are destroyed by them as frequently as our peach blossoms in England. In Italy, a district around Otranto is ironically called "the land of flowers," since the recurrence of these visitations so frequently prevents their being succeeded by fruit. Let us then feel assured, that there is no portion of the earth so happily placed as not to be dependent upon uncertain seasons, and widely varying changes of temperature; and moreover, far from regarding these things as evils, let us rather consider them as fortunate circumstances for our happiness. The English farmer who explores other lands will speedily be convinced of

this. He will see that mental exertion, and the active enjoyment of health, are commonly found in the least proportion where the soil is the most naturally fertile, the climate the most serene, and the seasons the most regular; and that it is only in a varying, temperate climate like our own, that exertions are called forth—the employment of patient thought the most amply rewarded.

The traveller, who has directed his course from the equator towards the poles, notices the gradual change which takes place in the natural productions of the land, and the different objects of the cultivator's care. Leaving the maize and rice fields of Asia, he arrives at a temperate zone where the husbandman directs his attention to wheat and barley; then as he still follows a northerly course, he finds these gradually supplanted [by oats and rye, which disappear in their turn as he approaches nearer and nearer to the region of perpetual snow.

Such an explorer also notices, that in all quarters of the earth, at some elevation or other, this snow line is met with. If the line is on the surface of the earth at the poles, it is yet encountered at great elevations even in the torrid zone. For instance, the line of perpetual snow is found, according to Humboldt, (*Aspects of Nature*, vol. i. p. 99,) on the northern sides of the Himalaya chain, at about 16,600 feet above the level of the ocean. In ascending from the level of the sea to heights like these, even in the warmest countries of the world, the voyager sees changes in the vegetation as he proceeds, similar to those which he notices in traversing the space between the equatorial and arctic regions: with this distinction that the change in the first instance is far more rapid than in the slower transitions of the far longer voyage towards the north. Otherwise the height of 12,000 or 15,000 feet in the warmest portions of the globe produces changes in the vegetation indigenous to the soil as marked, as in the thousands of miles which intervene between the equator and the polar regions. It has been calculated that, in general, a degree of latitude affects the mean temperature in the proportion of about 600 feet of elevation. Many great naturalists have noticed this progression. Thus Tourneforte at the foot of Mount Ararat, after observing the plants of Armenia, found, as he ascended, first the flora of Italy and France, further on those of Sweden, whilst those of Lapland covered its summits. Linnæus was well aware of these things: he remarked, "The different kinds of plants show by their station the perpendicular height of the land."

The plants which are the objects of agriculture are materially influenced by the climate of different altitudes, even in the level land of England. The potato, which grows in our climate at all our small elevations, is cultivated in Chili as high as between 10,000 and 11,000 feet above the sea. Rye is grown in France, particularly in Provence, as high as more than 6,000 feet; wheat at about 5,500 feet; barley, which grows only in temperate climates, will not succeed under the tropics at a lower elevation than 3,000 or 4,000 feet. It is cultivated in Thibet, according to Humboldt, at very extraordinary elevations. Fields of barley, (*Hordeum hexastichon*) he says, (*Aspects of Nature*, by Sabine, vol. i., p. 99) are seen in Runawar up to 14,077 feet, and another variety called ood, even much higher. Wheat, he adds, succeeds extremely well in the Thibettian highlands up to 12,022 feet. From the observations made in Saxony, Schubler drew the conclusion that every 98.26 feet of elevation caused a delay in the wheat and barley harvest of two days. In our climate, all other things being the same, we think that nearly a similar rate of retardation is observable; but here, again, many circumstances cause a deviation from the rule—such as the nature of the soil and subsoil, and the more or less rapid *rate* of elevation. The harvests on gravelly or siliceous soils are much earlier, and on clay soils much later, than these calculations would justify. The harvests, for instance, on the gritstone or moorlands of Yorkshire, at an elevation of 500 feet above the level of the sea, are always later than on its chalk wolds at 800 feet. We may, perhaps, take it as a general rule, that all lands in England, at an elevation of 1000 feet above the sea, can only be profitably employed as pastures. The line of extreme cultivation, we have seen rises gradually as we approach the equator. The height of our highest mountains is only about a third that at which barley is cultivated in the Himalaya Chain. Helvellyn is 3,055 feet, Ben Macdue 4,148 feet, Macgillicuddy, in Ireland, 3,410 feet.

The result of Mr. Kirwan's observations was, that in moderate rates of elevation above the level of the sea, such as at the rate of six feet per mile for every 200 feet of elevation, the mean annual temperature would be reduced a quarter of a degree; that if the rate of elevation was 7 feet per mile, one-third of a degree must be allowed; for 13 feet, four-tenths of a degree, and if at the rate of 15 feet or upwards, then half a degree must be allowed.

The mean decrease of temperature observed on an average of five aërial voyages (including the celebrated ascent of Gay-Lussac to the height of 22,632 feet) has been 1 deg. Fahr. for every 360 feet. In the south of Germany and in Italy, it is 1 in 310 feet; in the United States, 1 in 404; in Siberia, 1 in 440. The *mean temperature* of the locality of course is materially influenced by these circumstances. The following is the mean tempe-

rature of different places (*Lord Lovelace, Jour. R. A. S.*, vol. ix., p. 317):—

Lat. Deg.	Lat. Min.	Place	Mean Temp.	Do of Summer.	Do of Winter
51	31	London..	50.72	62.78	39.56
48	50	Paris ..	51.44	64.58	37.94
50	78	Penzance	51.98	61.70	43.88
48	19	Munich..	48.02	63.32	31.28
48	23	Vienna...	50.18	68.24	32.36
39	55	Pekin ..	54.86	82.58	26.24

Let us now, however, revert to the different records of the English stations, which we before visited in our enquiries as to the rain fall in different portions of England.

In traversing the southern coast of England, from Truro to Exeter, and thence to Chichester and Uckfield, the following was the mean, and the highest and the lowest temperature in the year 1847, and in the quarters of the year 1848:—

	1847.	1848. Mean Temperature of Quarters ending			
		March 31.	June 30.	Sept. 30.	Dec. 31.
Truro	49.9	40.2	52.1	57.3	47.7
Exeter	49.5	40.5	56.3	58.6	46.6
Chichester	47.8	38.7	52.6	55.9	44.2
Uckfield	49.2	39.7	55.9	59.6	

Highest and Lowest Temperature.

	highest	lowest	highest	lowest	highest	lowest	highest	lowest	highest	lowest
Truro	730.	27.0	56.0	26.0	70.0	35.0	72.0	42.6	66.0	32.0
Exeter	75.5	18.0	19.0	11.0	77.5	30.0	80.7	39.0	69.0	24.2
Chichester	82.6	18.0	13.0	10.9	77.0	30.0	78.0	39.0	67.0	25.0
Uckfield	98.0	1.0	67.0	11.5	82.0	29.0	83.0	36.0		

In taking a west and eastern line, about one degree to the north of the last southern line, we have the records of the temperature of Beckington and Greenwich; these were in the year 1847, as follows:

	1847.	1848. Mean Temperature of Quarters ending			
	Mean.	March 31.	June 30.	Sept. 30.	Dec. 31.
Beckington	45.2	38.6	53.1	57.1	43.2
Greenwich	49.7	39.5	54.3	58.6	45.9

Highest and Lowest Temperature.

	highest	lowest	highest	lowest	highest	lowest	highest	lowest	highest	lowest
Beckington	88.0	5.0	70.0	19.0	83.0	24.0	88.0	32.8	72.0	21.0
Greenwich	86.0	10.2	71.5	15.8	80.0	30.2	85.3	35.8	74.0	21.8

Taking the same course from west to east in a more northerly direction, we have, for comparison, the records of Liverpool, Derby, and Highfield, in Nottinghamshire. The following are extracts from their registers:—

	1847.	1848. Mean Temperature in the Quarters ending			
		March 31.	June 30.	Sept. 30.	Dec. 31.
Liverpool	49.6	41.2	52.2	56.3	45.3
Derby	47.2	88.6	52.5	55.7	43.6
Highfield	49.3	39.8	53.7	57.2	44.6

Highest and Lowest Temperature.

	highest	lowest	highest	lowest	highest	lowest	highest	lowest	highest	lowest
Liverpool	76.8	26.8	54.5	20.7	71.9	34.7	76.8	45.2	67.8	29.4
Derby	81		61.0	11.0	77.0	26.0	81.0	35.0	68.0	23.0
Highfield	88.0	20.0	69.8	16.0	83.0	27.0	84.8	37.2	71.0	22.7

Having examined the temperature of the island, in a west and east direction, on its southern side, and in two others more midland, we next take the same direction more towards the borders of England and Scotland; here we have the registers of Whitehaven on the west, and Durham and Newcastle on the east.

	1847.	1848. Mean Temperature in the Quarters ending			
		March 31.	June 30.	Sept. 30.	Dec. 31.
Whitehaven	47.6	40.1	52.2	57.2	62.5
Durham	45.5	37.6	50.7	54.7	69.6
Newcastle	44.8	38.6	50.6	56.8	68

Highest and Lowest Temperature.

	highest	lowest	highest	lowest	highest	lowest	highest	lowest	highest	lowest
Whitehaven	79.0	24.5	55.5	15.0	73.0	31.0	72.0	38.5	62.5	27.0
Durham	83.2	17.2	57.2	3.8	76.4	24.5	79.6	34.8	69.6	21.4
Newcastle	77.0	21.0	58.5	9.5	79.5	26.5	79.5	34.5	68.0	25.0

If we examine the mean, and the highest and lowest temperature in a southerly and northerly direction, keeping first on the west side of the island and then on its more eastern side, we have the following results :—

1. ON THE WESTERN SIDE.

	1847.	1848. Mean Temperature in the Quarters ending			
	Mean.	March 31.	June 30.	Sept. 30.	Dec. 31.
Truro	49.9	40.2	52.1	57.3	47.7
Exeter	49.5	40.5	56.3	58.6	46.6
Beckington	45.2	38.6	53.1	57.1	43.2
Derby	47.2	38.6	52.5	55.7	43.6
Liverpool	49.6	41.2	52.2	56.3	45.3
Whitehaven	47.6	40.1	52.2	57.2	62.5

Highest and Lowest Temperature.

	highest	lowest	highest	lowest	highest	lowes t	highest	lowest	highest	lowest
Truro	73.0	27.0	56.0	26.0	70.0	35.0	72.0	42.0	66.0	32.0
Exeter	75.5	18.0	19.0	11.0	77.5	30.0	80.7	39.0	69.0	24.2
Beckington			70.0	19.0	83.0	24.0	88.0	32.8	72.0	21.0
Derby	81.		61.	11.	77.0	26.0	81.0	35.0	58.0	23.0
Liverpool	76.0	26.8	54.5	20.7	71.9	34.7	76.8	45.2	67.8	29.4
Whitehaven	79.0	24.5	55.5	15.0	73.0	31.0	72.0	38.5	62.5	27.0

2. ON THE EASTERN SIDE.

	1847.	1848. Mean Temperature in Quarters ending			
	Mean.	March 31.	June 30.	Sept. 30.	Dec. 31.
Uckfield	49.2	39.7	55.9	59.6	
Greenwich	49.7	39.5	54.3	58.6	45·9
Cambridge	48.7		53.6		
Durham	45.5	37.6	50.7	54.7	69.6
Newcastle	44.8	38.6	50.6	56.8	68.

Highest and Lowest Temperature.

	highest	lowest	highest	lowest	highest	lowest	highest	lowest	highest	lowest
Uckfield	98.0	1.0	11.	11.	82.0	29.0	83.0	36.0		
Greenwich	86.	10·2	71.5	15.8	80.0	30.2	85.3	35.8	74.0	21.8
Cambridge	86.7	18.7			79.5	30.7				
Durham	83.17	17·2	57·2	3.8	76.4	24.5	79.6	34.8	69.6	21.4
Newcastle	77.0	21.0	58.5	9.5	79.5	26.5	79.5	34.5	68.0	25.0

The mean temperature, then, of the months of June, July, and August, at Chiswick mean of 20 years, London and Thetford, in 1844 and 1845 (corn-growing districts), and of Exeter, Liverpool, and Kendal (pasturage localities) was as follows :—

	Exeter	Liverpool	Kendal	Mean of 3 stations	Chiswick	London	Thetford	Mean of 3 stations
June	60.0	59.1	56.2	58.4	60.8	66.0	68.7	65.1
July	60.3	61.0	57.1	59.4	63.1	62.0	65.7	63.6
August	57.7	58.1	54.5	56.7	62.3	60.5	60.5	61.1

Thus the mean temperature of even Exeter, in the month of June, was 5.7 less than that of Thetford, in July 5.7, and in August 3.2 less. At all the three western stations, the mean temperature during these three months was considerably less in these grass-growing districts than in the corn-producing neighbourhoods of Chiswick, London, and Thetford.

The mean temperature of different portions of our island, then, is a more material influencing cause of the success or failure of different systems, than the farmer commonly understands; and in studying the recorded observations of the meteorologist, even the man of science is frequently made acquainted with facts rather opposed to popular conclusions.

NATURAL VEGETATION AND GEOLOGICAL STRUCTURE A GUIDE TO THE QUALITY OF THE SOIL, AND THE AGRICULTURAL CAPABILITIES OF LAND.

Enough is known respecting the relations subsisting between the natural vegetation and the composition of the soil, to render it certain that it may be made a useful auxiliary in judging of the quality of land. In order, however, to secure the full value derivable from this source, more accurate and extended observations are required than those which we possess at present; and to confer general benefit, it is necessary that those who describe plants as characteristic of certain soils, should all speak the same language.

Objections have frequently been raised against the Latin names of plants employed by botanists, who have been charged with using them for the purpose of increasing their own importance by rendering botanical knowledge difficult of access. It may render it difficult to some; but the fact is, that its object is the diffusion of knowledge. Scientific terms are expressed in Latin and Greek because, for one reason, those languages are generally understood by the educated classes of all countries. An educated Frenchman, German, Italian, or Russian would know at once what plants were meant, if told that *Echium vulgare* and *Carduus nutans* are characteristic of poor silicious soils; though they would not understand what was intended if the English names viper's-bugloss, and musk-thistle were used. It might be practicable to establish a system of English scientific names in botany, for the benefit of English ladies, English farmers, gardeners, and agricultural labourers; but many ladies overcome the difficulties of the Latin terms, and so do many gardeners. There appears no legitimate reason why the owners of the soil, and the land agents and valuers whom they employ, should not be able to do the same. We greatly doubt, moreover, whether the agricultural class would be more disposed to relinquish their local names of plants for a systematic English than for a systematic Latin nomenclature.

The necessity for some general botanic nomenclature among agriculturists is strikingly exemplified by one of the papers on the characteristics of fertility and barrenness, in the Journal of the Royal Agricultural Society—that by Mr. Askell—in which some really good observations are deprived of their value, by being rendered unintelligible to those readers who are ignorant of the plants which are described under their local names of woodwax, moons, five-leaves, hardheads, and carnation grass. Mr. Bravender in his prize essay gives the botanical, as well as the local, names of the plants to which he refers. He says, that after he had resolved to follow out a series of observations on the quality of the vegetation on all the lands which he should have occasion to visit, he found that he could make no progress till he had applied himself to the study of geology and botany. He admits that time and labour are necessary to acquire a sufficient knowledge of these sciences—a difficulty which we think he rather overrates—to be used as tests of the quality of land; but he observes that this only shows the absurdity of calling in the assistance of persons who have never spent five minutes of their lives in the practical study of either.

We agree with him that the natural vegetation is more to be relied on as a guide to the quality of the soil, upon pasture than upon arable land. Upon the former, he considers it the most certain guide of all; and he proposes to render it more definite by adding a description of the prevalent grasses and other plants of which the herbage is composed to such notes as the following, which are usually made by valuers: "Herbage of bad quality;" "Herbage short, but thick at the bottom;" "Herbage coarse, sour, and peaty." There are some species which occupy the ground, to the almost total exclusion of others, upon barren soils, and which disappear before manuring, draining, and other improvements, giving place to those which are the prevailing plants in pastures of great natural fertility. There is another test, however, which he proposes to apply, besides that of the species of which the sward is composed, and that is the number of plants growing upon a square foot. Of the species of

grasses indigenous to Britain, about 150 in number, there are about twenty which appear to be the best, and which are nearly all present in fertile meadows, in greater or less proportion. None of these are so productive, when cultivated alone, as when associated with others. There are other inferior grasses, the presence of which in small proportions is by no means disadvantageous, as they fill up vacancies between the stems of the better sorts, or come to perfection at a different season. With regard to the number of plants present in a given area of sward, it has been observed that on the best natural meadows it amounts to 1100 on a square foot, which in water meadows is increased to 1800; while a square foot of arable land laid down with seeds contains no more than 80. An old pasture may be considered poor, says Mr. Bravender, which does not produce as much fodder as a piece of seeds of the second year. On arable land the natural vegetation is of less value as a criterion of the quality of the soil, because such land produces, or ought to produce, nothing but what the farmer has placed there. Recourse must therefore be had to the natural vegetation of the borders of the fields, or of adjoining uncultivated land—to the free or stunted growth of the white-thorn and other fence plants, and of the hedgerow timber. Timber trees, however, indicate, in our opinion, rather the nature of the subsoil and substrata, than of the soil, and are only useful guides, so far as these influence the quality of the land. But though the natural vegetation is taken for a guide with less confidence on arable than on pasture land, the stunted or luxuriant growth of many of the common weeds of the farm, which grow indifferently on good and bad soils, furnish reliable indications of the condition of the land dependent on cultivation, as also of its intrinsic quality. There are a few with which, when they appear in vast quantities, the cultivated crops struggle with difficulty on even well managed land. Such plants are signs of the deficiency or excess in the soil of certain constituents, as sure as can be derived from chemical analysis, and perhaps more so, in consequence of the difficulty of selecting a sample of soil for analysis which shall represent the average of an entire field.

When land, for instance, on the sands and sandy loams of Norfolk, is much given to *Chrysanthemum segetum*, or corn marygold, it is held to be an infallible sign that it requires chalking, called there claying and marling; while an abundance of red poppy, *Papaver rhœas*, is an indication equally certain that it has been over chalked. There are others again, as *Potentilla anserina* and Leopard's Bane (*Doronicum pardialianthes*), which indicate an excess of deleterious salts of iron in poor wet clays. The family of rushes (*juncus*), with coltsfoot (*Tussilago farfara*) and *marestails* and *horsetails* (*Hippuris vulgaris*) and (*Equisetum arvense*) are universally held to indicate an excess of moisture and the presence of springs. There are many other plants, from the presence, or rather prevalence of which, observation, aided by analysis of their ashes might draw much valuable information respecting the defects of the soil, and the substances required to correct them.

In judging of the agricultural capabilities of land in an old country, the indications afforded by the, natural vegetation and geological structure ought to go hand in hand. In a new country they are companions which cannot be divided. If either is to be adopted alone, it should be geological structure; because its indications are the same in all parts of the world, whereas the character of the vegetation varies with the climate, and till the settler has acquired experience of the sort of land indicated by the presence of the different members of the new flora, he is often extremely puzzled as to the soils of which the strange plants are characteristic, which meet him at every turn. Some interesting facts, bearing on the relations between the natural vegetation and the quality of the soil, are scattered through Professor Johnston's Notes on North America. The undulating upper portion of the Valley of the Hudson contains much strong yellow clay, part of a wide-spread, erratic, tertiary deposit, which borders Lake Champlin, where it is 100 feet thick, and extends thence north and east, along the banks of the St. Lawrence. It consists, in the under part, of a stiff clay, resting upon rocks with polished and grooved surfaces, which geologists now very generally refer to the former action of ice, in part terrestrial, in part marine. Above this is a light-coloured clay, containing shells of existing species, and over all a bed of yellow sand, sometimes loamy and fertile, but often barren and covered with stunted pines. The soils vary, as this upper sand remains at the surface, or has been removed by natural causes. The stiff clay produces in its unreclaimed state a native growth of hard-wood trees; but when cleared and under crop, it is apt to crack and harden in dry weather. The sandy loams which rest on the clays form broad pine barrens, in which the white pine prevails; while the sands and more sandy loams are covered with the yellow pine. Contrary to what might have been anticipated, it is found that when brought into cultivation, the loamy sands suffer less from the effects of heat than the stiff clays; but that the apparently purer sands bear the drought better than either. This is attributed by Professor Johnston to their greater porosity, and consequent superior capability of absorbing moisture from the air. To this absorption from the air he also ascribe

the known fact that stiff clays which have been drained are really moister in summer, than the same description of land undrained. This is one, but not the only reason. Undrained clays are like a turnpike road, mud on the surface in wet weather, but at a certain depth impervious to rain, which runs off them, carrying the manure away with it into the ditches and brooks. Into drained clays, on the contrary, rendered porous by the process, the rain penetrates, with all its fertilizing accompaniments, to the depth of three or four feet. When saturated with moisture, it discharges the superfluity into the drains, as from a dripping sponge; and in summer it becomes, as it were, a damp sponge, retaining moisture by capillary attraction.

The butter-nut, *Juglans cinerea*, so valuable for its oily nut, delights in a calcareous soil, and is held to be indicative of a good wheat soil, wherever it occurs in abundance and luxuriant growth. It is not known in the woods of Nova Scotia, and is only found in New Brunswick in particular places. It has there given the name of Butternut Ridge to a thriving settlement on a ridge sloping gently to the west, and composed of thick-bedded hard blue limestone, which in many spots comes to the surface, and over a large extent of the slope is covered only by a thin soil. Here in its state of wilderness the butternut flourished, and attracted the early settlers as a sign of fertility.

These may be considered rules: let us now look at the exceptions. The presence of hard wood, as the broad-leaved timber trees are called, is deemed in North America a sign that the soil is sufficiently argillaceous to constitute good wheat land. This test, however, fails in the case of a second growth, which springs up after one of those fires which devastate extensive tracts of the forest. Under such circumstances, an interchange of vegetation takes place between the soils. Hard wood, consisting chiefly of poplar and birch, with a sprinkling of maple, takes the place of the pines, which then grow almost alone on the ridges formerly occupied by hard wood. This rotation in nature's cropping is always attended to by those who explore the woods for the purpose of ascertaining the agricultural capabilities of different portions of them; and they are able easily to discover the difference between a first and second growth by means of a few large trees which show that some considerable time must have elapsed since a general destruction of the forest. Changes in the vegetation on the same soil are not confined to the timber trees. *Epilobium coloratum* and *Enchitites hieracifolium* have acquired the names of fire weeds, from their rising abundantly upon cleared land, which has been neglected in the spring, after the timber tree has been burned. When the land, however, is ploughed, they disappear, and are replaced by the Canada thistle and hemp nettle, which become troublesome weeds. The Canada thistle is not indigenous, but is the *enicus arvensis*, or thistle with a creeping root, which is the pest of the slovenly farmers of the Old World—a pest which they do not believe to be propagated by seeds, but bred by their land in common with many other weeds. To the same class of farmers, it forms an equally troublesome pest in the New World, where it has found a congenial home and a congenial state of husbandry, spreading with such rapidity, and taking such tenacious hold of the soil, wherever it establishes itself, as to have acquired the name of the "accursed thistle." The artillery of legislation has been brought to bear on it, in the form of an "Act to prevent the growth of thistle," which was passed by the legislature of New Brunswick with no better success than usually attends interference with such matters by Acts of Parliament. The thistle has spread, apparently in defiance of the Act, and has given increased annoyance even in the county of Gloucester, for whose special benefit the enactment was designed. Nothing, in fact, can arrest its growth, but the general spread of clean farming. Individual exertions can do but little. Of what avail is it that one man extirpates his own thistles, if liable to the invasion of a host of winged immigrants from his neighbours? It is a curious fact that in North America the European weeds are generally superseding those which are indigenous to the soil, particularly along the Atlantic coasts and the river borders. The common plantain (*Plantago major*) is called by the natives the white man's foot, whose steps it follows; and even the plants growing by the road side are, according to Agassiz, all exotics; everywhere on the track of the white man, the native weeds disappearing before him like the Indian.

The *Lithospermum arvense*, corn-gromwell or stone-weed, is a European importation, brought in probably with some foul seed wheat, from France, Germany, or England, which has spread with a rapidity equal to that of the "accursed thistle". In districts where it was unknown thirty years ago, it has now become nearly lord of the soil. Its seeds are purchased at the oil mills of Yates county at the rate of hundreds of bushels, and would be bought at the rate of thousands, if the price were 8s. a bushel instead of 1s. 6d. The purpose to which it is applied is the adulteration of oilcake for the benefit of unwary purchasers in England. The rapidity with which this weed spreads arises out of several causes—the hardness of the seed, enabling it to pass uninjured through the stomach of an ox and even the gizzard of a bird; and the facts of its

growing but slowly in the spring and pushing up rapidly in the autumn, so as to receive little check from spring ploughing, while its roots, which spread only on its surface, exhaust the nourishment which should be supplied to the wheat—these natural qualifications for rapid colonization are aided by the prevalent rude system of farming, which, raising wheat year after year on the same land without attempting to clean it, allows the pigeon weed, as it is called in America, to grow and ripen with the wheat, and to seed the ground more thickly with every crop.

REMOVAL OF FENCES ON LIGHT LAND.

The removal of fences, now so generally recommended, and so universally adopted in a greater or less degree, is having one unlooked-for effect on certain soils. There need be no dispute as to the advantage of a free circulation of air, both as regards the growth, ripening, and drying of field crops; nor any as to the advantage of rapid drying of soils holding much water by capillary attraction, so avoiding the starving effects of great and long-continued evaporation. Nor can there be any doubt but that shelter from cold by fences in general is more made of, and more valued than perhaps it has any business to be considered. We have certainly seen instances where, from elevation, or exposure to sea blasts, we thought a fence a great protection; and have always considered that certain farms, denuded of fences, lying high, and not far from the east coast, whose owners we will not name, were really injured by taking away the fences, because we saw far better crops as far as the shelter of the eastern fences extended.

But what we wish particularly to allude to is, the *increased effect of wind on blowing sand* where the fences have been removed. In fields not over large, and well protected in some districts by good thorn fences, we see certain parts blown away, as it were, by high winds, after the sowing of a crop, and especially after rolling. We have seen turnips, for instance, absolutely blown away by a wind in July, on all parts of a field not under the influence of the shady fence. We have witnessed a torrent of sand cut off, as completely as if the scythe had been at work, the most promising crop of barley for one-third of a field, while under the hedge it remained unmolested; and we have seen sand, with grass-seeds and all, absolutely drifted like snow, when the wind caught it newly rolled, and thus the field was denuded of its soil, blowing away in clouds of dust-like particles.

Now, while we do not say that these fences should not be removed, we do most decidedly urge upon the improver the necessity of doing what an interest not so powerful, ere this, ought perhaps to have suggested—viz., the improving the mechanical constitution of the soil. Sheep-treading will do much to consolidate a soil; if oil-cake is given to the animals, it will do more; but these are only temporary and evanescent ameliorants to the soil; the substratum of real consolidation exists in *the application of clay or marl.* That this will pay, as a permanent improvement, perhaps, as well as drainage, or any similar process, we can have no doubt.

We have in our mind's eye at this moment a case where a farm of moory land, but not high-lying, was purchased, including an excellent house, for about fifteen pounds per acre. The soil was a white, gritty sand, full of land springs; the surface had once been peat, but the poverty of the tenantry had induced them to pare off the peat from a great part of it, and thus it was left barren white sand to the top. Furze and rushes, with a little heath, was almost the entire produce of the land. The owner drained, at a cost of about three pounds ten shillings per acre, and clayed the whole, by digging ponds, at the rate of 200 loads per acre, or about five pounds more, and then sowed turnips and seeds, followed by wheat. The result was most successful, and the farm is now in good cultivation, and let, we should say, for 20s. per acre. We do not happen to know the exact rental, but it strikes us as being the probable amount. But more; the fences had been planted and died. The owner immediately renewed them by re-planting, manuring the quicksets with clay. They grew amazingly, and are now remarkably healthy and good fences.

Mr. Gould's experience with sixty acres of light moorland, as detailed in the *Transactions of the Bath and West of England Agricultural Society,* bear strongly upon the point. He took the waste on a lease, pared and burned, and, in sinking a well, happened to take out some clay, which he carted into his eleven acre enclosure. The result was that his subsequent crop of oats shewed a produce of 50 bushels per acre, and his unclayed not more than 30 bushels. The subsequent grass or clover on the clayed part was excellent, while not a plant grew on the unclayed. He then clayed the whole of the 60 acres at intervals, and in 16 years had applied 80 loads per acre—twice, forty—and the result has been most

satisfactory in the whole, being rendered capable of growing good crops of corn, turnips, and grass, and is carried on in the four-course system.

Now, we would strongly urge that where fences are removed on light lands, provision should also be made for simultaneously providing for the application of marl or clay in such quantities as the exigencies of the case may require. In some cases 20, in others as many as 200 loads per acre will be found successful; the coarser and more gritty the sand the greater the application required.

The autumn is by far the best season for this purpose, as the teams are then usually not very much occupied, and the effect of winter frost is to pulverize and commingle the clay in a manner which hardly any other process, even a summer fallow, can accomplish so effectually; when pulverized or fallen, it is useful to harrow the clay before ploughing it in, as a better mixture is thus obtained. Where time is of minor consequence, the application may be made at twice—one-half the intended quantity being applied at each dressing—but when it is, the whole may be applied at once. If there is any doubt as to the precise quantity required, the double application will be most advisable.

RELATIVE MERITS OF FIXED AND PORTABLE STEAM-ENGINES FOR THE BUSINESS OF THE FARM.

The discussion with which the Farmers' Club has just closed its spring or summer meetings could not have been better timed. It comes as an appropriate prologue to the Gloucester and other exhibitions which will successively follow. Introduced, too, as the subject was, by one of the most popular amongst the manufacturers of agricultural implements, the report can scarcely fail to command attention and result in advantage. The tenant farmers will of course be inclined to test the advice offered them after their own fashion, and that by no means a bad one. They will apply it to their own position, and then determine how far what they hear is either practical, or suitable to the circumstances under which they are placed.

They did so, in fact, at the meeting in question. The point for consideration was the relative merits of fixed and portable steam engines for the business of the farm. Mr. Ransome's own leaning, as gathered from his opening address, and the resolution with which he closed his reply, was evidently in favour of the fixed power. He argued, however, with that fairness and ability for which he is so deservedly distinguished; while he said so much on both sides, and what he did say was so much to the purpose, that we cannot hesitate to let the case of either of the parties concerned stand in his own words.

"On the one hand," as he states, "there is in favour of the fixed engine greater economy in first cost, greater durability, less liability to hindrance from stoppage for repairs, less annual cost for repairs, and less ability and attention required to make it work to its fullest advantage. And where the arrangements upon a farm admit of such concentration as to permit its general employment in thrashing the crop, grinding the corn, cutting the chaff, steaming food for cattle, or sawing wood at one homestead, there is not a question but that a fixed engine would be greatly preferable."

While, again,

"On the other hand, it may be urged in favour of the portable engine, that on large farms, and, indeed, on most farms of such extent as would require a steam engine of any kind, a large portion of the crop may advantageously be stored at other parts of the occupation than the homestead; that by means of portable engines, the crops may often be advantageously thrashed directly from the stack, and the expense of removing into the barn altogether avoided, and doubtless, where the straw may be made use of in the near neighbourhood of a distant yard, this is a great advantage. It is also an argument justly used in favour of portable engines, that inasmuch as on most farms there could scarcely be found full employment for a steam engine, the use of the portable engine might be shared by two or three others residing in the locality. The advantage resulting from a compact arrangement of machinery at the homestead is not necessarily confined to the fixed engine: the same arrangements, the same line of shafting, and the same separate machines may be placed as readily to be driven by the portable machine whenever it is brought to a given spot as by the fixed engine placed permanently there."

The superiority, the very use in fact of the fixed engine, rests simply on the assumption of one grand point to begin with: it is, that the farmer's friend is now so continually impressing upon him. Let him, like the dandy at dinner, be "easily satisfied with the best of everything." Let his buildings be of the best construction, and placed in the best position for work; let the extent of his holding be large enough to exercise his best energies; and let his capital be amply sufficient to back his intentions; let us just take for granted these few matter-of-course items, and then every man will have his fixed engine.

It is curious, and it may be instructive to remark on the manner in which the meeting divided on the systems before them. Mr. Cuthbert Johnson was decidedly for the fixed engine, more especially from its superiority for the purposes of irrigation—an advantage, by the way, which, as far as concerns convenience and general applicability, we should

be very much inclined to question. Mr. Bradshaw, but an amateur, we believe, as yet in practical agriculture, was also for the fixed power, both from what he had been told and what he had been shown in the north. Mr. Nesbit also followed on this side, grounding his verdict on the liability of the moveable engine to accident, as well as from the other "drawing a greater amount of heat from coal." We have heard rather that the portable engine, where used *on farms*, consumes far less fuel in proportion to the extent of power used than the fixed one? Mr. Oakly, again, if he had the opportunity of erecting his own buildings, would have them with the fixed engine. And lastly, Mr. Thomas, of Lidlington, one of the Duke of Bedford's chief tenants, is all for the fixed power; simply because he has "the best of everything." We are told his homestead, as lately completed for him by the Duke, is one of the best in England; but then it is one in ten thousand.

Mr. Baker, on the other side, taking, as he always does, common cause with the practical working tenant-farmer, and arguing on his position from what it really is, inclined to the portable machine.

"Where one individual could not expend £300 in the purchage of an ingine to thrash his corn, thirty individuals, by subscribing £10 each, accomplished the same object conjointly. That remark applied to the locomotive engine; and he thought that in the present state of things that form of engine was likely to be employed more extensively than the fixed engine. Where the occupation was large, and the means ample, a fixed engine would perhaps be found most advantageous; but under ordinary circumstances the locomotive appeared to have the preponderance of advantages."

Mr. Wood, too, came as much to the point:—

"Of course, in dealing with a question of that nature, they must take into consideration the various positions of farmers, the differences between their respective farms and their powers of employing one kind of engine or the other. With regard to fixed engines, he believed that at present the steadings, except in cases in which the buildings had been erected recently, and upon modern plans, would seldom be found convenient for their employment. Wherever the homestead was conveniently situated and arranged, fixed engines, he thought, would be found most desirable; but where the case was otherwise, he believed locomotives would prove preferable. In his own district the farms generally were of small dimensions; and, of course, in such cases the purchase even of a locomotive, much more of a fixed engine, was out of the question. He had himself a locomotive engine, which, not having full employment for, he had let out among his neighbours, and perhaps by this means he would get enough to pay for it within a few years."

While Mr. Payne found himself on his legs rather unexpectedly on being gravely assured by Mr. Nesbit that, if the buildings did happen to be separated, it would be far better to have three or four fixed engines than one portable. He appears to have felt this bit of advice far more keenly than the gentleman who proffered it:—

"His farm was so arranged that there were four or five homesteads, and, speaking for himself, he should say that a portable engine was decidedly the best for him, under those circumstances. He could have on the farm all the other requisites; he could attach to the portable engine his chaff-cutter, and other machines. What they had to consider was not only which form of engine was the best constructed, but which was the most convenient for general use among farmers; and he was convinced, from his own experience, that there was no comparison between the two. Mr. Thomas had made some remarks with regard to danger from weather, loss sustained in moving about, and so on; but he (Mr. Payne) did not see much force in that objection, as a portable engine was, of course, kept to a great extent under cover. It was absurd to suppose that a farmer, however opulent he might be, would not take a pounds-shillings-and-pence view of the matter, and that if his means were adequate he would have a fixed engine on every part of his farm."

It will be seen that this division has rather a tendency to class the practical man against the one not so directly engaged in the pursuits of agriculture. We ourselves believe that it must be long before the fixed engine can come into general use; never, in fact, until some great changes are accomplished. At the same time we are quite willing to admit its value under a different state of circumstances; although we object altogether to the implied disparagement of one while recommending the other. In Scotland it appears the fixed engine is preferred; in the best cultivated districts of England the portable. In Lincolnshire, for instance, nine-tenths, at the very least, of those now in work, are of the latter description. The wear and tear, with the liability to accident incidental on the use of these locomotives, strikes us, too, as rather overstated. If you can only ensure one perfect in its action at starting—and they are coming day by day more and more so—it will, with common care, require but very occasional repair, and last quite long enough to be amply remunerative. The first introduced into the county we have referred to (Lincoln), after ten years' very heavy work as an engine let out to hire, was sold at two-thirds of its original cost.

For present use—and what we would wish to see, is the steam-engine in general employment—we believe the portable is that more especially adapted to the times. We are never advocates for asking too much of either landlord or tenant, and we should so advise them, if they cannot give or get "the best of everything," to make the best of that they have. In doing so—in calling their best consideration to the merits of a machine that *is* within their reach, we shall conclude our summing-up with another extract—taken this time not from the Farmers' Club, but of the Royal Agricultural Society of England. In Mr. Pusey's report to his Royal Highness Prince Albert, as President, on the

agricultural implements sent to the Great Exhibition of 1851, we read that—

"These *moveable* steam-engines have been called forth by the Royal Agricultural Society within the last ten years, and appear preferable in general to the fixed engines for the following reasons:—

"If a farm be a large one, and especially if, as is often the case, it be of an irregular shape, there is a great waste of labour for horses and men in bringing home all the corn in the straw to one point, and in again carrying out the dung to a distance of perhaps two or three miles. It is therefore common, and should be general, to have a second outlying yard. This accommodation cannot be reconciled with a fixed engine.

"If the farm be of a moderate size, it will hardly—and if small will certainly not—bear the expense of a fixed engine: there would be waste of capital in multiplying fixed engines to be worked but a few days in a year. It is now common, therefore, in some counties, for a man to invest a small capital in a moveable engine, and earn his livelihood by letting it out to the farmer.

"But there is a further advantage in these moveable engines, little, I believe, if at all known. Hitherto corn has been threshed under cover in barns; but with these engines and the improved threshing machines we can thresh the rick in the open air at once as it stands. It will be said, How can you thresh out of doors on a wet day? The answer is simple. Neither can you move your rick into your barn on a wet day; and so rapid is the work of the new threshing machines, that it takes no more time to thresh the corn than to move it Open-air threshing is also far pleasanter and healthier for the labourers, their lungs not being choked with dust, as under cover they are; and there is, of course, a saving of labour to the tenant not inconsiderable; but when these moveable steam-engines have spread generally, there will arise an equally important saving to the landlord in buildings. Instead of three or more barns clustering round the homestead, one or other in constant want of repair, a single building will suffice for dressing corn and for chaff-cutting. The very barn-floors saved will be no insignificant item. Now that buildings are required for new purposes, we must, if we can, retrench those buildings whose objects are obsolete. Open-air threshing may appear visionary, but it is quite common with the new machinery; nor would any one perform the tedious manœuvre of setting horses and men to pull down a rick, place it on carts, and build it up again in the barn, who had once tried the simple plan of pitching the sheaves at once into the threshing-machine. These moveable steam-engines have been gradually improved by the yearly trials of the Agricultural Society."

It is remarkable how strongly Mr. Pusey's opinions corroborate those held by the more practical authorities of the Farmers' Club.

ON THE CULTIVATION OF MANGEL WURTZEL.

BY MR. ROBERT BAKER, OF WRITTLE.

Of root crops, the first and most important is mangold wurzel, of which we may still say it is the "root of scarcity," and with the exception of the turnip perhaps there is no other description of root so serviceable, in combination with which it fills a place that root failed alone to supply. The Swede turnip is especially adapted for early feeding, but deteriorates as spring advances. The mangel wurtzel, on the contrary, is adapted for late feeding, and, almost useless at first, as the winter advances becomes more and more useful, until in the months of March, April, and May it becomes the main dependence of the farmer for feeding almost every description of stock. From the circumstance of its being grown upon soils with great advantage, upon which turnips do not well succeed, it is rendered doubly valuable, extending an advantage to the heavy land cultivator that no other vegetable production has been found to afford. The further advantage derived by root cultivation from the application of guano, superphosphate of lime, and various ammoniacal manures, applies equally to the production of mangel wurtzel, and thus gives an advantage to the cultivators of strong clay lands unknown at any former period, and scarcely to be estimated in this. This root, however, is generally grown upon tender loamy soils, for which it is peculiarly adapted; for although it may be grown successfully upon strong tenacious clays, the difficulty that exists of carting off the roots in November renders it a hazardous process, especially in such a season as that of 1852, when the continual wet weather rendered it impossible.

The system of cultivation, as carried out by the best cultivators, is to plough the land immediately after the previous wheat or barley crop has been removed, the land selected being that upon which clover has preceded wheat. The land should be well scarified and again deeply ploughed, and in October be formed into ridges two feet nine inches in width; if sufficiently dry these should be subsoiled between to the depth of four inches or more in each furrow, and if the weather during the winter permits, the ridges should be again ploughed, and the furrows subsoiled as before; but if the land should not be sufficiently dry, it should be deferred until the spring, and if the furrows in which the heaps of dung are deposited be subsoiled previous to the manure being spread, but little injury will be sustained from the pressure of the wheels. But in that case the operation of subsoiling and manuring should be carried on together; the subsoiling may be well effected with one of Bentall's broadshares, using the centre portion only.

Messrs. Gray, of Glasgow, have also invented a subsoil implement, which, by being used in each furrow alternately with the plough, will pulverize the subsoil to the further depth of five or six inches, and is far more effectual in the production of root crops than by ploughing the land very deep in the first instance. There is also a small implement invented by Mr. Bentall, of Heybridge, upon the principle of his broadshare, which is admirably adapted in the same way for producing a deep tillage for root crops.

The quantity of manure requisite is twenty full cart-

loads, each of thirty-six bushels, per acre; the manure should be partly decomposed, but it is thought better to apply ten loads only, and to add two cwt. of guano, mixed with the same quantity of salt, per acre. This may be sown broadcast before ploughing the last time, and will turn in readily with the plough. The land should be immediately rolled down, and provided it is sufficiently dry a two-horse roller is preferred.

The seed must then be drilled or dibbled, at the rate of 3lbs. or 4lbs. per acre, but in either case it ought not to be deposited beyond *one inch* in depth, and if previously steeped forty-eight hours in water, will, if there is a tolerable degree of moisture in the land, succeed better than if sown in a dry state. Whenever it is dibbled, the holes ought to be from twelve to fourteen inches apart, with from three to four seeds deposited in each hole, and the soil replaced over them and again rolled; the success mainly depends upon having the soil finely pulverized, so as to close readily upon the seed. And to effect this, all land of the strong clay description is best manured previously to the winter, being ploughed upon stetches six feet wide, and, after the surface has been exposed to the effect of frost the whole winter, it is then scarified, and three rows only are drilled upon each stetch; or the seeds may be deposited with the fingers in the drills exactly one foot apart, putting two or three seeds at each space.

Four cwt. of Peruvian guano, or six cwt. of superphosphate of lime, is about equal in effect to twenty cart-loads of good farm-yard manure per acre; and if three cwt. of fishery or common salt in each case be added, it will materially increase the produce, and amply repay the application. As this root extracts largely from the soil (but not so greatly upon strong loams and clays as the Swede turnip), it is advisable to substitute artificial manure, wholly or in part, for its production, and to reserve the application of the ordinary manure until the crop is removed; this reduces the cost of its production as a fallow crop to about three pounds per acre for the manure and cultivation over and above the cost of the tillage ordinarily given; and when from twenty-five to thirty tons of valuable cattle food can be obtained at such a cost, it must be evident that the cultivator will be fully repaid its production.

As soon as the plants have arrived to about three inches in height they must be singled out, and, if drilled, set out at proper distances by hand; this should be carefully performed, the best plants being singled from the rest, and the weaker ones removed. The land will sometimes require hoeing before the singling of the plants takes place, as myriads of small seed weeds generally spring up with the plants; and if once suffered to choke them, no after management will remedy the neglect. After the plants are singled, and the tops of the ridges carefully hoed, a horse-hoeing will become necessary, and which the previous subsoiling will allow to be executed properly; but if the land has become consolidated in the furrows, it will be better to subsoil again immediately after sowing, as it will enable the horse-hoe to enter readily afterwards, and give an excellent tilth to the land.

Subsequent hand and horse hoeing will, from time to time, be necessary; the hand hoeing should be performed by drawing the soil from the plants, so that at the expiration of the year the land will be nearly level; and great care should be taken to let each plant stand singly, and perfectly clear of weeds.

The roots will be fit for storing during the month of October, and it will be better that this should be effected early, rather than late. As soon as the lower leaves begin to turn yellow, the roots may be pulled; the leaves should be wrung off, but no portion of the fibres should be cut. The best mode of storing them is in long heaps or clamps; the bottom being about eight feet in width, and the roots packed, with the tops outward, to the height of six or seven feet, so that when finished it should resemble the roof of a thatched building. A covering of straw, a few inches thick, should then be placed as thatch, and a covering of earth, sufficient to exclude frost, be placed externally, leaving the upper portion uncovered until winter has commenced. In case of severe frost, a slight covering of mulch or wetted straw must be added, the roots, like those of the potato, being entirely destroyed by its action; but in any convenient building, having walls sufficiently thick to resist frost, it may be kept equally well.

It is not usual to use the roots for feeding until February; but if they are plucked or sliced, and combined with dry food, as cut chaff, &c., and meal, they may be used immediately; there is still, however, much difference of opinion upon their feeding qualifications as compared with Swede turnips; but they have this advantage over that root, that about as fast as it depreciates by keeping, the mangel wurtzel *improves* and therefore it becomes invaluable in March, April, and May; and by slicing it and mixing it with Swede turnips at first, it may be used with more advantage than by even feeding upon it alone. For milch cows it is excellent when combined with other food, as it does not impart any bad flavour to the milk or butter; for young neat stock, especially weaned calves of two months old, in equal portions with Swede turnips, it is equally good; but for sheep before lambing it is not adapted; but afterwards, if combined with cabbage or other green food, as rye or rye-grass, it is excellent. Sows whilst breeding are particularly affected by it, and if allowed to eat plentifully of it, the pigs will die or become so much stinted as to be almost worthless; the same effect follows with small pigs, but larger ones thrive well upon it; and horses also may, if thought desirable, be fed upon it with advantage; poultry also, especially geese and turkeys, eat it with avidity.

If oxen or neat cattle are suddenly fed upon it entirely it sometimes produces a species of paralysis, from which they but slowly recover, and therefore whenever feeding upon it is commenced, the quantity should be gradually increased to one cwt. per diem, but one-and-a-half cwt. appears to be the extreme quantity that can be judiciously applied.

The varieties usually cultivated are the long red, and globe red, and the long yellow, and globe yellow; but whenever experiments are made, care should be taken to

obtain a good stock of each variety. It will then be found generally that the red varieties produce greater weight than the orange. The latter is, however, decidedly the best adapted for light descriptions of soils, and the former for heavy soils; the difference in quality remaining still in uncertainty, some affirming one variety as best and some the other, but the predilection is in favour of the orange variety, notwithstanding which hares and rabbits select the long red whilst growing, and it is also said that cattle and swine will do the same.

The usual time of sowing is from the middle to the end of April, but it will succeed a fortnight earlier or later, and has produced good crops when sown as late as midsummer. Horses, cattle, sheep, swine, and poultry, especially turkeys, feed readily upon it. If well stored, it will furnish a supply for nine months of the year, and by using it in its young state combined with the leaves, may even be used for the other three months. The amount of food produced per acre is greater than that from other descriptions of roots, and it succeeds upon almost every description of soil, and resists drought better than any other vegetable.

There are many varieties cultivated: these depend mainly upon the taste of the cultivator; but a well-selected stock can only be produced by selecting the finest and clearest roots, which should be planted in March, and covered over with mould to protect them from late frosts; and whatever sort is cultivated, the roots should be selected similar in character and form to each other, and alike in colour; above all, a fine taper bulb with a well-formed top or crown, and not having any straggling or fibrous roots or coarsely formed leaves, should be selected. The red varieties should have dark-green leaves, with pale red footstalks; and the orange variety should be of lighter green, and paler-coloured footstalks: the bulbs of the former should, when cut, be beautifully variegated light red, and the latter pale orange. And as the value of the produce depends entirely upon the stock, seed never should be purchased of persons who cannot be well depended upon; at most three or four shillings will produce the requisite quantity of seed for one acre of land, whereas the value of the crop may frequently vary from five to six pounds per acre, entirely from not having paid due attention to that circumstance; as seed can be grown from small plants obtained from seed sown in July and merely dibbled out, without any selection whatever, and as this process produces the largest quantity of seed, a sufficient inducement offers to seedsmen to effect its growth by that process.

The mode of feeding with this root should be adopted cautiously, as it is apt to affect young animals when not previously accustomed to it, especially if suddenly allowed to eat their fill; to effect this properly it should be given in admixture with turnips for some time, increasing the quantity gradually, and if combined with cut chaff, being first bruised or plucked into small pieces, it answers still better; to which may be added from one to one-and-a-half pounds of bruised linseed, previously steeped in cold water for forty-eight hours; the chaff should be moistened with this overnight, and mixed with the roots, and from four to five pounds of barley or bean meal added; this admixture costs about the same per pound as oilcake, but will be found vastly more efficacious. From one to two cwt. of roots is a full allowance per diem to an ox, but one-and-a-half cwt. will in most cases be found sufficient.

It must be remembered that very young cattle are seldom affected by it; and although, as before stated, cattle, if put suddenly to feed upon it, sometimes are so affected, still this never happens except to a limited number, ten per cent. being a large average, rarely affecting them more than once, and that for only a few days, and which, as before stated, may by judicious management be entirely obviated.

With those persons who have not adopted its growth some prejudices must be expected; for all purposes Swede turnips are better than mangold-wurzel, but for spring use the latter is far superior to Swede turnips, whilst the quantity of food per acre is increased, and if well stored becomes available during severe frosts. The crop is also subject to less hazard than turnips, being rarely subject to blight or mildew, and resisting severe drought. And as its German name—"mangold-wurzel, or the root of scarcity"—defines its properties, that is, after all, the best spelling to adopt; but perhaps "beet" is a word more easily and more generally applicable.

The produce on land properly cultivated will average from twenty to forty tons per acre, but twenty-five to thirty tons is the usual quantity grown in the eastern counties, which, from having a drier atmosphere than the western or northern counties, are especially adapted to its production.

A new variety, called "Silesian Beet" has been recently introduced for the manufacture of sugar; and as it contains a larger proportion of saccharine than the common varieties, it may probably hereafter form a valuable addition to our cultivated field roots. From experiments made by myself, I am confident that its fattening properties are much greater than those of mangel wurzel; but, at the same time, its produce is much less. By leaving the plants closer in the row, I am enabled to obtain about two-thirds of the quantity per acre; and as I consider two cwt. of it is equivalent in feeding value to three of mangel wurzel, I am disposed to pursue the cultivation, especially as I find it far better adapted for early feeding than the mangel wurzel. And I frequently commence using it by the middle of August, by chopping the roots and leaves (which are very tender) together for milch cows; and by mixing them with cut chaff, I find an excellent substitute for grass in seasons of drought. I have also used it when sliced and dried on a kiln, for making beer, which keeps well, and is made at a cost not exceeding ten shillings per hogshead; and I have no hesitation in stating that it is equally wholesome as beer brewed from barley-malt—upwards of thirty persons having drunk it daily for the last eighteen months. I have it now in all stages—some brewed in October, 1851, without the least acidity, and excellent in flavour and quality. The prejudice, however, is always so great against anything new, that I have ceased to recommend its adoption by others.

ON THE IMPROVEMENT OF OUR DOMESTICATED BREEDS OF ANIMALS.

"The first quarrel on earth took place between a farmer and a grazier." So commenced a sermon by a living divine, in a large manufacturing town; and well it might, when there were no men but farmers and graziers to quarrel. But the controversy between the two, and between each other, has not yet been settled. One class of opinions prevails in one district, and another in another; some preferring Southdown, others Leicester, and some Cotswold sheep; some praising Shorthorn cattle exclusively, others Hereford, and others Devons; some again insisting on large, others on small animals, being the best and most profitable.

There are points where controversies begin to converge; and there are others where they diverge almost with the same rapidity. For instance, all can agree that the power which a breeder possesses over plastic nature is perfectly wonderful. There is not a breed, how far soever it may be from beauty or excellence, which may not be vastly improved in itself. The Hereford cow is quite another animal from what she was twenty years ago; more symmetry, earlier maturity, and a more kindly grazer. The Highland sheep has perhaps undergone more real improvement, than any other kind of animal. Take the ordinary run, say twenty years ago, and compare it with those often shown at the Highland Society's Shows, and while you have every absolute characteristic of the breed, you have animals as far superior as if the species had no alliance whatever.

Now had all these varieties one common origin? Were they varieties improved or changed by circumstances from one common stock, of which we have not any types? or were they all the followers of one common ancestor, now defunct?

That the first is a much more reasonable supposition appears evident from the fact that although changes will pass over domesticated breeds of animals, it is not only easy to change for better or for worse by proper or judicious attention on the part of the grazier, but it is equally difficult, without the same care being exercised, to keep a breed in its state of purity and caste; yet in wild animals no change whatever seems to take place. The wild cattle at Chillingham, for instance, are the same as they were centuries ago; nor can we see any changes pass over wild animals of any description. It is artificial domestication which produces all these changes in the characteristics of a race.

It now seems to be generally admitted that at least all kinds of sheep had one common origin; here the controversy between the farmer and the grazier converges into unanimity; but when the identical original animal is to be pointed out, the divergence is as wide as possible. The treatise by Milburn on the sheep and shepherding, published by Orr, contains a discussion of the question at some length, and inclines, for reasons there given, to the *Argali* as the original of the sheep. Quoting first the opinions of the best and most observant zoologists as to the natural history of that animal, its facility of domestication, its tendency to lay on fat, the shape of its horns, &c., he traces the earliest indications of history, and applies these incidental allusions to the animal to the habits which Cuvier and other naturalists prove possessed by the *Argali*, and then appealing to the drawings discovered by Belzoni in Egypt and Layard at Nineveh, shows the Egyptian and Assyrian sheep of these early ages to be an *Argali* in its transition state.

He says "Applying our knowledge as obtained inferentially from the most ancient of records, we find incidental notices leading to fix the character of the earliest sheep of which history informs us, with one or other of the class of animals alone referred to, but especially the latter (*the argali*). Abel had firstlings of his flock, hence he possessed domesticated animals. The lambs of the *Argali* would be a ready means of procreating a flock, as they are even now easily domesticated, and which would hardly be the case with the untameable *Musmon*. Abel also offered fat, which is a secretion common to the *Argali*, but of which the *Musmon* is said to be destitute. The sheep of the patriarchs too had horns; at any rate the rams had that distinction. Nor could they be simply upright; as a ram, it will be remembered, was caught in a thicket by his horns, when the staying angel arrested the hand of Abraham. The curvature of the horns being much more nearly complete in the *Argali* than the *Musmin*, which are nearly bent backwards, renders it most likely of the two to be entangled in a thicket. That the sheep were some of them brown in Jacob's day, is quite certain, from their being set apart for his wages, and this again agrees with the colour of the *Argali*."

Carrying the proofs onward beyond the written and to the pictorial, he speaks of the Nimroud sketches as "giving a very accurate idea of the progress the *Argali* had made in supplying the wants of man at this early period. The tail had lengthened and thickened, the fat had begun to accumulate, and the hair had become woolly; the horn, which

was still nearly circular, had become smaller, and the legs and head thicker." In reference to the Belzoni sketches, he says, among other marks of progress, "there is a long thick tail exhibiting either fat or wool, either of which would be an approach towards some of our modern breeds. The legs and feet are clearly those of a sheep, but the body is deer-like and very much resembling the *Argali*." He goes on in a subsequent part of the work to give a list of sheep now existing, showing types of what he conceives to be every step between the *Argali* and the Leicester, tracing the changes one by one from the Barbary and Cape sheep down to the Welsh, Shetland, Dorset, Cotswold, and ends with the Leicester.

Through these we shall not now go; but the practical bearing of the question is one highly interesting to the farmer. Cannot a Dorset sheep, for instance, be vastly improved? If the remarkable tendencies of that animal to breed all the year round, and twice a-year, could be combined with a little improvement of fleece and carcase, would it not amply repay the breeder?

The same writer gives some hints on improving a flock, which, as it applies to all kinds of animals, is worth quoting: "Uniformity," he says, "is best attained by drafting off regularly the failing ewes, and breeding from one common sire, which appears to have a peculiarly favourable influence in the breed, greater even than the mother appears to exercise in the flock: for while a mother can only influence two animals, the ram will influence the whole of the produce in a greater or less degree." The mode of going about this, he thus lays down: Speaking of improving and giving uniformity to a flock, he says, "The breeder does not select at first that which has the most of these qualifications, but which is perhaps the widest from and most unlike his own flock; but he takes those which show a tendency to pervade in one uniform direction—not an individual, but the whole of his flock; and this he takes to mend his own. By this means all are a little improved in the direction he requires, and all keeping *alike* in their general contour, there is a kind of permanency and uniformity in the main features of the improvement." We consider it no bad sign for a breeder to have his flock as near alike as possible. Many men may have accidental animals, of remarkably good qualities; but when all are alike it looks like skill. Milburn says, "No unskilful man ever long kept a flock in a state of anything like similarity to each other. Uniformity is as important to the jobber and the butcher as it is to the grazier. The merit of being 'even' is always appreciated in a market, because they ever suit the same class of customers."

The breeder must try higher and higher: he must aim at cultivating a combination of more wool. This has been somewhat neglected. Now that it pays even better than mutton itself, it is deserving of the greatest attention. It is possible to carry more wool and still secure as much fat and yield as much mutton. The *tendency in the animal* and plenty of food will do it; and the effort of the breeder is simply to consider the sheep as a vitalized machine for converting food into money; and he will find no animal which, in the run of years, will pay better for attention than the sheep.

OIL FROM TOBACCO SEED.

A discovery which may prove of some commercial importance appears to have been made by a British resident in Russia—namely, that the seed of the tobacco-plant contains about 15 per cent. of oil, possessing peculiar drying properties, calculated to render it a superior medium, especially for paints and varnishes. The mode of its extraction is described in the following communication:—

"Sir,—Having been fortunate enough to discover that the seed of tobacco contains above 15 per cent. of its weight of drying oil, of superior quality and of easy extraction, I take the liberty of communicating this discovery to you, as one which, if published in England, may be of great advantage to those of the British colonies where that plant is cultivated.

"The process employed by me for the extraction of the oil is to reduce the seed to powder, and knead it into a stiff paste with *quantum sufficit* of hot water, and then submit it to the action of a strong press. I then expose the oil thus obtained to a moderate heat, which, by coagulating the vegetable albumen of the seed, causes all impurities contained in the oil to form a cake at the bottom of the vessel employed, leaving the oil perfectly limpid and clear.

"The oil from tobacco-seed, though extremely limpid, possesses the drying quality to a much higher degree than any other oil known to me—a circumstance which will render it of great value to painters and varnish-makers.

"The only object I have in making this discovery known to you is my desire to be of service to my country and fellow-subjects, and my not having the means of publishing it myself in England.

"Hoping you will kindly condescend to pardon the liberty I have taken, I have the honour to be, Sir,

"Your humble servant,

"ALFRED HALL-TREDINNICK,

"Member of the Imperial Russian Geographical Society, and Gardener to his Excellency General Alexander Vsevolodjsky, at Tchernoy Rinoke, near Kisliar.

"*Tchernoy Rinoke, near Kisliar, April* 1."

THE AGRICULTURAL GEOLOGY OF ENGLAND AND WALES.

BY JOHN DONALDSON.

Geology examines and illustrates the structure, investigates and settles the order and relative position, and ascertains the natural and contingent qualities of the various substances that compose the crust of the terraqueous globe, of which parts alone any knowledge can be obtained by specific observation. In the sense in which the word is taken by Werner, geology aspires to the higher merit of recording the events of periods when the planetary system, of which the earth forms a part, was yet uncreated, and of assigning causes to effects, and explaining phenomena before it is ascertained whether they really have existence, or are merely the offspring of fancy and ignorance. The science may be divided into descriptive and speculative—the former giving a general account of the materials of which the globe is composed, and of their arrangement; while the latter is confined to theories of the earth, or the manner of structure and the changes of disposition. The former must necessarily engage the chief attention; while the latter requires a transient notice, as it is the introduction to the preceding department of enquiry.

In most of the theories that have been put forth by our earth-making writers, it has been assumed as a principle that the agglutinated and hardened mineral masses, which we see forming mountains, and to which we have given the name of rocks, originally formed the crust of the earth, whether they have been produced by igneous or aqueous agency, or whether they have proceeded from a state of solution or of fusion; and that all the other bodies and formations, massive, detached, or reduced in form and substance, have appeared at subsequent periods, from the decomposition of the original formations, by the effect of convulsions, disruptions, and of the general deluge; to all which phenomena, by the almost universal consent of opinion, the globe has been subjected.

Geologists reckon five formations:—1. Primitive rocks. 2. Transition. 3. Secondary or fletz. 4. Alluvial. 5. Volcanic. The first is thought to be the oldest, as they contain no organic remains, as in the other formations; and they support, but never rest upon, any other strata; and they contain, either occasionally or exclusively, almost every metal yet discovered. The second class indicates a transition or passage between the perpendicular primitive, and the secondary or horizontal strata, and between organic and inorganic evidence, and from one state of existence to another. In these rocks, organic remains are not wholly wanting, but are not always found; and hence the distinction is not very clearly marked, in many cases, whether they belong to the first or to the secondary formation. In the fletz formation, the rocks lie horizontally, or in regular strata, and are particularly distinguished by the number, variety, and abundance of fossil organic species of animal and vegetable exuviæ, which they contain imbedded in their substance. The structure is much less crystalline than the two first divisions, being softer, and easier decomposed. The distinction that has been drawn between these formations as to priority of existence is now gradually giving way to the opinion that the difference in the composition as to hardness and the want of exuviæ, may be owing to the agency of some superior force that has overruled the formation and not to any remote epoch of time. The rational difference between the theories is not great, as it leaves to be found the force or agency which has caused the visible and striking differences, both in the appearance and composition.

The chalk formation is the uppermost stratified rock; and above it are placed the tertiaries, or the alluvial and diluvial formations. These names are indefinitely applied to the vast assemblage of loose materials, evidently collected in a tumultuous manner, showing a large variety of heterogeneous substances, deposited without order, and never covered with any rocks or solid strata. It is a simple arrangement to consider all the formations to be alluvial that lie above the chalk, and to differ only in the time and mode of location.

The uppermost alluvial deposit forms the cultivable stratum, and is known by the name of "soil." It is mostly composed of clay, sand, and gravel, which in a great variety of combinations and modifications constitute the land of agricultural language. The formation is supposed to have proceeded from previously existing rocks, and by the detrition of other formations, broken down by the gradual action of air and water. The formation is still going on; and the evenness of the deposition shows a much more quiescent state of the globe than at former periods. But the decay of rocks must be very gradual; for in dry countries, inscriptions are perfect, and the angular edges and shapes are little blunted or altered after the lapse of twenty centuries. Depositions go on in many places very slowly, and are

made by the sea, fresh-water rivers, and by lacustrine sediments from substances collected and rolled along by the course of the waters over the earth. But the time required is beyond all reasonable admission, in order to form the immense deposits of various depths that are seen on the face of the globe; and we are driven to the not very unfeasible supposition, that some convulsions of a nature more moderate than the diluvial deposition has been at work in producing and locating the alluvial stratum. It is evident that water has been a very extensive agent, at least in the later revolutions and changes on the earth; the flatness of the secondary rocks, the tumultuous and discordant position of the diluvial substances, and the even surface of the alluvial stratum, all demonstrate the agency of a fluid body in different states of action. The recess of the waters is not very darkly indicated by the deposited alluvium being deepest in the valleys, where the fluid had assembled in the largest quantity, and had remained for the longest time. Soils are often found in an unaltered state resting on the rocks from which they have been produced by detrition, and are composed of similar substances in the basic elements. This property is found in much diversity and in many modifications, and the alliances of the soil and the subjacent formation are often seen to be very distant and remote. Admitting the very probable agency of water, in effecting the detrition of rocks, and in locating the decomposed materials, the conclusion may be assumed, that the soils which resemble the subjacent rocks have been deposited on the spot where formed, by an undisturbed state of the acting fluid, and that where different natures exist of the land and the underlying formation, the sundered and divided materials have been carried about and deposited at random by the agitation and careering of the waters. The greater part of soils seems to rest on this assumed formation; for lands often contain substances that do not exist in the rocks on which they rest, and rocks frequently possess materials of which no vestige can be detected in the upper soil, and which being destructible, would be found in some degree or quantity, if soils were wholly derived from the subjacent formations. These circumstances would appear to indicate that other agents than detrition have been at work in the production and location of soils.

Soils are chiefly composed of alumina, silica, lime, magnesia, potash, and oxide of iron; some salts are also found, and other ingredients in some small proportions. The earthy base may have been derived from the detrition of rocks, and other substances acquired from the water, and deposited with the sediment in solution. The chief article in the fertility of soils is the quantity and quality of the animal and vegetable remains, which have proceeded from the decay of the organised bodies which have lived and died upon the surface. And very much depends on the mode and manner in which the different substances are mixed together, both in their own connection, and relatively to other bodies. The quantity of the exuvial matters will be owing to the favourableness to animal and vegetable life of the earthy stratum, after it was located by the water; to the number of organized bodies it was able to attract and maintain till they died and decomposed upon it, and to the peculiar manner in which it has become intermixed with the earths of the underlying detritus. To these may be added, the influences of climate, which may be greater in many cases than the nature of the soil itself.

In the following essay, it is assumed that soils have been produced in the first place from the detrition of rocks, and subsequently mixed with other substances by the agency of water and air, the reciprocal action of the primary elements, and the remains of organized life. The sea and fresh-water rivers have acted as secondary causes, and have helped the formations in the number and variety. Adopting the forementioned theory of the original formations, and adhering to the received notions of the subsequent detritions and locations, it is most natural and convenient to begin with the primitive formation, consider the effects of its decomposition, and describe results, as the soil is seen to be formed from them. The regular ascending order of the series will lead to the last formation, or the cultivable stratum, which forms the land or soil, or the sub-aërial deposit of the more refined nomenclature.

Primitive rocks rise to the surface in Cornwall, being the only appearance of the kind in England and Wales, where there are seen granite, serpentine, hornblende, and transition grauwacke, or rather clay-slate of that formation. The relations between the soil and the subjacent rocks are nowhere made with greater facility than in the west of England, and particularly in Cornwall. Granite is the constituent rock in the mountain range; grauwacke is found on each side of it, both sides having nearly the same inclination. From these two formations the soils of Cornwall are chiefly formed, and are the lowest in the arrangement of the strata of our island, being primitive and transition. The last is the clay-slate, not the rock of grauwacke.

Granite forms the mass of Dartmoor, in Devonshire, and is capped by the green sand; a remarkable instance of the approximation of the primitive rocks with the later formations. There are no soils in Devonshire immediately from the granite, the extent of the rock being small and placed above the range

of cultivation. A small patch of granite is seen in the Isle of Anglesey, but too inconsiderable for notice.

Granite, or the "moorstone" of Cornwall, and the whinstone of Scotland, is an aggregate of quartz, mica, and felspar; and many varieties are there found, both in the size and colour of the component parts. The best, for the formation of soil, is the red and flesh-coloured species, which contains the greatest quantity of felspar, often 70 to 80 per cent. of the whole rock. Granite is very prone to desquamation, and granitic chains are topped with rounded masses, which are formed from that property of the rock. Quartz is a very hard body, infusible before the blowpipe, and contains 99⅞ of silica, with a trace of ferruginous alumina. When the pieces are sundered by the decomposition of the granite, the soil is seen to be thin and herbless, and formed by the unconnected quartzose gravel, as the rains wash away any earthy sediment, and leave the pebbly stratum. Mica melts before the blowpipe, and contains about 10 per cent. of alumina, and 10 of potash. It is an essential constituent part of granite, and tends to facilitate the decomposition of the mixed rock. Felspar melts without addition before the blowpipe—contains 20 per cent. of alumina, and 15 of potash, with a trace of oxide of iron, and a portion of lime. The alumina and potash give way to the action of moisture, and of carbonic acid in the air, the rock of granite is decomposed, and soils are formed; the best in the low grounds, and the inferior nearest to the parent rock, according as the rains leave or carry away the harder or softer materials. The felspar of Cornwall granite is the earthy sort.

The general distinctive characters of the extremely various vegetable soils, may be arranged under the heads "black growan" or gritty, and the "shelfy or slaty" soil. The former abounds in the Highlands, the upper stratum of it chiefly consisting of a light black earth intermixed with small gravel, which is the detritus of the granite, or "growan," and hence the soil receives the said appellation. This stratum on the tops and sides of mountains is very shallow, and not of considerable depth, even on the more level and extensive wastes; its natural produce is a thin short heath, and dwarf or Cornsih furze. The very rare and handsome plant "Erica vagans" is found on these wastes, being the most beautiful of the English heaths.

The clay-slate follows the granite, and occupies a large extent in Cornwall. The variety gets the name of "killas," the slate being smooth to the touch, but not unctuous: the colour varying from dark grey to white, the lustre silvery, and the structure schistose; it is very rich in ores. Greywacke is a transition rock, composed of angular or other portions of quartz, felspar, Lydian slate, and clay slate, connected together by means of a basis or ground of the nature of clay-slate, often impregnated with silica, and thereby deriving a considerable degree of hardness. The imbedded portions vary in size, but seldom exceed a few inches in breadth and thickness. When the imbedded portions become very small, the rock assumes a slaty structure, and forms the greywacke slate of geognosts. When the grains almost entirely disappear, and the rock is principally composed of clay-slate, it is termed "transition clay-slate." This slate has often a very earthy aspect, and another has been found in a conglomerate state, and called "pudding stone." Common greywacke does not occur so frequently as greywacke slate, and transition clay-slate.

Grauwacke is a more compound rock than granite, and consequently more liable to decomposition, and the elevation and position are more favourable to vegetation. The soil on the clay-slate is a light loam mixed with slaty matter, and is the most prevalent on the gentle declivities and lower grounds. The schistose or slaty matter distinguishes it from the particles of granite, and the pure loams are void of either distinction, being formed of the best materials carried by the rains from the higher grounds to the lower positions.

Serpentine occurs in Cornwall as a primitive rock, and is attended with the usual barrenness of the crystalline structure of that formation. It is lodged in the low levels of Alpine districts, and the magnesian quality is inimical to vegetation. Hornblende runs through the formation, and the detritus is used as marl. The best soils occur where the plutonic rocks are erupted in the regular formation of the slate, and a volcanic ash is seen at these junctions. The mines are mostly found where the grauwacke meets the granite rock. Free stones, steatites or soap stones, and China stones, are of frequent occurrence; but being only veins, or subordinate, they do not exercise any influence on the formation of the soil.

The soils derived from granite and grauwacke, are loose and incoherent, owing to the pebbly particles of the ingredients in quartz and mica, and the felspar being rather an earth than clay, and wanting in the viscous binding quality of that body. They are most peculiarly favourable to the action of bone manure, agreeing very minutely in one essential requisite for the power of that fertilizer, in the fineness of the composition of the soil. And though the other requisite is wanting in the warmness of the land, yet the pre-eminence of the fineness of composition completely dispenses with the quality, and shows that a superabundance of one element in that case is able to supply the

place of another. The granite particles and the schistose fragments of the two soils present a most agreeable bed to the phosphate of the bones, and the gravel and splinters of stones are most peculiarly favourable to the turnip plants, in any form of the fragments of rocks. No other artificial manure succeeds so well as bones; the coldness of the soil and of the climate overpowers the action of guano, which shows that the foreign production of that article likes the indulgence of similar treatment for its action. Farmyard dung suits these soils, as well as all other lands that require manure. It consolidates loose soils, and opens the texture of the hardened and impervious qualities. The climate of Cornwall may prevent the turnips being consumed on the ground by sheep, or no greater improvement can be done on the light soils than raising turnips with bones, and manuring the land by the feet and excrements of the feeding animals. The lightness of carriage of the bones forms a weighty recommendation to the distant localities of any country which do not enjoy the common supplies of manure in the requisite abundance.

The cultivable stratum of earth in these lands never rests immediately on the parent rock, but is most frequently recumbent on a subsoil that is formed very generally of similar materials, but wanting in the consequent results of exposure to the air, and in the possession of the decomposed remains of animals and vegetables. Very often the composition differs most essentially from the upper stratum, showing a greater variety of materials and an earlier deposition. It is sometimes very porous, and more frequently wholly impervious to water; and this quality seems more contingent than the nature of the rock, and more liable to diversity than the upper stratum of cultivation. In primitive formations, the depth of cultivation is not great; and the subsoil being generally very compact, the water is unable to descend, and floats between the hard and soft formations, and very often renders the upper soil wet and damp, and of a very chilly temperature. But that quality is wholly owing to the nature of the subsoil; for in many cases the soil is dry and wet, only during heavy rains and the rapid dissolution of snows. In order to render these lands dry by draining, the tops of the cavities must be near to the cultivable stratum, so that they are not disturbed by the operations of the implements; and this rule may be held as an axiom in all cases of shallow draining, "that the drains cannot be too shallow, provided they are not disturbed." This fact applies more especially to all purely clay soils, and to the thin lands now mentioned, which lie on a very compact and impervious substratum. And the width of ground between the drains may be averaged at 15 feet, and the tops of the drains may be 12 inches below the surface of the ground, which will give room for the furrow of the plough, and does not leave much unstirred earth to form a hardened crust to deny the passage of the water into the drains.

The shallowness of these soils, and the generally high latitude in which they are situated, much restrict the number of cultivated plants that can be raised for the use of the farmer. The coolness of the climate and of the land favours the turnip plant, and the oat is the most useful of the cereal crops. The cold climate debars the cultivation of wheat and barley to much extent, and rye is less adapted than these two grains. Peas and beans are still more unsuitable, and even vetches will not forget the specific liking for deep and warm loams. The oat plant delights in cool treatment, and in a lengthened summer, which does not check the growth of the straw, nor ripen the seeds prematurely into shrivelled husks. The depth of the land does not give room for potatoes or beet-root; and broad clover, except under very good treatment, does not thrive luxuriantly. But in most cases, a tolerable crop of hay may be got from a mixture of red and white clover with perennial grasses, as ray grass, fescue, dogstail, catstail, cocksfoot, and trefoil. These grass plants will secure a good pasture for cattle or sheep for several years, and the rotation of cropping will be:—first year, turnips; second year, oats or barley; third year, hay; fourth year, pasture; fifth year, pasture; sixth year, oats. This course of cropping may be recommended for weak soils of every description, substituting barley for oats in the second year, where the local circumstances are more favourable in the soil and climate. The pasture produces mutton and wool; and during the time of rest in that condition, the soil acquires from the roots and leaves of the grassy herbage a vegetable freshness, which imparts to all the future crops the pabulum of their growth. The success of the turnip crop is chiefly owing to this *freshness* of the soil, and the oat crop to the firmness acquired by the land during the three years of lying at rest. This system of cropping directly lessens the demand for manure, and indirectly increases the quantity of that most useful article.

Slate is a primitive formation, and under the general name of "schist" constitutes a very large variety and intermixture of the primary and the attendant secondary rocks. The massy formation is tabular, the small structure laminar, the cleavage parallel with the tables or divisions, and hence represented as being most distinctly stratified. But this parallelism does not always appear, and the bed is frequently but little elevated, while the laminar cleavage is perpendicular. The general

constitution is formed of siliceous earth, alumina, and iron, in various proportions, and a very intimate intermixture with an occasional portion of lime, magnesia, manganese, and bitumen. The most perfect slate has a glistening lustre, and passes by gradation into the primary rocks, and into the secondary in situation under the name of clay-slate, or shale.

The most crystalline formation of slate constitutes the roofing of houses, containing no remains of animals or vegetables, and on that account reckoned a primary rock. It approaches the surface of the earth in some places of Cumberland and Westmoreland, and more abundantly in North Wales, where it forms whole mountains, both of the first and second degree. It forms the highest type of the Cumbrian system, and ranges along the western border of nearly the whole Principality, and throws off to the east the inferior beds of the subordinate formations. The most indurated quality is very slow of decomposition from the effects of air and moisture, and breaks into small thin splinters, which lie in loose beds, without cohesion or earthy mixture. By degrees, some vegetation settles and dies upon it, and the decayed remains form some earth for mixing with the slaty splinters. A very weak soil is formed, that is very pervious to moisture, and shallow in the depth. The detached valleys of cultivation in Montgomeryshire, Merionethshire, and in the northern parts of the county of Pembroke, are placed on the substratum of slates, that are rendered more or less clayey by the temporary congregation of water. The soils are very inferior; but the climate of these alpine elevations is so very adverse to improved vegetation, as to forbid any comparison of the detrital products of slate with other rocky formations. The localities allow only a grassy pasture for sheep and the use of oats as a grain crop; and in some lower situations, barley and potatoes may be occasionally seen. But if these soils were placed in much more favourable situations, the character of productiveness would not be high, as the natural quality of the thinly laminar schists seems inimical to vegetation. The earthy property is wanting, which forms clay, earth, or loam.

No draining is ever required on the soils that are formed from slates, the land is light and the bottom porous. The crops to be cultivated are few, pasturage and oats in the ratio of 6 or 8 to 1, and turnips as the fallow crop. This observation applies to the higher situations. On lower grounds, the soils are ranked as light loams, and subjected to the treatment of that class of lands.

TRANSITION ROCKS.

These occur as the supporters of soils, of which grauwacke is the first in the series of the classified order. The form is very often slaty, and sometimes thickly tabular. When the portions of the other rocks that are imbedded in the basis or ground of grauwacke become very small, the rock assumes a slaty structure, and forms the "greywacke slate" of geognosts. When the grains almost entirely disappear, and the rock is principally composed of clay-slate, it is named "transition clay-slate." The slate has often a very earthy aspect, which is much beyond what is seen in the primary districts.

The series of the rocky strata of the earth divides at greywacke; from it upwards, all the members are completely chemical, the slaty form appears more or less partially in mica, is nearly lost in gneiss, and in granite the texture is wholly granular, and this rock stands as the first and oldest member of the series. Grauwacke is a complete sandstone —we have a gradation of its grains, from those the size of a pebble until, from their smallness, they are no longer distinguishable, and this forms the "transition or greywacke slate." In the lower formations, the chemical are combined with the mechanical, and only the lowest links of the series are completely mechanical productions. The earthy composition steps in by every gradation upwards, and reaches at last the subaërial deposit, or the upper stratum of cultivation.

The greatest extent of greywacke rock, and its varieties in slate and flags, is found in South Wales, where it occupies a very considerable part of the Principality. It forms the highest mountains of South Wales, and is placed by Sedgwick as the upper member of the Cumbrian group, or the slaty greywacke. Murchison could not find any rock to answer the name and character of the greywacke of the German mineralogists; he abandoned the designation altogether, and also of transition rocks, and made a fresh class of the whole rocky formations under the name of the "Silurian system." He reckons grauwacke to be the upper horizontal layer of the old red sandstone, and it is so treated in the arrangement he has devised. The mountains are not precipitous, but slope moderately upwards; they are ascending rather than craggy, and rounded rather than peaked. On the sides and higher declivities, the soil is coloured as the rock, being a pale earthy red, and is loose and easily moved. The very near affinity to the parent rock is most clearly seen, and the appearance allows no mistake. In lower situations, the subsoil is a very compact body of detritus, often mixed with gravel, impervious to water, and of great depth. The formation varies very considerably in appearance from a reddish earth to gravels and sandy clays, of very different degrees and modifications. In the lowest valleys the same formations are seen with the upper soil

of a stronger nature, from the deposits having been made by longer standing water. In very many situations of these lands, the soil is loose and wants coherence; but it is open, easily wrought, and very favourable to the growth of green crops. The land is cool, and not unduly retentive of moisture; allows the very free percolation of water, and is easily cleaned of weeds. Calcareous matter, the grand support of life, had not appeared at that early period of the globe, or at least very sparingly, and the land wants the calcareous grit to constitute a soil of the character of sharp loam. But in that semi-alpine country, the climate is most outrageous, and the effects of it destroy the natural qualities of the soil, and impose others of its own influence. The heavy and continued rains would wholly prohibit the culture of a heavy viscous soil; if it existed there, it could not be used under the atmosphere. At the same time, they produce the coolness of the soil which favours the turnip crop so very much. The shallow depth is rather unfavourable to potatoes except in the valleys, where more alluvium is found. Spring vetches thrive very well on the best lands, but the winter variety fails beneath the pelting rains of the late autumn, which kills the growth and bleaches the roots unto death. Yet they do succeed in some places; for turnips the soils are peculiarly favourable, and large crops can be raised even in opposition to the awkward climate. For the action of bone manure, they have proved to be most admirably adapted, notwithstanding the coldness of the climate presents an obstacle to the warmth which bones are supposed to require. The writer of this essay, during two consecutive years, on the high cultivated grounds of Brecknockshire, raised crops of white and green globe turnips, that were confessed to have been seldom equalled, and which much exceeded the writer's long experience with bone manure in the counties of Northumberland, Leicester, and Surrey. The bones were mixed and heated with fine earths, quicklime, suds, urine, and water, and sown by Hornsby's drop drill machine. The vegetation was very remarkably luxuriant, notwithstanding a heavy rain fell immediately on the manures being sown, and might have prevented the action of the bones. But the artificial heating of the manure may have overcome the chilling influence of the rain. At all events, the success was most wonderful.

Very many of these lands require draining, as near to the hills springs of water are very common from the gravels and mossy formations, and also issuing from between the layers of the rock, where the ledges or tables extend over the edge of the cultivated land, and the great quantity of rain from the heavens, requires outlets for the superabundant supply of that element. In many cases, the subsoil is impervious to water, and the soil being shallow, the tops of the drains must be as near as possible to the surface of the subsoil, in order to receive with as little delay as possible the water that floats between the land and the under stratum. As mentioned in the case of thin granitic soils, the space of 10 or 12 inches will allow the plough not to disturb the drains and open a ready passage to the water. The average frequency of the drains may be 15 feet.

Oats alone, as a cereal crop, succeeds in these elevated tables of cultivation, barley grows in the better situations, and wheat in some few situations only. The high position and exposure of the lands prevent the use of sheep in consuming the turnips on the ground, which forms a mighty drawback in the profits of turnip farming. And folding is still more absolutely forbidden; but an attempt might be made to procure for these lands the benefits of sheep manuring by means of moveable folds roofed and sheltered on the weather side. Tarpaulin cloths, or rather sheet iron, would form a light covering; and the frame, being set on four wheels, could be moved over the ground regularly, as the turnips are consumed in front of it, and manure the land as by folding, A space of the growing turnips would be staked off, with a road leading to the covered fold, into which the sheep would retire for shelter and repose, and be shut in during the nights. The fold could be moved twice a week, and the land immediately ploughed, in order to preserve the excrements from the desolating rains of that climate. The process of consuming the turnips, and the direction in which the land is ploughed, must lie in the same line. This plan is worth a trial, in order to procure the benefits of sheep feeding on the land.

The transition rocks of the clay slate series supports similar soils to the above-mentioned, that are cultivated or uncultivated, in the counties of Radnor, Pembroke, Merioneth, Denbigh, Carnarvon, and Carmarthen. They show similar qualities in these situations, and are subjected to the same treatment. The county of Cardigan is nearly altogether occupied by hard, indurated, slaty strata of the transition series, which supports a very poor soil, and mostly unworthy of cultivation. The climate is very unpropitious.

These grauwacke derivatives being turnip soils, the best rotation of cropping will be:—1st year, Turnips; 2nd year, Oats and barley; 3rd year, Hay or grass; 4th year, Grass; 5th year, Grass; 6th year, Oats.

Calcarious matter does not appear in the Upper Cambrian or slaty group, and consequently the soils now mentioned are deficient in that very essential element of life and fertility. The grit is

wanting, which confers the quality of sharpness and activity, and conduces to the healthy maturation of seeds.

OLD RED SANDSTONE

Is the next rock that occurs in the ascending order of the transition strata. It rests on the rocks of slate, or grauwacke, and is covered by thick beds of limestone. All sandstones are admitted to have been formed mechanically from the debris of pre-existing rocks, broken down and cemented together; but some sandstones are highly crystalline, and the particles adhere without any visible cement, and granite may also be reckoned mechanical, if the rule be universally admitted. The component parts are similar, and the aggregate formations differ little. The old red sandstone is mostly a coarse conglomerate, consisting of particles of quartz, and sometimes of felspar cemented by iron-shot clay, that gives it the red colour from which the name is derived. The basis is red sandstone, or red marl filled with fragmented masses, almost entirely derived from the neighbouring slate hills. Some of these fragments are quartz veinstone, with micaceous iron ore. The recent elevation of the slate rocks would expose them to enormous waste and degradation, and were rolled to pebbles which were collected into hollows or rude valleys, and reunited by a basis of red sandstone, or red marl, into vast irregular beds of coarse conglomerate. No organic remains are found in this rock. The waters of the sea may have had a particular tendency to deposit near the shores materials charged with red oxide of iron, and a violent interruption of the general quiet production of clays and sandstones may have mixed the products with a vast quantity of the fragments of pre-consolidated rocks, and urged the mass along the lines of dislocated strata, which had already begun to be excavated into valleys. No mineral veins are found in the sandstone of this formation; calcarious spar does occasionally divide it, and often splits the pebbles that lie in the conglomerated bed.

The old red sandstone occupies a limited tract in Cumberland and Westmoreland, and lies principally in patches round the slate rocks. It is more largely developed along the south-eastern and southern border of the slate district of Wales, through the counties of Hereford, Brecon, Monmouth, Glamorgan, and Pembroke. It lies in a large trough, which is flanked by the Silurian system both on the eastern and western sides; the far greater part of Herefordshire is occupied by it, with much of Breconshire and Monmouthshire, and a narrowing tract into the counties of Glamorgan and Pembroke. It appears in the Forest of Dean, in Gloucestershire, and runs from Herefordshire into the county of Worcester, at Tenbury; it is seen in Yorkshire, in the valley of the Rother, very little in Carmarthenshire, more in Carnarvonshire, some in Flintshire, and in Radnorshire. Its thickness is not less than 2000 feet in Breconshire and Monmouthshire, but its lower edge is not always clearly distinguishable from the grey wacke slates underneath. The cap of the hills near Monmouth is crowned with thick conglomerate rocks, full of quartz pebbles, and remarkably analogous to some varieties of millstone grit, forming magnificent precipices and solitary crags. Below is an excellent flag-stone, with one or perhaps two beds of a singular limestone, mottled with red, blue, green, and yellow, sometimes much mixed with clays, and always irregular. It is burned for lime, and hard enough to form road-stones. It contains no organic remains. The lowest part of the section exhibits an extreme abundance of red marls with white and green bands, undistinguishable from those of the new red marl. Cyder mills are made of the upper conglomerates, and the limestone, called "cornstone," is often employed on the roads. Though apparently irregular and fragmentary, the limestone is a most persistent layer; for it accompanies and characterises the old red sandstone along nearly its whole course.

The composition of the red sandstone conglomerate differs according to the nature of the primary rocks in its vicinity. The degree of attrition to which the fragmentary masses which it includes have been exposed, will vary according to the degree and continuity of the aqueous action accompanying the disruption of the primary strata. Sometimes it resembles a granitoid breccia, with fragments of quartz, mica slate, and primary limestones. Certain breccias have a plutonic aspect in the slate districts of Cumberland, which usually, at a small distance, is speedily changed into the usual aspect of a decided conglomerate. If the primary rocks be of the crystalline character, the red stone is seen of the harder nature; and when the primary rocks are slate and grauwacke, the sandstone is softer and more earthy. The fragments of the rocks which are contained in the bed differ in quality by reason of this descent from the native masses, and the bed itself will be affected by the circumstances which would surround its formation in each particular locality. The sediment may have been left by waters long stagnant, or only for a short time collected, or which may have brought extraneous materials from other places, and deposited them in the temporary place of rest. Many causes may have operated to influence the results.

Murchison places the old red sandstone in three divisions:—

1. Quartzose, conglomerate, and sandstone.

2. Cornstone and marl.
3. Tilestone.

The upper part of the rock affords a soil light, sharp, and little productive. In the lower, central, or cornstone group, where the angillaceous bed is mixed with an impure limestone, the disintegration of calcarious nodules, and the admixture of the component parts with the clayey and sandy particles of the other strata, produce the well-known rich, red soil of Herefordshire, where an argillaceous character mostly prevails. The most loamy sorts yield large crops of wheat and hops; the heavier kinds are harsh loams, producing fine oak timber, and often covered with deep beds of gravel and silt. Cornstone supports the best land in the county of Hereford and Monmouth, in the eastern part of Breconshire, and in Salop, with a small portion in Gloucestershire, and in the county of Worcester. It is formed of beds of green argillaceous spotted marls, which alternate with irregular courses of concretionary impure limestone, mottled also red and green. The cornstone is conglomerate and brecciated, and mixed with sand and marl. The zone is mostly persistent, but the three divisions of Murchison are lost in the counties of Carmarthen and Pembroke. The cornstone is distinguished from the new red sandstone, which it very much resembles, by the fragments of peculiar fossil fishes, which belong to the older formations in which organic life appears. Tilestone, or the lowest member of old red sandstone, is little developed as a surface rock, and mostly in Radnorshire. The decomposition is always red in colour, which everywhere distinguishes the true red sandstone from the contingent members of the system.

The Silurian system of Murchison is formed of successive members of the red sandstone group, which rise from below each other in distinct mountainous escarpments. The Landeillo flag is the lowermost stratum, and is chiefly developed at Landeillo, in Carmarthenshire, where it supports a good soil, arising from the favourable nature of the rock. The Wenlock limestone is a transition rock, and little developed in the shape of land. The Caradoc and Ludlow rocks are sandstones, and produce good soils, loamy, sharp, and dry. The colour is grey, and marks the difference from the red sandstone.

The character of the soils is generally good that are incumbent on the old red sandstone, and the associated rocks of the same nature. The lower situations exhibit heavy, harsh loams, which rise through many gradations to the sandy loams of the higher grounds. No draining is ever required, as the bottom is open and porous. The heavy loams are not quick in growing turnips, but will all of them produce potatoes and beetroot. The rotation of cropping may be—1st year, Potatoes, or beet root; 2nd year, Barley; 3rd year, Hay; 4th year, Oats; 5th year, Beans; 6th year, Wheat. Light loams—1st, Turnips; 2nd, Barley; 3rd, Hay; 4th, Grass; 5th, Oats.

On the most inferior sorts of land the rotation may be extended to six years, by making another year in pasture. Farmyard dung suits the heavy loams, and every kind of artificial manures acts well on the lighter kinds of soil.

The old red sandstone marks the commencement of a different condition of the globe from the high temperature during the deposition of the primary strata. It is covered by, and mixed with the grand support of life in the form of limestone, or calcarious matter; before which means being provided, it would appear that no animal had lived; but as it increases, life of every kind becomes numerous and prolific. The organism found in these red sandstone rocks is wholly marine and invertebrate, and it requires another era of deposits to show the remains of vertebrated land animals and terrestrial vegetation. From the latter we learn the state of the land, from the former that of the sea. The primary ranges are mostly enveloped in thick strata of conglomerate sandstones, shale, coal, and limestones; and these deposits begin to assume more local characters, dependent on the varying physical conditions of the particular case. The change in many places, as in Herefordshire, is very gradual from the older slates to the shales and sandstones of the superior group, and unaccompanied by violence, and the organic remains are mostly congenerous. We are called upon to examine, not a new creation, nor even a new system of nature, but another step in the scale of periodical operations, whereby the vacant planet was replenished with life, and fitted for the residence of man.

(To be continued.)

ON THE CULTIVATION OF ROOT CROPS.

SPARKENHOE FARMERS' CLUB.

The quarterley meeting of this society was held on Monday the 9th May, at Market Bosworth, Mr. S. Chapman in the chair. A large number of agriculturists from the neighbourhood were present.

Mr. WORTLEY proceeded to read his paper on the Cultivation of Root Crops, observing that it was with pleasure he met the club for the purpose of endeavouring to ascertain what was correct in principle, and the best methods of carrying it out in practice. They well knew that the art of agriculture was of primary importance to mankind. Its introduction was the herald of the earliest dawn of civilization, and its neglect the forerunner of national decay. With the small space of land occupied by the English people, thorough cultivation was essential to prevent dependence upon foreign sources for food, and the loss of national income; and no branch of agriculture was capable of greater development, or possessed more practical importance, than the cultivation of root-crops. Mr. Wortley then proceeded as follows:—

There appear to be two indispensable primary qualifications for the successful growth of root-crops: the subsoil should be rendered free, sound, and healthy, and the surface-soil reduced, previous to sowing, to a finely pulverized state. We must have deep cultivation wherever practicable, for the atmosphere is the cheapest and the boundless stores house of manure; and it cannot have free access to the soil without efficient drainage. which is an essential and fundamental principle in the growth of vegetables: deep draining and deep cultivation must go hand in hand. First and principally, I will allude to the growth of roots on heavy land, including all those soils which are not classed under the common denomination of turnip soils, because their more general culture on poor clay land is every day becoming a more important and desirable attainment; for though we may apply the best possible manure, and bestow every care and attention in the preparation and cleaning of the land, yet if it rests on a cold, impervious, water-logged subsoil, we shall look in vain to see the crop flourishing with vigorous strength; but, checked and stunted by an unhealthy subsoil, we shall find our hopes disappointed, and our labour greatly robbed of its reward. The earliest possible opportunity, either during or after harvest, must be seized by the heavy-land farmer for commencing operations on his fallows, if he would be successful in growing the nobler description of roots, such as mangel wurzel, carrots, swedes, cabbage. White turnips, it is true, may be sown much later, and therefore they allow much more time for summer fallowing than swedes; but, in my opinion, they are not a crop to be much encouraged at the expense of far more valuable roots. I am no advocate for growing a large proportion of white turnips; indeed, my ambition to possess them does not induce me to trespass further than on the headlands of the fields, where they succeed better than swedes, and can be sown after the horse hoe has been well-worked between the drills of other root-crops.... In every instance, and on all soils, the stubble should be looked carefully over before ploughing, and nettle roots and couch grass deligently forked out and removed. For this purpose, light steel forks (as made by Winton, of Birmingham) are far preferable to the heavy clumsy tools in too common use; they are also much cheaper, for the work can be done more expeditiously, and the repairs are nearly all saved. I do not think it by any means advisable to defer the application of the manure on heavy land until just previous to the time of sowing the crop, because the intermixture of the manure with the soil is more advisable on heavy land. There is little fear of its being wasted by rains; and in many seasons it would be fatal, in all seasons injurious to the crop, to cart it on the land in the spring. Without subscribing unreservedly to the opinion of Sir F. Mackenzie, that one-half the dung laid on early in the winter will be equal to double the quantity applied just before sowing in the spring, I still do think we are more timid than we need be, about carting on the manure at a long distance from the crop. Professor Way's discoveries of the very extraordinary absorbent powers of soil, especially of clay, must strengthen our confidence in the system.

I have never experienced nor witnessed great success by growing turnips on the flat on heavy land, although I have practised it some years. The following is the plan I intend adopting in future, until I find out a better:—First remove all patches of couch grass and other roots by forking, throw the field up in 27-inch ridges as soon as convenient after harvest, subsoil ten or twelve inches deep between every ridge, cart out the manure from the yard and spread it between the ridges, split them back, and again subsoil same depth as before, and leave them until the time of sowing. By no other means can a great portion of the soil and subsoil be exposed to the chastening, purifying, and fertilizing influence of the changing weather. The surface is greatly exposed to the frost, and the stiff and waxy subsoil is gradually converted into a useful additional store room for nourishment to future crops. The stale furrow, too, will give every advantage that results from a good and fine seed-bed. If not absolutely required to restore the ridges, in most cases for the purpose of destroying a few weeds, the double mouldboard

plough will be required before drilling; and it will also give the field a cleanly and business-like appearance. For though no tenant farmer can justify imprudent expenses in unnecessary work on a farm for the mere sake of appearance, yet it is well always to have an eye to the neat and workmanlike finishing off of our fields. And certainly no crop gives an idea of slovenliness so completely as a badly managed and foul turnip crop; nor, on the other hand, can anything be more pleasing to the eye and beautiful than when autumn comes with her golden train to see the luxuriant leaves of the swede and dark rich shade of the mangel scarcely concealing their equally luxuriant and well-grown bulbs, uninterrupted either by straggling weeds or vexatious gaps. "Show me a man's companions, and I'll tell you his character" is an old saying and a true one. I think if we borrow from the idea, and say "Show me a man's turnip field, and I'll tell you what sort of a farmer he is," it would be an equally faithful remark.

I am not aware of any important difference required in the preparation of land for carrots, potatoes, cabbage, mangel, or other roots: the ridge system is suitable for any of them, but the 27-inch distance is too great for carrots. This can be remedied either by growing cabbages alternately with carrots, which will fill up the spaces between the drills, or by autumn manuring and flat ploughing and scarifying to incorporate the manure, and then forming the ridges at 18 inches wide instead of 27. But the great secret of success is autumnal manuring and cultivation, in order that in a fine and suitable seed-bed we may secure a plant early in spring, and get the crop removed and preserved early in the autumn, to be succeeded by wheat or other grain. There is an old Spanish proverb that "wherever the foot of the sheep touches, the land is turned into gold;" but we must be careful to apply the feet of the sheep and the manure of the sheep when we may lose none of their advantages.... I therefore, acknowledging the force of the Spaniard's figurative proverb, prefer grazing the seeds with sheep on heavy land during the summer months, supplying them with a small portion of oilcake, and taking oats and wheat as the two subsequent and last crops in the five-field rotation. Thus the land is in no danger from injury by treading with sheep in wet weather, and we get the benefit of their manure for a much longer period by feeding them on the seeds during the summer and autumnal months. The 27-inch distance between the ridges is convenient for admitting the manure carts readily between the rows at the different stages of preparing for and harvesting a crop, and it admits the working of a horse-hoe to great advantage, which I do not think can be so deeply or effectively performed where narrower distances are adopted. Drilling on the flat seldom exceeds the 18 inch width, and is generally less, and this entails great expenses in hand-hoeing—frequently, to my knowledge and cost, where land is very subject to annual weeds, exceeding 20s. per acre. Now, we are told that we are not likely to be overwhelmed with labour. The emigration to Australia and other colonies, and to America, may probably cause labour to be at a premium for some time in England. But, independently of this consideration, the system which will bring as much or more weight of keeping at a less cost must be preferable, and certainly the application of the horse-hoe to the turnip fallows is an expeditious and economical mode of destroying weeds, and we are both justified and compelled to adopt every useful implement and mechanical invention which will cheapen the cost of production. Mangel wurzel seed is difficult to distribute with the common drill with sufficient regularity; I therefore prefer dibbling, and make use of a dibbler consisting of two iron wheels about three feet in diameter, which can be set to any required distance between the ridges. In the wheels, iron nobs are screwed, which can also be arranged so as to make the holes at almost any required distance apart. The knobs are broad at the base and tapering, so that the holes do not fill up after the dibbler has passed over the ridges. By having a light pair of shafts attached, one horse will dibble ten acres a day, and then, if artificial manure is used, a boy follows with the requisite quantity, and another with the seed, dropping three or four in each hole; a light rake then finishes the work in a very perfect manner. It needs no remark to point the advantage of using the hoe soon. The war against weeds in root crops cannot be waged too soon. The hoe which is death to them gives life and vigour to the crop. It is always most important that the first hoeing should be well done; if the weeds get to be strong at the second hoeing, the young plants are certain to be injured—a young plant being frequently removed, and a blank left in the drill by the weed and plant being drawn away carelessly together.—(The lecturer here advocated the carting of the manure *direct*, from the farmyard to the land, and ploughing it in at once).—After subsequent stirrings to thoroughly incorporate it with the soil, and sowing, directly after ridging the land, 2 cwt. of guano and 2 cwt. of superphosphate of lime per acre, the seed should be drilled. The ridge, or Northumberland system as it is commonly called, is best adapted for the light land cultivation of all roots, to which we will now briefly advert, and introduce them by a quotation from a paper by Mr. Grey, of Dilston, on the best time for the application of lime to the land:—"Turnip cultivation is the branch of rural economy in which this district (Northumberland) peculiarly excels,—which exerts by far the greatest influence upon its prosperity—and has produced the greatest effect upon the value of the land, and the well-doing of all who possess and are connected with it. The process of preparing land for turnip sowing is so nearly the same in all districts as scarcely to require notice; when lime is applied, it is frequently spread upon the stubble soon after harvest, and ploughed lightly in, which ploughing is succeeded by a deeper one in a contrary direction, by which the lime is intimately mixed with the soil without being placed too deep, to which it has a tendency; by applying it at this season less work is left to be done in spring, when it is of more importance, and the risk of injuring the growth of the plant, which sometimes follows the application of quicklime in

a dry season immediately before sowing, is avoided."—(Mr. Almack's testimony in favour of early first-ploughing, and *liming* grass-land immediately before ploughing, if it did not require paring and burning, was also quoted by Mr. Wortley, who added his approval of the plans suggested).—Whatever may be our supply and quality of farmyard manure, or however largely and wisely we may avail ourselves of superphosphate of lime, or any other concentrated manure, yet none of these appliances will stand in lieu of those frequent stirrings of light land which expose it to the air and reduce it to a sand-like state; and without accomplishing this, the crop cannot obtain the full benefit which otherwise it would derive from whatever manures are applied. Nor is it a small advantage that we derive from the active pretty little wagtails, and other birds, which, whenever we disturb the soil, are unusually diligent after their insect food, and thus prevent much of the mischief which would otherwise result from these unseen but often most destructive enemies of our crops. *The feathered tribe need more protection than persecution from the farmer.* The benefit we derive from them in the destruction of vermin and insects is incalculable; the damages which they are apt to occasion at particular seasons may always be guarded against. A farmer occupying both heavy clay and light turnip land, as in my own case, would, I presume, first move the clay, and then give the lighter soil its first tilth, and if sufficiently deep in soil to prevent coming in contact with rale or stone, it should be subsoiled after the common plough. Then, having given the necessary ploughings and scufflings, generally two of each, to thoroughly eradicate and destroy all weeds, which after harrowing will always require hand-picking—no better system can be adopted, I believe, than ridging at 27 inches....It is my practice to apply all the manure the farm produces to the root-crops, and to give them, in most cases, some artificial help in addition. It is, therefore, as a matter of course and necessity another rule, that I never apply farmyard manure to any other crop, although farming on the five-field system. But I am told a different custom prevails in some parts. It is thought better to divide the manurings. My answer is, that I can't get more than enough for my root crops. I like to put on the turnip fallows at least twenty loads of manure per acre, and when I have done that I have done all. The yards are empty. And I contend that for root-crops we cannot manure too heavily, and it should always be applied, I think, to green and not to white straw crops, for which the land should be in such condition as not to require the direct application of farmyard manure. There is an evident distinction between the principle of culture for green and white crops. By applying farmyard manure, rich in organic matter, to wheat for instance, we well know that we should generally cause such a development of straw as would greatly injure the crop. Grain crops, in short, are not valuable in proportion to their weight, but to their quality. The reverse is true of green crops. They should have all the manure from the farmyard, for they are valuable in proportion to their weight. When have we seen too great a bulk of clover brought to the stack-yards? Whoever complained of having too heavy a crop of swedes? or grumbled in May that his mangel wurzel had taken so much carting in October? Without needlessly losing time with allusions to the many experiments testing and proving the value and importance of artificial manures as a help to the farmer, I will state my belief, that their *general* use, in conjunction with farmyard manure in the growth of root-crops, is highly advisable and beneficial, and more especially on all farms devoted to the breeding and rearing of stock. A continued course of fertility, and a large return of produce, cannot reasonably be expected, when we are continually selling off grain and stock from the land, and returning to it simply the decayed remains of its most inferior production.

I can scarcely think, especially when I remember the vast cheese-producing country I am now in, that Mr. Caird does the Leicestershire farmer justice when he says, and as I read it broadly and generally, and not in relation to one particular farm, that "no guano or other artificial manure is used." Is it then true that the talk about the second-rate grass land of Leicestershire is all a fable?—that its cold clays exist only in idea and are nowhere to be found?—that you are all living on those green spots in sunny places, where the natural fertility of your land is so great, that the rich deposits of guano, and the equally effective scientific preparation of superphosphate of lime offer to you no advantages? If Mr. Caird is correct, your practice is antagonistic to the best farmers in the world. It would condemn the Puseys, the Outhwaites, the Hudsons, the Hutleys, the Norfolk, the Lincolnshire, the Lothian—in fact, the best British farming. When we know from faithful experiments that 3 cwt. of Peruvian guano, or 4 cwt. of superphosphate of lime alone, will often produce a heavier crop of swedes than fifteen loads of farmyard manure, it cannot be true that you entirely refuse to accept the services of such valuable assistants. The economy in the carriage of powerful concentrated manures is a most important consideration, and I consider Peruvian guano and superphosphate of lime the most valuable artificial manures for the increase of root-crops. They were used on almost every farm visited by Mr. Caird in his tour, and in the prize essay on superphosphate of lime, in our *Agricultural Journal*, I perceive that the writer remarks that it is the *essential manure for turnips*, whilst we have the high authority of Mr. Lawes, that in England it is a *certain* manure for root-crops. I do not consider it advisable to drill guano or other highly-stimulating manures in immediate contact with the seed—nor even in those excellent manure drills where the manure is first deposited and covered by the fine soil falling in after the first coulter. I have also a strong objection to drilling large quantities of ashes with turnips, having traced in several undoubted instances their decay to this cause. Superphosphate of lime may safely be drilled with the seed, without any fear of injury, but I much prefer mixing it with equal quantities of virgin soil—brought generally from soil thrown up under the hedge sides in grass fields—to using ashes. It is,

perhaps, their very quality of absorbing moisture which, later in the year, tends to decay the bulb. It is said that drilling ashes gives to the young plant a great advantage by forcing its rapid growth, and getting it out of the danger of fly; but surely the best security against the turnip fly is to have the land brought, before sowing, into such a beautiful state of preparation, that the soil itself shall supply abundant moisture to carry the plant past the fly. I would recommend guano to be applied either before the last ridging, and immediately covered in with the farmyard manure, if any is used, or to be sown broadcast after you are safe of a plant, and stirred into the soil after the first application of the horse-hoe.

Having, by diligent and expensive management, obtained a good crop, it will be worth while bestowing much pains in rightly preserving it. All roots are undoubtedly much injured in their quality by frost; therefore, to secure them from exposure to its influence must be necessary. Mangel wurzel requires our first attention, it being peculiarly susceptible of injury, more especially if stripped of its lower leaves, and on heavy land frequently requires to be removed, and the leaves ploughed in for wheat. The greatest care is required to prevent cutting or bruising the bulb. The top should be twisted off, but not very close to the crown, and I would never allow anything but the back of an old sickle, or other blunt instrument, to touch any bulbous roots I intended storing for spring use. No better mode for removing the crop from the field can be adopted than that recommended by Mr. Raynbird in his valuable essay on mangel wurzel....The whole of the roots being removed from the heavy land for a succeeding wheat or other corn crop, and about one-third being the proportion drawn from the lighter soils, these are carted to headlands in the fallow field, or to any other convenient place, for future use, either in the yards or for the ewes or other sheep in the grass pastures. This is a great convenience in very wet weather, when the turnip sheep require removing from their lair to grass land. They thus get a wholesome change of food, and we save the damage of carting turnips for them off the ploughed land in a very wet time. But I find the quantity of straw required to cover the heaps is a great objection to the system generally recommended, and I believe it may be safely dispensed with. Choosing a fine day for the work, and allowing the heaps, containing two cart loads each, to remain until afternoon before commencing to cover them, we dig a trench deep and wide round the clamp, and simply throw the fine and mellow soil over it. It runs in between the roots, and preserves them in a beautifully moist state, and I have found they are as well saved by this as by any other mode. Care must be taken to give them a sufficient covering, say eight inches of soil, and to leave a slight opening for some time at the top of the heap. I once, and only once, tried the method of preserving them recommended in the prize essay of the Royal Agricultural Society's Journal, by simply stacking between hurdles and protecting with straw and thatch, but although in length and breadth and height and every other direction I faithfully and zealously followed the instructions, yet I found the turnips in the spring had become pithy and soft to touch; whereas when preserved in soil I found them moist, crisp, and also greatly preferred by stock to those which have stood the severe changes of the winter, and they must undoubtedly be better food than either frozen or dried up turnips; for let agricultural theorists say what they may about the large proportions of water in the swede, I well know that beast infinitely prefer a gallon of its fragrant juice to going to the trough for a similar quantity of cold water.

The introduction and very general application of artificial manures has certainly diminished the difficulty of obtaining a plant of swedes, but still I think on light soils we should draw very few to the yards, but consume them on the land by cutting for sheep; that portion, say one-third of the fallow, which we require for beast and other purposes, should be planted with mangel wurzel, carrots, cabbage, or other root-crops, taking care that in each year they have fresh portions of land allotted to their growth.... From the last week in April till the middle of May is considered the best time for sowing the crop, perhaps the latter period is best on warm dry soils where the plants are more apt to run to seed than on heavier land, which is in fact better suited to their growth than sharp thin gravelly soil. Carrots are not much cultivated. I have grown the white cattle carrot, and find it an excellent cropper and most valuable root. The old purple top swede is not in such general favour as formerly, it being considered rather too tender for the winter. But considering the injury to the quality of the root and the great loss occasioned by the depredation of crows and pigeons, and perhaps hares and rabbits, we may well ask ourselves, ought any swedes to be allowed to stand the winter? I am certainly partial to the purple top, and grow a greater weight per acre of it than any other variety. Skirving's, perhaps, will grow more gross weight, but I have never tried the experiment. I think them too coarse for high cultivation. I noticed a neighbour's crop of what were said to be an *improved variety* of Skirving's in an excellent field of well-managed land, and I estimated their proportions at *twenty-five tons of tops* and twenty tons of bulbs per acre! Laing's is deservedly a favourite and much grown, and another variety called the Toadback swede, and introduced by the late Mr. Umber of Warwickshire a few years ago, is an excellent and most nutritious turnip, and considered by all who have grown it to be the very best turnip we can grow. The time of sowing varies according to soil; we dare not venture on our sharper turnip soils until near the middle of June, fearing the mildew, from which we are very apt to suffer considerably if we sow earlier. But on heavier soils and on clays the middle of May is not too soon if the land has been duly prepared.... Situate as our exposed and variable climate is, between the 50th and 59th degrees of north latitude, with the ground subject to be covered with snow, or frozen hard, or deluged with wet for six months out of the twelve, with a large proportion of second-rate land, growing the most inferior of our productions, *poor innutritious grass*,

and with a vast extent of positively bad land, contributing in any season but little to the general store of food, the necessity of providing a rich supply of winter food must most necessarily be a paramount matter of consideration. Nor is it in winter alone that this reserve is needed. From November till May the stock farmer must ever bear in mind that he is dependent in a great measure on the previous summer's growth for the chief maintenance of his flocks and herds, and we must feel to day—and although we have now arrived at the second week in nature's rejoicing month of May, yet we must have felt for the last week very forcibly the truth of the poet's remarks that—

"Winter oft at eve resumes the breeze,"

and if we have still left a good reserve of the now more than ever valuable mangel wurzel, we have also often felt ourselves most fortunate indeed. The value of that root at this or a later period to a breeding, or any other stock farm is incalculable. I remember reading an account of a Farmers' Club meeting, where one member stated that in the middle of June he turned 95 tegs into a beautiful piece of tares, having previously filled the troughs with cut mangel wurzel, and 90 of the sheep cleaned up the mangold before touching the vetches. Root cultivation is, in short, the farmers' sheet-anchor and the nation's safety-valve. If we build a house on a poor foundation, the labour of the superstructure is wasted, and unless we commence farming by endeavouring to produce great green crops, we shall find our future success and stability very uncertain indeed.

Look where we may over our country, we can trace the progress of improvement hand in hand with turnip culture. Dunstan Pillar—a column 70 feet high, erected almost in the memory of living man, and lighted for the benefit of the unfortunate benighted traveller—now stands a useless monument, surrounded by luxuriant cultivation, well-arranged farms, and flocks of sheep almost unequalled. It resembles a dead stake driven into the river's bank, serving no other useful purpose than to mark the rapidity of the stream. This glorious change from dreary barrenness to rich fertility is mainly due to the introduction of turnip husbandry, which is, in truth, closely interwoven with the progressive development of all agricultural improvement. Population, we know, fast increases; the prescribed bounds of our territory cannot be extended. Is it not then an imperative demand upon us to extend the production of food by every means in our power? It strikes me that too much of our poor land is allowed to remain in grass. This is, perhaps, very much a Leicestershire question, and I mention it more to elicit information than to suggest a proceeding. But we have, I suppose, about 15,000,000 of acres still under grass, and sad stuff a great deal of it is. There was a time in England's history when the price of wool tempted the owners of land to convert it into pasture, but this was in a dark period of our history, and when our population did not reach one-eighth of its present amount. I think a different course will be recommended by this club. Of all our cultivated plants the natural herbage of inferior land stands lowest in the scale; the cereal crops, with their nutritive seeds, are food for man; whilst the rich vegetable bulbs, the potato, the carrot, the mangold, and the turnip especially, are food for man and beast. They afford an abundance of provision, and provide for the employment of useful labour. Then the question I would ask is, why do they not more generally supersede the worthless grasses natural to poor *woodland* and poor clay soils?.....(Mr. Wortley sat down amidst great applause).

Mr. NOEL remarked that all would agree with him, that they had had a most excellent practical discourse on the subject; that it was not wanted in the neighbourhood could not be said. On the heavy land of which he had the management there was hardly such a thing as a good crop of turnips grown. One farm, but it was not a heavy one, did grow a good crop last year. The turnip-crop had been called with some justice a landlord's crop, because it was so expensive. Mr. Wortley advised the application of 20 loads of farmyard manure per acre, which, at the moderate estimate of 5s. per load, was £5. He (Mr. N.) fed some two or three years ago, a fine set of animals. They were fed with his own hand morning, noon, and night, on oilcake and turnips, because he wanted to prove whether he should get back the money for the oilcake. The beasts were sold at a good price; but he found that he must lay down £34 on the manure made from the cake, if he was to get paid at all. He drew the whole of that manure, which should have been worth something without the oilcake, for ten acres of turnips. The labour expended upon growing the turnips was £16, which added made the whole £50. He fed a number of sheep on these turnips, which just kept them 32 weeks, and their keep at 6d. a head a week, made about £45. He also had an acre of mangel wurzel; which at £5, just made up the £50, leaving nothing for rent or rates, so that he had to clap two years' rent and rates upon the next crop. That was barley, and amounted to £93. Taking off that two years' rent and rates, and the extra labour, and charging for the manure, he was no gainer either one way or the other; so that the farmer had something against them, when they asked him to grow a root crop. Mr. Wortley did not tell them whether he meant wood or coal ashes, which differed greatly in their qualities. (Mr. Wortley: Vegetable ashes.) He thought the plan of dibbling the best that could be hit on, but they had not been told whether the seed was dropped directly on the manure. (Mr. Wortley: On the manure. I should not if I used guano.) All the remarks were so practical, that they appeared such as the farmer should constantly keep before him. Turnips could not be grown without deep cultivation, and everybody who had tried the forks must admit their

usefulness. He was himself perhaps too fond of new things, and was never satisfied with anything old (applause). He liked to go onward—to think beyond what he was doing—to drive at something he had not got. In the cultivation of root crops, he thought they would agree with him, that they must do something more than make crops and expense balance each other. He was very much surprised lately by seeing a most extraordinary mode of cultivating root crops, adopted in Northamptonshire, Mr. Smith's yard cultivation which they had all heard of with relation to wheat. Mr. Smith affirmed that the leaves from one root to another absolutely met, though there was a yard space between them. The land was double dug with the fork, and highly manured. In another year the crop would be on the vacant ground. The new idea of this was always exposing fresh subsoil to the atmosphere, creating as it were fresh soil. Soil which was stiff, cloddy, and hard, had been brought by this means to the finest possible tilth. He had tried this last winter on a small piece of land in the parish of Elmsthorpe, which lay in a plantation, and had been shallow drained many years ago; the surface soil was yellowish clay. He had this drained four feet deep, and a portion double dug. The trees were removed because they would not grow, and the land was pared and burnt to get rid of the twitch, which would grow. Nothing was sown the first year, and this beans were planted, a yard between the rows. He did not suppose that any agriculturist who had been there before, would think he was walking on the same soil. The real secret was that here the subsoil was full of carbonate of lime, different from the top soil, and that was turned up to the surface. Next year the crop would be grown on this soil. It was certainly a question whether that would not be found on heavy land the cheapest mode of growing turnips. The great difficulty in growing turnips on heavy land was to do it at a reasonable cost. Artificial manures, he believed, were very little used on the land which he looked over. As to light land, all had been said that could be said, and if they kept it in mind they could not grow a bad crop. The novel idea was in drawing out the manure in the autumn, to do which there must always be a year's manure beforehand. How was that protected in the summer months? (Mr. Wortley: It was left in the yard, neither protected nor thrown up.) He had never tried manuring himself in the autumn for light land; but he tried an experiment which surprised him the other day, in sowing guano on light land in the autumn. He was told that it would be all washed out, but on the contrary the land never grew such a crop of wheat. He used 2 cwt. of guano, and the wheat was nearly 6 quarters to the acre. With manure, he should either leave it in the yard, and draw out to plough in at once, or in such weather as they had lately had, should draw it out and cover down with soil. He found that when manure had been covered down with marl, it was just in the state he would wish it to be.

Mr. HARRISON said he had the pleasure of an acquaintance with Mr. Wortley, of Ridlington, who evidently understood the growing of turnips. But in that county, on the red land, he had seen flock after flock of sheep with turnips, which showed there was no difficulty in getting them, and he believed he could do it there (applause): but it was hardly pleasant for farmers in Leicestershire, living on cold clay land, to see such things and come back again. Where he was situated they were always, unfortunately, a month behind the rest of the world at harvest. That land could not be got ready with the same facility as that in warmer climates. By the time the harvest was got in, it was necessary to see about the wheat land being got ready. Sometimes, as last season, wet set in, and some wheat land had to be seen to in spring. At this time the turnip fallow of his farm was lying in its winter state, and getting tolerably green with twitch and weeds (a laugh). This would have discomposed him some years ago, but did not now. About four years ago, he made a great mistake in importing a man from Scotland, who assured him he could get him a good crop of turnips, but went about it in the most extraordinary way, so that people said the man was mad and the master not much better (a laugh). The land was just harrowed over, ploughed up, immediately ridged, and the manure and seed put in. The twitch lay in heaps upon the ridges, and was very frightful to look at, no doubt, (a laugh) but the result was a very good crop of turnips. He had pursued a little different plan himself; he put in the horse-hoe, and put in the turnips among the twitch, leaving them to see which got master. He showed some good turnips last year. The chief thing was getting 27 inch ridges and using the horse-hoe between. In manure the chief thing was plenty of cake, and the manure should be drawn into heaps, carted over to make it solid, and turned over about a week or ten days before spreading. To let it lie in the yard to be trampled about by the cattle, he could not recommend. He just wished to make one remark about poor land: a great deal was allowed to remain in the same state from year to year, gradually getting worse. He knew there was land within five miles, that if shut up at May-day, or even Christmas, and mown at the end of July, would not cut a load on three acres. He had seen that upon his own farm. Why was not that land turned the other way upwards? "O,"

it was said, "if we get a bad tenant he cannot make this a deal worse, but he would if he ploughed it." He thought there wanted a better understanding between tenants and landlords through the country. If the tenant did not farm well, he should be sent about his business, and if the landlord did not do his duty, he should be served the same. It was the duty of all to grow the best crops they could. Some land was better than other land for turnips. Some in the neighbourhood of Bosworth was pretty good; but a great deal extending to the north-east was of very little use, and would not remunerate the farmer in the average of years.

Mr. H. CHAMBERLAIN moved a vote of thanks to Mr. Wortley for his kindness in coming so far to open the discussion.

Mr. CHOICE seconded the motion.

The CHAIRMAN, in putting the motion, stated that he had received a letter on the subject under discussion, giving the details of the best mode of raising turnip seed.

Mr. WORTLEY thanked the meeting for their kindness. He was not aware that anything had arisen in the discussion requiring notice, except that he might suggest that their friend Mr. Harrison, should give them a paper at the next meeting upon the advantage of growing swede turnips and twitch in conjunction (applause).

The CHAIRMAN stated that he had received a letter from another member, making a number of inquiries as to the use and virtue of Irish moss.

Mr. NOEL said he should have a few words to say on that subject. He had not used Irish moss to any animal but horses. He had about ¼ lb. put in a gallon of water, and boiled, then strained and the moss thrown away. The liquor was then given to a horse. The animal that had had it, was a broken-winded horse, about seventeen years old, and since he had had this, gentlemen would scarcely believe his age. He did his work well, hardly coughed once in a week, and his flesh was firm, and plenty of it. He came across a little thing the other day, which struck him very much. Two horses employed by a miller were always in very excellent condition. A stranger asked how it was they were so fat, and was told by the man they had nothing but hay. He thought there must be some mistake and asked the master what he gave them. The master made the same answer, but said that the horses always drank warm water. This made him think that animals, particularly horses, should not have cold water. He had had a cow, which had recently calved killed by being turned out of the cow-house and given cold water, contrary to his orders.

Mr. CHAMBERLAIN moved, and Mr. WORTLEY seconded a vote of thanks to the Chairman, which was carried unanimously, and the meeting broke up.

DISSOLVED BONES.

There is every appearance at present that the supply of Peruvian guano this season will be inadequate to the demand. It is understood that a number of cargoes are on the way to this country. A proportion of these will arrive too late to be available for this year's turnip crop, and what does come forward before the middle of June will be eagerly bought up. Although the importers may not raise the price, they are unable to furnish the retail dealers with sufficient supplies to meet the demands of their customers, and in such circumstances it is needless for the farmer to indulge in the anticipation of getting it about the old rates. In all mercantile commodities demand and supply, or, more correctly, the opinion that is entertained of demand and supply, must regulate prices.

The agents of the Peruvian Government deserve, to some extent, the thanks of the agricultural community for their endeavours to keep down the price of guano. But while we are thankful for their exertions, the fact need not be overlooked that it is very much their interest that a great rise should not take place. Such a rise would operate as a powerful stimulus to scientific men and manure manufacturers to find substitutes for guano; and if the short supply at present should lead to a useful result of this nature, the high prices will be less a matter of regret.

Of the various portable manures with which we are acquainted superphosphate of lime is, after guano, by far the most important in the growth of turnips, and it is, each successive year, used in greatly increased quantities. It is composed of sulphuric acid and phosphate of lime, and is made from a number of substances, the principal of which are bones, bone-ash, animal charcoal, Saldanha Bay guano, coprolites, fossil bones; and mineral phosphates from Spain and the United States. The superphosphate used in Scotland is chiefly from bones, and though a distinguished chemist, Mr. Thornton Herapath, appears to consider that from coprolites equally valuable, we decidedly prefer the former. When coprolites, or other phosphatic fossils, are merely ground, and not treated with sulphuric acid to render the phosphate soluble, they are of little value as a manure; and it is plain, therefore, that if any portion escape the action of the acid it will continue to be all but worthless. It is different with any small fragments of common bones which may remain undissolved, as the soil speedily brings them into a condition for being food for plants.

There is nothing to hinder farmers from preparing superphosphate of lime for themselves. By doing so they have the double advantage of being sure of the quality, and of having it at a cheaper rate. Such a plan is surely preferable to exposing themselves to the vexation and annoyance of waiting for cargoes of Peruvian guano at high rates, and perhaps having to delay sowing longer than they would otherwise incline. And it is beyond comparison preferable to purchasing any of the spurious substances which are at present plentifully offered for sale throughout the country. To our agricultural friends we say now more earnestly than ever—take care what you buy

under the name of guano, and deal only with merchants of undoubted respectability.

For the guidance of farmers who wish to make superphosphate of lime for themselves, and who are unacquainted with the method of doing so, we give a few practical hints, chiefly from the writings of Professor Way, and from a paper of the Lockerbie Farmers' Club, drawn up, we presume, by an enlightened agriculturist, Mr. Stewart of Hillside.

A pair of substantial water-tight tubs may be got by cutting a large barrel across the middle. Into these the bones, the more finely ground the better, are put by weight. The tubs may be filled with bones to within fifteen inches of the brim. Moisten the bones with fully one-fifth their weight of hot water from the rose of a watering can, turning them over carefully so that they may be equally saturated. As soon as this is done add the sulphuric acid, in quantity from 40 to 45 per cent. of the weight of the bones. The acid must be very cautiously put over the bones, to avoid danger to the hands and clothes. As soon as practicable stir up the bones with a fork, to make sure that all the bones come into contact with the acid. In doing this stand to the windward of the tub, to lessen the danger from the effervescing liquid. After the bones have been carefully turned over, the tub may be covered with an old cloth to preserve the heat, and left 24 hours, by which time the process should be complete.

If raw bones are used instead of bones that have been boiled for the purpose of extracting the fatty matter and gelatine, ten per cent. less of acid will be sufficient. It is of importance to attend to this, as the acid is much the dearest ingredient, and when more than enough is used, it is completely lost—its only use being to render the phosphate soluble. Oil of vitriol is commonly used, but brown acid is more economical, though from some reason or other it is not so generally approved of. The strength of oil of vitriol and of brown acid, or, in other words, the amount of pure sulphuric acid which either of them contains, is known by their specific gravity. In Professor Way's calculations he reckons their weight as 1·7 compared with 1 of water. If brown acid be used, about a fourth more quantity is required than oil of vitriol.

Unless the bones are moistened with a larger quantity of water than half the weight of acid they should not be difficult to dry for the purpose of sowing. Any dry absorbent substance which does not contain much carbonate of lime will do for mixing with the superphosphate after it has been a day in the tub. A layer of ashes, or, failing that, dry sawdust, may be laid on the floor beside the tubs, six inches deep. Upon this layer place a quantity of the dissolved bones with a spade, then another layer of ashes or saw-dust, alternating with the bones until the tubs are empty. "The compound heap is now sliced down with the spade, a little at a time, and thoroughly mixed and made small with an iron rake. After having gone over it once the same process should be repeated immediately, or at any convenient time hereafter, adding more ashes or saw-dust if it is not dry enough, after which it will be in a fit state for sowing."

In calculating the amount to be applied to the crop, if the compound contain, say a ton of bones, it may be regarded as equal to 28 cwt. of Peruvian guano. When the bones are prepared for light land, it is advisable to use a rather less proportion of acid. The process is thereby cheapened; and if small fragments of bones remain undissolved, they are highly useful in that state for sustaining the autumn growth of the crop.

TURNIP DISEASE.

Having adverted to the indications of some disturbance in the healthy condition of the turnip plant, as evinced last year, and which it will be well to anticipate, and experimentalize upon, if it make its appearance this season, we cannot more opportunely advert to the cultivation of the turnip, and especially the swede.

In ordinary soils experiments have abundantly shown that superphosphate and guano are amply sufficient to grow an average crop of turnips, without any other manure whatever, simply because most cultivated soils contain carbonaceous matter enough in their composition, and the soil is most denuded of, and most deficient in, nitrogen and phosphoric acid—not to say sulphuric.

But the perfection of turnip cultivation—as has been shown by the Scottish agriculturists in sets of experiments running over a series of several years—is in growing turnips with farm-yard manure, superphosphate, and guano—all on the same land. For instance, assuming that a farmer had just farm-yard manure sufficient to apply to one-third of his land intended for turnips, instead of spreading it on that third, he should distribute it over the whole, and do the same by the superphosphate and guano which he intended for the remainder of his land.

But will not excessive forcing of the turnip tend to injure it? May we not over-stimulate the bulb, and so ultimately injure the plant in its very constitution? These are rather serious questions, coupled with the tendency manifested last year. Full well we know this applies to some plants with considerable force. The potato suffered most when the land was the richest, and was the most free from disease when the soil was but poorly manured. The wheat suffers far more from mildew when the soil is in a condition stimulating its growth to the utmost; and there is a lurking feeling amongst many farmers that guano-manured turnips seem to manifest a tendency to rot, unknown to those which have had a less stimulating manure applied to them.

The members of the Annandale Farmers' Club, alive to the tendency to disease, observe:—"Though diseases may be said to be more *apparent*, and perhaps more *extensive than formerly*, the club think it very possible they *may* proceed from the peculiarities of the season, and not from any increasing liability in the turnip crop generally to disease in the district." Mr. Martin, their surveyor, enumerates three distinct diseases to which they are subject. The first

fingers-and-toes is well known amongst those who have long cultivated turnips on one kind of soil. The second he calls "a species of this disease"—in most fields prevalent to the extent of destroying one per cent. of yellow and white turnips, "but in a few to the length of five to ten per cent." The third disease he mentions is "the black crack," which we are sorry he does not particularly describe, but which we imagine is identical with what we illustrated so particularly last week. This he mentions as being accompanied with "a partial disease of the bulb," and being "confined to swedes, and more extensive than usual, but generally from two to five per cent., though occasionally greater."

The shrewd and clever members of the Kelso Farmers' Club speak incidentally of the disease. Mr. Oliver, of Hardacres, found that his turnips dressed with sulphate of ammonia and ground bones, and those dressed with sulphate of ammonia and guano, had "a good many decayed turnips among them." Mr. Rutherford, however, of Drailingtofts, observed that those dressed with dissolved bones alone, and those manured with ground bones and sulphate of ammonia, were very bad; and the same of the Peruvian guano; while those manured with sulphate of ammonia and an inferior kind of guano (Letham Island) were good. But it is remarkable that in the whole of the cases where farmyard manure alone is used there is no complaint of disease; nor, let it be remembered, is the weight per acre—from this cause possibly—inferior in scarcely a single case to that of any other manure whatever.

Before we leave this part of the subject we cannot omit to notice the tendency of the experiments made by Dr. Apjohn, the Professor of Chemistry in Trinity College, Dublin, who has examined a great many kinds of root crops, with a view to their chemical constitution, and has given an entirely novel aspect to the question of root culture. He found that, other things being equal, the *largest bulbs of whatever kind* contained the largest percentage of nitrogen. With the mangolds and beets this was quite uniform; but with the swedes more or less general. Still the question arises, were they constitutional or accidental? Does it originate from the fact of a greater supply of nitrogenous manure enabling the plant to assimilate more of other food, or to store it up more safely? or is it that there is less waste of tissue in the one case than in the other?

We think it abundantly evident, whatever may be the cause, that care must this season be taken in growing turnips with ammoniacal manures alone. We should prefer a small proportion of these manures, with a liberal allowance of carbonaceous manure, under the peculiar aspects of the crop; and an additional reason is afforded to spread the manure of the farm over as large a surface as possible, and make up the deficiency by a *small* addition of guano or dissolved bones.

We think it would not be amiss to give to the bulk of our soils a dressing of salt. It is certainly of use in checking, if not arresting altogether the progress of fingers-and-toes, and its antiseptic qualities are not unlikely to be serviceable, in the case of a tendency to decay this year.

THE NATURAL INDICATIONS OF FERTILITY AND BARRENNESS IN SOILS.

The papers on the natural indications of fertility and barrenness in soils, which have been published in the Journal of the Royal Agricultural Society, have opened rather than exhausted the subject. They prove that there is a field almost unbroken before those professional land-valuers who will undertake the task of reducing their art to something like system, and who have a sufficiently established reputation as practical men, not to be deterred from the attempt by fear of being branded as theoretical—the too common fate of all who venture to depart from the beaten track.

At the time those papers appeared, science in general, and chemical science in particular, were less in favour with the Society than at present. Some had gained *éclat* by teaching that the quality of the soil may be determined by ascertaining upon what geological formation it rests. This had produced a reaction, and had led others to contend that there are certain unknown indications, by which a ploughboy, walking across a field, can form a more correct notion of its productive powers, than are to be obtained from the best chemical or geological examination.

This secret was supposed to be possessed by many farmers, particularly with regard to land on which they had lived all their lives, and by all professional land-valuers. A premium was therefore offered by the Royal Agricultural Society, for the best essay on the natural indications of fertility or barrenness of soils. But few competitors, however, presented themselves for the prize, which was awarded to Mr. Bravender, a land surveyor of Cirencester, and a Fellow of the Geological Society. It contains much valuable matter, and may be considered as a fair exponent of the knowledge of soils

possessed by the most intelligent valuers of land, who are willing to make known the processes by which they arrive at their conclusions. Mr. Bravender commences his paper by expressing his surprise that a subject which he deemed of so much importance as to feel incapable of doing it justice should have received so little attention from agriculturists, and have been deemed unworthy of notice or study by cultivators of the soil. When first he applied himself to it, he found it beset with difficulties almost insurmountable. Surface appearances seemed to fall short of what he expected would be made useful to direct the judgment. He was disappointed at finding nothing of a more scientific and definite character. On further consideration, he felt that he had objected to that which he had not the power to remedy, and for which he was unable to find a substitute, except by a tedious course of experiment and observation, which it did not appear at that time practicable for him to undertake. Circumstances afterwards gave him opportunities of examining the principal geological strata of the island, and he had the advantage of inspecting whole districts, field by field, with the value of each in his hand, fixed by valuers of great experience and of the nicest judgment, and whose opinions, founded on those alone, had for many years been acknowledged to possess as much accuracy as the subject would admit of. The results of this extended observation and experience of himself and as to the characters of soils are embodied in the prize essay, under the heads of colour, consistency, vegetation, aspect and elevation above the sea, and geological situation.

Under the head of colour he lays it down as a rule that light shades, of brown, pale red, and whitish yellow, are generally indications of barrenness; a deep yellow, invariably so; and that dark-coloured soils are invariably fertile, with the exception of peaty and boggy soils, and black sand. It is added, however, that fertile lands are of various shades of colour, but all of them of a much darker hue than lands in the same district which are barren. The consistency or tenacity of the soil is treated as a very important indication of its quality, but, at the same time, as not easily definable. There are many degrees of consistency, the limits being a sand which does not cohere except when wet, and a clay which in the same condition forms a paste, and in a dry state hardens into clods resembling bricks. Between these two extremes fertility seems, he says, to oscillate, and can only be estimated between the lowest and the highest point by an assumption which is purely arbitrary, depending on the skill and judgment of the party forming the estimate. And then the question arises, what is barrenness, and what fertility? They are relative terms, and vary in common parlance with the ideas of those who use them. Some definite scale, however, must be adopted, and this is Mr. Bravender's: Pasture land which does not produce more than 1 ton of hay per acre when mown in its proper turn, and arable land which does not produce more than 20 bushels of wheat or 30 of oats to the acre, he calls *barren*. This leaves a wide range for *fertile* soils, which he considers to require, in practice, division into three classes at least, which he calls *fertile* producing without any extraordinay management 20 to 30 bushels of wheat to the acre, *more fertile* producing 30 to 40 bushels, and *most fertile* whose produce is 40 to 60 bushels.

As regards the degree of tenacity, indicating fertility or barrenness, Mr. Bravender lays down the following rules: Fertile soils crumble between the fingers, and are not reduced by pressure to a paste; they cannot be formed into pellets, and thrown from the end of a stick to a distance without breaking; when ploughed in a medium state of dryness, they form a furrow-slice with a clean shining surface, but broken by cracks at very short intervals; and in walking across the lands, we find the edges of the furrows crumble under the feet, the edges of the foot-prints being ragged and loose. Soils barren from excessive tenacity exhibit, on the contrary, none of these characters; but the furrow-slice cuts out as one entire piece without cracks: foot-prints impressed upon it are pressed down smooth, and are not ragged and loose at the edges: such soils may be worked into pellets, which do not break when thrown from a stick.

While these characters are described, however, as indicating barrenness or fertility, it is admitted that they are dependent on the weather and on cultivation. The land must, for this test, be between wet and dry; and on soils of a good texture and naturally fertile, temporary barrenness may be induced for one season or several. It may be induced for one season by the land being worked in a wet state into a paste, which hardens, in dry weather, into a crust. Sterility may be also caused for several seasons, by repeatedly cropping with corn without manure. This, which constitutes the worn land of Mr. Griffith's instructions to the Irish valuers, is called by Mr. Bravender accidental barrenness. Such lands, he says, appear to the superficial observer to be barren, when they are only apparently so. Unproductive, it is true, they are, but only for a time, until a judicious manager, with little more than his common farm resources, effects one rotation of a proper system of crops, when the soil becomes restored to its natural state, and ready to receive improvement from his future exertions.

It must be obvious, that to enable us to judge of

the intrinsic qualities of soils, some more certain criterion is required, not liable to be thus affected; and we think the surest method of attaining this, is to determine the proportions of clay and sand, which will give the degree of consistency indicated by the characters pointed out above, or by any other empirical characters which observation may suggest. Depth, which is an important element in fertility, in soils of the same composition, has been very slightly touched upon by Mr. Bravender.

VALUATION OF LAND IN IRELAND.

Our notice of the General Valuation of Ireland, as illustrative of the principles on which land is valued, will conclude with an account of the machinery by means of which that valuation is effected.

It is carried on under the Act of the 6th and 7th of William IV., was commenced in the year 1830, and has now, we believe, nearly reached its close. The commissioner whose name we have frequently mentioned, selects and appoints the valuers, who are required by the act to be surveyors who have previously been employed in valuing. The Lord Lieutenant has power to issue instructions to the commissioner. As an instance of these instructions, we find that up to 1844 the valuation had only extended to townlands or the smallest public divisions; but in that year the Lord Lieutenant directed that each separate holding, however small, should be valued.

The valuers are divided into two classes. The primary valuation is made by the *ordinary* valuers. In commencing a county, it is usually divided among a certain number of these, in proportion to its extent, giving a barony, or district—answering in some measure to a hundred in England—to each.

When the valuation of a barony is completed, the field-books and field-maps are sent to the commissioner's office, in Dublin; and subsequently, on the receipt of the field-books of an entire county, the second operation, or *check* valuation, commences. For this purpose the commissioner sends down a valuer, on whose judgment and experience he can rely, to re-value a certain portion—usually from one-fourth to one-sixth of each barony. This valuer uses the same maps, and values each townland according to the same lots or subdivisions as those used by the first valuers, but has no access to the field-books which contain their prices.

When the work is completed, the two valuations are placed opposite to each other, in a tabular form, for the purpose of comparison. When—but this rarely happens—considerable differences occur between the primary and the check valuation, a second check valuer is sent to revalue the townlands in which the differences exist. If the two check valuations agree, which is generally the case, the prices put upon the land are altered relatively to agree with the check valuations.

At this stage the deductions and additions are made for local circumstances, which have been described in a former article.

The whole of these allowances having been made for an entire barony or county, a schedule of the amount of the valuation is prepared. The next process is thus described by the commissioner:—"As only one-fourth or one-sixth of the whole is checked, fearing lest any error of importance should have escaped the observation of the valuer, I am in the habit of sending an intelligent person into the county under consideration, who is directed to show the schedule to the principal landed proprietors or agents of the district, and to ask whether, in their judgment, the relative value of the different townlands has been preserved. As in the course of this investigation many persons are consulted, several opinions will be given respecting the relative value of certain townlands; and if it appears that some of them are considered to have been unequally valued as compared with others, another valuer is sent to revalue those particular townlands, by which means I am enabled to judge whether any alteration should or should not be made in the valuation of the townlands in question."

Having gone through this ordeal, the schedules of value of each parish are printed and distributed as prescribed by the act; and special vestries are summoned to meet in each parish, to consider the propriety of appealing against any part of the valuation. Subsequently committees of appeal, appointed by the grand jury to hear and determine appeals in each barony, meet for that purpose. In consequence, however, of the pains taken to secure accuracy, such appeals, we are told, are rarely made; or, if made, are generally abandoned on explanation being made at the meeting of the committee of appeal.

This valuation, for purposes of local taxation, appears to be generally about 25 per cent. under the full or high rent value, but very near that of the best landlords—that is, the principal proprietors.

Thus in the county of Derry, which is chiefly owned by the London companies, it was found that the valuation schedule rarely differed so much as one shilling in the pound from their rentals; and

the same fact was observed with respect to lands of other large proprietors in that and other counties, while the full rents, under ordinary small landowners, were as much as thirty-three per cent. above the public valuation.

Under the poor-law, the assessment is required to be at the full value. The commissioner states, therefore, that acting on the knowledge of the above relations between the general valuation and the rent value, he has invariably replied to inquiries from the guardians of the poor-law unions in different parts of the country, respecting the addition which should be made to the amounts contained in the printed schedules, in order to bring it to a rent value, that this will be very nearly attained by the addition of one-third.

Such is the general valuation of Ireland. There is one fact connected with it, to which we particularly wish to direct attention, and that is that processes are given as well as results. The data on which the value is assigned to the land are entered in the field-books in detail, and can be produced before the committee of appeal. All, therefore, who are dissatisfied with the valuation, have it in their power to obtain a knowledge of the reasons on which it is founded. Is this the case with public or private valuations of land in England? What are the principles on which land is valued in this country? Is the art of valuing land as much in advance with us of its, present condition in Ireland, as English agriculture is in advance of Irish agriculture? These are questions which must be reserved for future inquiry. In the preceding account of the general valuation of Ireland, we have purposely confined ourselves to the valuation of land; but in the instructions issued by the commissioner, attempts equally elaborate have been made to reduce to system the valuation of houses and buildings, whether in the rural districts or in towns.

AGRICULTURAL BIOGRAPHY.

(Continued from page 496, vol. xxxviii.)

CCXXVII.—Martin, 1794.

Alexander Martin, farmer, of Salton, Mid-Lothian, wrote "General view of the agriculture of the county of Renfrew, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. The report occupies but 22 quarto pages; being a very small county, the view of it is corresponding.

CCXXVIII.—Ure, 1794.

Rev. David Ure, of Glasgow, wrote "General view of the agriculture of the county of Roxburgh, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. The report occupies 93 quarto pages, and deserves a repute. The author wrote "The survey of Dunbarton:" these reports are very well done.

CCXXIX.—Johnston, 1794.

Mr. Thomas Johnston, wrote "General view of the agriculture of the county of Selkirk, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. The report fills 50 quarto pages, and is well performed; and also "of Tweeddale," in 42 pages.

CCXXX.—Belches, 1794.

R. Belches, Esq. of Greenyards, in the county of Stirling, wrote "General view of the agriculture of that county, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" Edinburgh, 1794, 4to. The report occupies 64 octavo pages of a superior merit.

CCXXXI.—Billingsley, 1794.

John Billingsley, Esq. of Ashwick Grove, near Shepton Mallet, wrote "General view of the agriculture of the county of Somerset, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This report fills 192 quarto pages, with a neatly executed coloured map of the county. It has been justly reckoned a superior work of the kind.

CCXXXII.—Naismith, 1794.

Mr. John Naismith, at Hamilton, wrote "General view of the agriculture of the county of Clydesdale, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture, and internal Improvement;" London, 1794, 8vo. "Observations on the different breeds of sheep, and the state of sheep farming in the Southern districts of Scotland;" Edinburgh, 1795, 4to. "Elements of agriculture, being an essay towards establishing the cultivation of the soil, and promoting vegetation, on steady principles;" London, 1807, 8vo.

The last mentioned work is not contained in the National Library: it has been favourably mentioned. The county survey occupies 82 quarto pages, and has been much esteemed: no embellishments are given. The book on sheep conveys much information, collected during a tour through the parts mentioned, and made under the direction of the Society for the improvement of British Wool. The work fills 75 quarto pages of correct observations and very acute remarks.

CCXXXIII.—Heron, 1794.

Robert Heron wrote "General view of the natural circumstances of the Hebrides or Western Islands of Scotland; the names, means, and improvements; Edinburgh, 1794, 4to. This book has been thought worth being bound with other county reports. It occupies 99 quarto pages of very miscellaneous matter, agriculture being included.

CCXXXIV.—Erskine, 1794.

John Francis Erskine, Esq., of Mar, wrote "General view of the agriculture of the county of Clackmannan, and of the adjacent parts of Perth and Stirling; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. The report occupies 133 quarto pages, with a geological map of the county. This work had much repute, being the offspring of an educated mind and very large information and experience. The matters are well handled.

CCXXXV.—Johnston, 1794.

Bryce Johnston, D.D., wrote "General view of the agriculture of the county of Dumfries, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This report extends to 114 quarto pages, and a long appendix containing forms of leases, and several valuable letters. The work was reckoned among the best of the surveys; the author was a minister at Holywood.

CCXXXVI.—Beatson, 1794.

Robert Beatson, of Pitteadie, wrote "General view of the agriculture of the county of Fife, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" Edinburgh, 1794, 4to. The report fills 38 quarto pages, with many useful observations on general agriculture; the lease of land is well discussed.

CCXXXVII.—Webster, 1794.

James Webster, farmer at Fowlis Easter, county of Perth, wrote "General view of the agriculture of Galloway, in the county of Wigton and Stewartry of Kirkcudbright, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. The report occupies 42 quarto pages, and contains less valuable matter than might be expected from a district of country which contains good soils, a rich proprietary, and a breed of cattle that is one of the most symmetrical of the many varieties of British cattle.

CCXXXVIII.—Maunsell, 1794.

William Maunsell, LL.D., wrote "Letter on the culture of potatoes from the shoots;" London, 1794, 8vo. The National Library does not contain this work; the above statement appears in the Bibliotheca Britannica and in Loudon's list of authors.

CCXXXIX.—Quayle, 1794.

Thomas Quayle, Esq., wrote "General view of the agriculture of the Isle of Man, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This quotation is from the Bibliotheca Britannica; the book in the National Library is of 1812, a thin octavo of 193 pages. The work shows much practical knowledge of a correct description.

CCXL.—Pringle, 1794.

Andrew Pringle wrote "General view of the agriculture of the county of Westmoreland, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This report fills 55 quarto pages, and is a very respectable performance.

CCXLI.—Macphail, 1795.

James Macphail, 20 years gardener to the Earl of Liverpool, wrote several esteemed works on gardening, and in 1795 published "Hints and observations on the improvement of agriculture;" London, 1795, 8vo. The work is not found in the National Library, which contains two books by the author, on gardening.

CCXLII.—Cochrane, 1795.

Archibald Cochrane, Earl of Dundonald, was born in 1749. In his younger years, he served in the army and navy, and on succeeding to the earldom on the death of his father, he retired to scientific pursuits, chiefly relating to manufactures and commerce. In the prosecution of these objects he engaged in a variety of schemes, some of which were very beneficial to the public. His active mind

beheld the relation betwixt chemistry and agriculture, and he wrote "A treatise showing the intimate connection between agriculture and chemistry;" London, 4to. "The principles of chemistry applied to the improvement of the practice of agriculture:" 1799, 4to. The first work is addressed to the cultivators of the soil, to the proprietors of fens and mosses in Great Britain and Ireland, and to the proprietors of West India estates. The National Library does not contain these works; a matter of regret, as the author was the first scientific person who directed attention to chemical agriculture. It has not yet progressed much beyond the first conception; but may ultimately work much benefit, though it may be justly doubted if nature has placed any matters in mosses and bogs, that can be extracted, or that are worth the labour of procurement.

The author died in 1831, and was succeeded in the title by his son, the celebrated Lord Cochrane.

CCXLIII.—Ward, 1795.

James Ward wrote "Representations of cattle, sheep, pigs, horses, at present in this Island; with descriptions characteristic of each genus, their use, merits, and defects;" London, 4to. Except in an advertisement, this work is not noticed in any place.

CCXLIV.—Anstruther, 1796.

Sir John Anstruther, Bart., wrote "Remarks on the drill husbandry, by which the superior advantages of that mode of cultivation are pointed out, and its profits ascertained from actual experiments; also a comparison of it with the most approved modes of broadcast husbandry;" London, 1796, 8vo., price 4s. This work in the National Library contains 230 pages of MS. written in a clear and very legible hand, with drawings of implements and hoed rows of plants. The twelve chapters discuss the merits of drill husbandry, its practice, the results, expenses, and profits. The book is subscribed by "John Anstruther," who must have possessed a very ample and correct practical knowledge of agriculture. No other mention has been made of the author. The name denotes a Scotch descent in the county of Fife.

CCXLV.—Kirkpatrick, 1796.

H. Kirkpatrick wrote "An account of the manner in which potatoes are cultivated and preserved, and the uses to which they are applied in the counties of Lancaster and Chester;" London, 1796, 8vo., price 1s. The work fills 46 octavo pages, describing the early and late kinds of potatoes, the various modes of culture, and use of the esculents. The author published works on divinity, and may have been a clergyman.

CCXLVI.—Hodskinson, 1796.

Joseph Hodskinson of Arundel-street, London, wrote "Plain and useful instructions to farmers; or an improved method of managing arable lands, with some hints on the drainage, fences, and improvements of roads;" addressed to country gentlemen and farmers in general. London, 1796, 8vo. This work occupies 38 pages of general directions on various points of occurrence.

CCXLVII.—Cullyer.

John Cullyer, of Wicklewood, Norfolk, wrote "The gentleman and farmer's assistant, containing tables for measuring superficial areas of lands and other plain surfaces." The figures of land are of the most simple kind, and the dimensions are taken in yards. The work occupies 123 duodecimo pages, and is usefully compiled: it passed into two editions.

CCXLVIII.—Wright, 1795.

Sir James Wright, Bart., wrote "Observations upon the important object of preserving wheat and other grain from vermin, with a safe and efficacious method of preventing the great depredations that are made on these valuable articles, &c.;" London, 1796, 4to., price 4s. This work forms a thin quarto of 68 pages, and is dedicated to the King from Rayhouse, Essex. The author recommends, by means of many favourable calculations, the use of pendant slate frames to cover ricks of hay and grains, and gives the profit that arises from the use. The subject passes into forests, common fields, and wastes, from which last the amount of an acre is given from each county. The book must never have attracted much notice.

CCXLIX.—Dillon, 1796.

John Talbot Dillon, Esq., M.R.I.A., Knight and Baron, &c., of the Sacred Roman Empire, was under-secretary of the Board of Agriculture, and wrote "An essay on the comparative advantages of oxen for tillage in competition with horses;" London, 1796, 8vo., price 2s. This author wrote largely, and had travelled much, chiefly in Spain. He got the groundwork of the above essay from communications in French, and from the results in farming of Chevalier de Monroy, and added his own ideas and observations. He labours hard, as all others on the same subject, to establish a fallacy and a contradiction to the ordinations of nature. The book needs no comment; it occupies 67 octavo pages, and is bound along with other essays into a volume.

CCL.—Kirwan, 1796.

Richard Kirwan, LL.D., F.R.S. L. and E., Principal of the Royal Irish Academy, was an

eminent philosopher and various author; died in 1812. He published works on chemistry, mineralogy, geology, temperature, and general meteorology; logic and metaphysics were included and well discussed. He wrote "On the manures most advantageously applicable to various sorts of soils, and the causes of their beneficial influence in each particular instance;" London, 1796, 8vo., price 2s. —1809, 8vo., price 2s. The work occupies 96 octavo pages, of short but very correct statements. Little or nothing new is put forth, but known facts are scientifically explained, and suggestions offered.

Mr. Kirwan's mind was refined to a philosophic nicety, and too delicate for the practices of the gross art of cultivating the earth. He neglects practical experience, as he had none, and descants largely on the chemical relations of the art, and in a minuteness that was well observed by Arthur Young to be wholly useless in agriculture, however desirable in all matters that are purely scientific.

CCLI.—Proctor, 1796.

W. Proctor wrote "Complete agricultural dictionary;" one large volume, 8vo. No notice of this statement anywhere appears, but in a bookseller's advertisement of 1810.

CCLII.—Turbilly, 1796.

— Turbilly wrote "On the cultivation of waste and barren lands;" 8vo., price 3s. This work has been advertised, but it is not seen in any catalogue of books, or list of authors.

CCLIII.—Morley, 1797.

Christopher Morley wrote "Practical observations on agriculture, drainings, &c., addressed in two letters to Sir John Sinclair;" London, 1797, 4to., price 1s. 6d. This book does not appear in the National Library; the above statement is taken from the Bibliotheca Britannica, and Loudon's list of authors. Our notice rests on these authorities.

CCLIV.—Johnstone, 1797.

John Johnstone was a land surveyor and drainer at Edinburgh. He wrote "An account of the most approved mode of draining land, according to the system practised by the late Mr. Elkington; with an appendix, containing hints for the improvement of bogs and other marshy grounds after draining, together with observations on hollow and surface draining in general—the whole illustrated by explanatory engravings, drawn up for the consideration of the Board of Agriculture;" London, 1797, 4to., price 21s., subsequent editions in 8vo. Mr. Johnstone executed his task most creditably, but the fallacious principle has long since vanished and claims no notice now. It is surprising that it was ever entertained at all.

CCLV.—Laurence, 1797.

John Laurence, a veterinary surgeon, published several professional works, and wrote "The modern Land-steward," "The farmer's pocket calendar," and "The new farmer's calendar." In the Modern Land-steward, the duties and functions of stewardship are considered and explained, with their several relations to the interests of the landlord, tenant, and the public. These works did not appear till ten years after the date now used, which marks the first appearance of the author in print.

The general treatise by this author, on animals, the ox, sheep, and swine, is an octavo volume of 639 pages, which contain a mass of varied information of the most useful kind. The book is dated in 1808, and was very favourably received; it is dedicated to Lord Somerville.

The Modern Land-steward is an octavo volume of 415 pages of very desultory matter, sensible enough, but most mixedly arranged. The author had a great facility of writing, and his language flowed most promiscuously. But everywhere, in the mass, there are displayed acute perception, shrewd ideas, and very enlightened views of the pertinent subjects which are treated.

The New Farmer's Calendar fills 554 octavo pages, and treats the business of each month of the year, and also every detail of practical farming. Like the former work, the matter is large and valuable, but much jumbled and mixed. The plan of a farmyard is given—elliptical, and each building forming a straight part of the general curvature. It is fanciful rather than useful, but shows an inventive talent in that way. The author possessed much varied knowledge, and a very lively imagination. Like other enthusiasts, he carried much too far his hobby of row culture, which has its limits along with other applications.

CCLVI.—Douglas, 1798.

Robert Douglas, D.D., was minister of Galashiels, in south of Scotland, and wrote "General view of the agriculture of the counties of Roxburgh and Selkirk, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" Edinburgh, 1798, 8vo.; London, 1802, 8vo. Maps of each county accompany these reports, which form an octavo volume of 378 pages, which has always been reckoned the best of the Scotch reports. Figures of a plough, gate, and harrows are on the last page of the work.

CCLVII.—Dix, 1798.

William Spicer Dix, of Exeter, Devon, wrote

"Remarks on the utility of a newly invented patent machine for clearing grain from the straw, instead of threshing it by the flail;" London, 1798, 4to., price 1s. This work occupies 15 quarto pages, with a drawing of the machine, which cleared corn from the ears by friction, without injuring the straw or the grain. One man did the work of ten by the flail, and more grain was procured. The work was done in the field, without ricking and thatching the grain. Similar plans have been devised, but none have succeeded, by reason of the straw and grain being inconveniently parted in too large a mass for preservation.

CCLVIII.—Fox, 1798.

William Fox, attorney at law, wrote "Remarks on various reports transmitted to the Board of Agriculture in the year 1794;" London, 1798, 4to. This work occupies 76 quarto pages of extracted remarks from several county reports. The author had selected well, and observed very acutely.

CCLIX.—Lawson, 1798.

Stephen Lawson, of London, wrote "Essay on the use of mixed and compressed cattle fodder, for feeding and fattening horses, oxen, cows, sheep, hogs, and pigs, adapted for young stock, and for horses and cattle on shipboard, in camps, or in garrisons, with useful tables, &c.; London, 1798, 8vo., 2s. 6d.

The work fills 88 octavo pages, in which the author laboured and failed to establish the superiority of mixed and compressed fodder over the single articles masticated by the animals. Such attempts may never suceeed, being opposed to an ordination of nature.

CCLX.—Smith, 1798.

John Smith, D.D., minister at Campbellton, wrote "General view of the agriculture of the county of Argyll, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" Edinburgh, 1798, 8vo. This work fills 232 octavo pages, and has always been esteemed.

CCLXI.—Middleton, 1798.

John Middleton, Esq., land surveyor, London, of West Barns farm, Merton, and of Lambeth, Surrey, wrote "General view of the agriculture of the county of Middlesex, with observations on the means of its improvement, and several essays on agriculture in general; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1798, 8vo. This work constitutes an octavo volume of 597 pages, accompanied with a map of the county, coloured and neatly executed. General opinion has ever allowed this report to be the best of all the surveys of English counties, in quantity of matter, arrangement, and practical knowledge. The author wrote a very reputable essay in Nicholson's Journal: "Observations on the various kinds of manure;" and his name has always been favourably mentioned.

CCLXII.—Tatham, 1798.

William Tatham published several works on inland navigation and commercial subjects, and on courses of rivers. He wrote "National irrigation; or, the various methods of watering meadows, affording means to increase the population, wealth, and revenue of the kingdom, by an agricultural, commercial, and general economy in the use of water;" 1798, 8vo., price 8s. "Auxiliary remarks on an essay on the comparative advantages of oxen for tillage in competition with horses;" London, 1801, 8vo., price 1s. 6d. The last work is not found in the National Library; the first is an octavo volume of 427 pages, with drawings of the common forms of irrigation. The author advocates very justly and forcibly the use of water in all possible cases of application.

CCLXIII.—Priest, 1798.

The Rev. St. John Priest wrote "General view of the agriculture of Buckinghamshire, drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1798, 8vo., price 12s. The author was secretary to the Norfolk Agricultural Society, and compiled a very excellent report of 412 octavo pages, with a tabular appendix of the parishes of the county, extent, and value. The price of labour is given, poor rates, profits per acre, and the seed sown and produce of crops. This report is at the head of the useful list.

CCLXIV.—Lowe, 1798.

Robert Lowe, Esq., of Oxton, wrote "General view of the agriculture of the county of Nottingham, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1798, 8vo., price 4s. This work contains 192 octavo pages, and possesses a geological map of the county. The last part of the book is filled with matter hardly relevant, or belonging to agricultural information.

CCLXV.—Fenwick, 1798.

John Ralph Fenwick, M.D., wrote two essays: I. "Reflections on calcareous manures." II. "On

elastic fluids in vegetation." The bulk is 26 octavo pages, being a part of the transactions of the Literary and Philosophical Society of Newcastle-upon-Tyne. The author trod the old path, and did not find a new road to any point.

CCLXVI.—Banister, 1799.

John Banister, Gent., of Horton Kirby, in Kent, wrote "A synopsis of Husbandry, being cursory observations on the several branches of rural economy, adduced from long and practical experience on a farm of considerable extent;" London, 1799, 8vo., price 7s. This book is not found in the libraries of the British Museum, and the above statement rests on the authority of the Bibliotheca Britannica and Loudon's list of authors.

CCLXVII.—Somerville, 1799.

Right Hon. John Lord Somerville wrote "Address to the Board of Agriculture on the subject of sheep and wool;" London, 1799, 8vo. "The system followed by the Board of Agriculture, with dissertations on the growth and produce of sheep and wool, as well Spanish as English; observations on the poor and poor-laws;" London, 1800, 4to., price 15s. "Facts and observations relative to sheep, wool, ploughs, and oxen, in which the importance of improving the short-woolled breeds by a mixture of the Merino breeds is deduced from actual practice; together with some remarks which have been derived from the use of salt;" London, 1803, 8vo., price 4s. New edition, 1809, 8s. "A treatise on hemp, including a comprehensive account of the best modes of cultivation and preparation as practised in Europe, Asia, and America; with observations on the sun plant of India, which may be introduced as a substitute for many of the purposes to which hemp is exclusively applied;" London, 1810, 4to., price 31s. 6d.

The Book of Facts and Observations is an octavo of 180 pages, in which useful matter is mixed with much irrelevancy. The author laboured in the cause of the double-furrow plough and of oxen being superior to horses for farmwork; two fallacies which might have struck the most obtuse observer. The first is a slow unwieldy operation, and requires much power; and in such work as ploughing, the frequency of the process surmounts the heavy movement; and in the case of oxen and horses, nature has decided the controversy in the muscular formation of the animals.

The System followed by the Board of Agriculture is an octavo book of 300 pages, relating to the facts and usages which the Society had collected and promulgated.

The Dissertations on Sheep and Wool is a quarto volume of 187 pages of the most useful matter which the author compiled. The book on hemp is not found in the National Library

The crotchets of the time Lord Somerville lived in—double furrow ploughs, oxen over horses, and Merino sheep—completely failed, and the reason of the two first failures have been mentioned. The Merino sheep could not be fattened in England, and as mutton is more valuable than the wool, that deficiency settled all further dispute. "Farewell reason, farewell discretion," says Sterne, "when a man has mounted the hobby of his fancy," and "circumstances govern everything in this world, for no man can govern them." From the inadvertence of controlling causes, and allowing a preconceived opinion to bar the entrance to every occurring consideration, are to be attributed the many blunders of theory, and the consequent neglect and disrepute.

Lord Somerville died in 1815 in Switzerland, on his way to Italy; was buried there, and afterwards disinterred and brought to England.

CCLXVIII.—Parkinson, 1799.

Richard Parkinson, of Doncaster, wrote "The experienced farmer, an entire new work, in which the whole system of agriculture, husbandry, and breeding of cattle, is explained, and copiously enlarged upon, and the best methods with the most recent improvements pointed out;" London, 1799, 2 vols., 8vo., price 21s. "A tour in America in 1798, 1799, and 1800; exhibiting sketches of society and manners, and a particular account of the American system of agriculture, with its recent improvement;" London, 1805, 2 vols., 8vo., price 15s. "The English practice of farming, exemplified in the management of a farm in Ireland—with an appendix; containing, first, a comparative estimate of the Irish and English mode of culture as to profit and use; and secondly, a regular rotation of crops for a period of six years;" London, 1806, 8vo., 9s. "Treatise on the breeding and management of live stock, comprising cattle, sheep, horses, asses, and pigs. To which are added—directions for making butter and cheese, curing hams, pickling pork and tongues, preserving eggs, &c.;" London, 1809, 2 vols., 8vo., price 24s. "Practical observations on gypsum as a manure;" London, 12mo., 1808. "General view of the agriculture of the county of Huntingdon, drawn up for the Board of Agriculture;" London, 1811, 8vo., 9s.

The Bibliotheca Britannica quotes the last mentioned work and omits the preceding one; Loudon's list of authors mentions the survey of Huntingdon and omits the essay on Gypsum, which is found in the National Library, and the Survey is not found. The essay fills 121 pages of duodecimo

size, and mentions at much length the qualities of gypsum, and the modes of its use. The results are large, as with all newly introduced articles of the kind. But the author is very guarded, and makes no very extravagant asseverations on the subject.

The English Practice of Agriculture exemplified in Ireland, is a volume of 338 octavo pages of the most useful matter that had yet appeared in the agricultural world. The statements evince the most correct practical knowledge, and in the easiest mode of intelligence. It appears that the author had farmed in Ireland, and was the actor of the operations on which the comparisons are made.

The Tour in America forms an octavo volume of 735 pages, which give a very interesting account of America, its soil and productions, population, and state of society.

The treatise on Live Stock is in two octavo volumes of 436 and 484 pages, describing the animals of the farm, the breeding and general management. The portraits of the animals are not very neat, but are true enough in the likeness, and the observations are most correct. The subject has never been better handled, nor more practically illustrated.

The Experienced Farmer is not found in the National Library, though it is always mentioned as the first of the author's works. But it may not have been the best on that account.

Parkinson has always been reckoned one of the best practical writers on agriculture to the time in which he lived, and our opinion thinks very justly. If the description of grain farming, which has not been found, corresponds with the volume on live stock, the palm of merit must be given to the author, without any hesitation, of the most enlightened practice that had been printed for the public use. In this view, the universal opinion coincides.

CCLXIX.—Darwin, 1800.

Erasmus Darwin, M.D., F.R.S., was born in 1731, at Elton, near Newark, in the county of Nottingham. He was educated for the medical profession at St. John's College, Cambridge, and at Edinburgh; and having taken the degree of doctor in medicine, he went to Lichfield, and there commenced his career of practice. He had much success, married twice, and had a large family, removed to Derby in 1781, and died in 1802, in the seventieth year of his age.

Our author was an early votary to poetry, but sent nothing into the world till 1781, when there appeared the "Botanic Garden," in which he celebrates the loves of the plants. In 1793, the author published "Zoonomia," or the laws of organic life, the second volume in 1796. In 1801, there appeared the "Phytologia," or the philosophy of agriculture and gardening; and soon after, a small tractate on female education.

Our purpose comprehends only one work of Darwin, the Phytologia, which is a quarto volume of 612 pages, in 3 parts—physiology of vegetation, economy of vegetation, agriculture and horticulture, with an appendix on the improved construction of the drill plough. The section on manures, or the food of plants, is the sole part that interests the agriculturist, and it is much too refined for the grossness of the farmer's application of the articles. No new fact was elicited and established, but much light was cast on the processes that had been adopted.

Darwin was a poetical philosopher of a high, if not of the highest, degree; he had a rich imagination, a most exuberant fancy, and reasoned from analogy till every string of connection was lost, and his creations stood alone, in an ideal world, without support, and without any approach to comprehension. Very many of his sophisms have ever passed for reveries; but future opinions have acceded pretty closely to some of his propositions, and have sanctioned the vagaries which in his own day appeared to be the most eccentric. The Zoonomia is wholly a medical production.

CCLXX.—Thomson, 1800.

Rev. John Thomson, D.D., minister of Markinch, wrote "General view of the agriculture of the county of Fife, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1800, 8vo. The work forms a volume of 423 octavo pages, with a map of the county, and several portraits of buildings and implements; an appendix contains the form of a lease of land, and a notice of an inland canal. The matter of the report is well arranged and very suitably described, the suggestions are moderate and quite tangible. The work always enjoyed a very deserved reputation.

CCLXXI.—Dalrymple, 1800.

William Dalrymple, Esq., wrote "A treatise on the culture of wheat;" London, 1800, 8vo, price 2s. The work occupies 68 pages, and treats of wheat on strong and light lands, the rotations of cropping, seed and sowing, and steeps or brines. The author seems to have been a practical farmer, and dated the preface of the book from Chessington. The ideas are not very enlightened, and are now far superseded.

CCLXXII.—Stacey, 1800.

Rev. Henry Peter Stacey, LL.D., F.L.S., wrote

"Observations on the failure of the turnip crop, with proposals for a remedy, not altogether new, yet not fully considered by agricultural writers;" London, 1800, 8vo., price 1s. This statement appears in the Bibliotheca Britannica, and in Loudon's list of authors, but the book is not found in the libraries of the British Museum.

CCLXXIII.—Parry, 1800.

Caleb Hillier Parry, M.D., F.R.S., physician, Bath, wrote "Facts and observations, tending to show the practicability and advantage to the individual and the nation of producing in the British Isles clothing wool equal to that of Spain; together with some hints towards the management of fine-woolled sheep;" London, 1800, 8vo., price 4s. The work occupies 93 quarto pages of good reasoning on a favourite subject, which left wholly out of view the surrounding circumstances of the occupation. The author cultivated his own estate of land, and was a very plausible theorist.

CCLXXIV.—Tennant, 1800.

Smithson Tennant, Esq., F.R.S., &c., wrote "On the different sorts of lime used in agriculture;" Nich. Journal, iii, 440, 1800. The author was an amateur chemist of note, but the essay on limes was left in obscurity. It added nothing to the existing entertainments on the subject of these valuable bodies, which are yet but imperfectly known.

CCLXXV.—A Practical Farmer, 1801.

This name wrote "A treatise on the culture of potatoes, showing the best means of obtaining productive crops, a matter of national importance:" Launceston, 1801, 12mo., stitched. This essay contains 48 pages of duodecimo size, with the contents in 16 chapters—on the culture of potatoes; of seed; of the roots saved for seed; of an early crop; to have an early productive crop; of manure; of preparing the land if before in grass; of planting potatoes; for a late crop; of preserving a general crop during winter; for culinary or kitchen use; uses for small potatoes; horses; bullocks; pigs; to get pork at a cheap rate. The cultivation is done on the lazy bed system, and seems more adapted for cottier farmers than the extensive cultivator of land. In the most improved and scientific rotations of crops, potatoes do not follow grass, nor is the use of potatoes unknown in rearing cattle and pigs. But the author's opinion may be doubted, "that the gravy of beef fattened with potatoes, is richer than from any other substance." The nutritious quality of the potato does not uphold the superiority over other matters in rearing and fattening the animal frame.

CCLXXVI.—Hoyte, 1801.

Henry Hoyte, land surveyor, wrote "An essay on the conversion of soils, with observations and remarks on the breeding of sheep and other cattle;" London, 1801, 4to., price 2s. 6d. This statement is made by the Bibliotheca Britannica: the National Library does not contain the book.

CCLXXVII.—Heslop, 1801.

Rev. Luke Heslop, D.D., archdeacon of Bucks, and rector of Bothal, Northumberland, wrote "A comparative statement of food produced from arable and grass, and the returns arising from costs, &c.;" London, 1801, 4to., price 2s. The National Library does not contain this work; another essay is found on the "Duty of property," in which the author considers property and professions in being duly assessed.

CCLXXVIII.—A Farmer, 1802.

"Rural recreations" were written by "a farmer," being "the modern farmer's calendar and monthly instructor" illustrated with copper-plates; London, 8vo., 1802. The preface of this is signed by A.C.H., and dated at London, 20th March, 1802. The contents are in 128 octavo pages, and give instructions of the necessary work in every month of the year. The frontispiece is the design of a farmery in the shape of a cornered circle, of which the dwelling house forms the front; the other buildings join in the corners, and enclose the single yard, which serves all the purposes of manufacturing manure. The author's ideas on the plan of farm buildings are far behind the age in which he lived. The bed-rooms on the ground floor of a farmer's dwelling are a posterior entertainment to the year 1802. The items of cultivation are sensibly discussed and recommended, but nothing new is elicited or attempted to be issued.

CCLXXIX.—Bell, 1802.

Benjamin Bell, F.R.S.E., surgeon, Edinburgh, wrote "Essays on agriculture, with a plan for the speedy and general improvement of land in Great Britain:" Edinburgh, 1802, 8vo., price 9s. These essays are political, rather than practical, and propose to advance agriculture by giving bounties for growing potatoes and grains; rearing horses, cattle, sheep, and managing dairies; the use of manures of all kinds; cottages and gardens; plantations, and the generally best-managed farms. The sum expended to be about half-a-million yearly. The author writes very justly on the farmers having the means in their hands, and on diffusion of agricultural knowledge.

CCLXXX.—Bartley, 1802.

Nehemiah Bartley, Esq., secretary to the Bath

Agricultural Society, wrote "Observations on the conversion of pasture land into tillage, and on using potatoes in manufacturing starch and feeding sheep;" London, 1802, 8vo., price 1s. 6d. This statement appears in the Bibliotheca Britannica, and in Loudon's list of authors; but the book is not found in the National Library. Our research found another work of the author, which had escaped the two bibliographies now mentioned, being "A series of letters on fine clothing wool from Spanish rams and English ewes; with cursory remarks on the superiority of the smaller breeds of animals, the culture of the potato, and of the mangel wurzel plant, as winter and spring food for cattle, &c.;" London, 1802, 8vo., price 2s. The letters occupy 84 octavo pages, addressed by various persons to the Bath Society on the then engrossing topic of the Merino sheep. The last page contains an advertisement of the work that was first mentioned, "On the conversion of pasture land into tillage."

CCLXXXI.—Findlater, 1802.

The Reverend Mr. Charles Findlater, minister of the parish of Newlands, in the county of Peebles, wrote "General view of the agriculture of the county of Peebles, with various suggestions as to the means both of the local and general improvement of agriculture;" Edinburgh, 1802, 8vo., price 7s. This work occupies 413 octavo pages, and is accompanied with a map of the county. The subject matter is well arranged and very judiciously related. The notes and appendix are very valuable on the social policy of the district and its regulations: the report has always been esteemed.

CCLXXXII.—Alderson, 1802.

John Alderson, M.D., physician at Hull, wrote "On the improvement of poor soils, read in the Holderness Agricultural Society in answer to the following question: What is the best method of cultivating and improving poor soils, where lime and manure cannot be had? with an appendix and notes;" London, 1802, 8vo., price 2s.; second edition in 1807. The essay occupies 34 octavo pages, and places the necessary improvements to consist in mixing the various earths that are known to constitute fertility. The reasoning offers nothing new, and but slightly valuable.

CCLXXXIII.—Tighe, 1802.

William Tighe, Esq., M.P., wrote "Statistical summary of the county of Kilkenny, made in the years 1800 and 1801;" London, 1802, 8vo. A geological map of the county embellishes the work, which is a thick volume of 700 pages. The contents are very varied, agricultural, commercial, and mineralogical, with many tables and acts of improvement. The reports are numerous, and meetings of committees endless.

CCLXXXIII—Garrand, 1802.

George Garrand wrote "A description of the different varieties of oxen in the British isles, with engravings on an exact scale from nature;" folio, price £5 5s., or coloured £10 10s. No notice of this book or author has appeared, except in a bookseller's advertisement.

CCCLXXXV.—Wimpey, 1802.

R. Wimpey wrote "Rural improvements, or essays on the most rational methods of improving estates;" London, 8vo., price 7s. An advertisement only has made known this book and the author's name.

CCLXXXVI.—Munnings, 1803.

Rev. Thomas Crowe Munnings wrote "An account of some experiments for drilling and protecting turnips, in the years 1800, 1801, and 1802, together with some miscellaneous observations on agricultural subjects;" London, 1803, 8vo., price 2s. 6d. The work occupies 84 octavo pages, and preserves turnips during winter, by removing each alternate drill of roots, and covering with the earth of a plough furrow the remaining rows. The process might have been told in one page.

CCLXXXVII.—Knapp, 1803.

J. L. Knapp, Esq., F.L.S. and A.S., wrote "Gramina Britannica, or representations of the British grasses, with remarks and occasional descriptions;" London, 1804, 4to. The work is a quarto volume of 119 plates of grasses, the portraits of which are puny and badly executed both in the engraving and colouring. A page is printed opposite to each plant, containing the scientific description, with some practical remarks. The price of the book was £8 8s.

CCLXXXVIII.—Plymley, 1803.

Joseph Plymley, M.A., Archdeacon of Salop, wrote "General view of the agriculture of the county of Shropshire, with observations drawn up for the consideration of the Board of Agriculture and internal improvement;" London, 1803, 8vo., price 7s. 6d. The work contains 366 octavo pages, with a map of the county, and some drawings of canal gates and locks. The book is a very creditable production.

CCLXXXIX.—Bowden, 1803.

Thomas Bowden wrote "The farmer's director, or compendium of English husbandry;" London, 8vo., price 2s. An advertisement has only been

seen of this work; no list of books or authors contains the name.

CCXC.—Forsyth, 1804.

Robert Forsyth, Esq., Advocate, Edinburgh, author of "Elements of moral science," and other esteemed philosophical works, wrote "Principles and practice of agriculture systematically explained;" Edin., 1804, 2 vols., 8vo., price 21s. "Beauties of Scotland, containing a clear and full account of the agriculture, commerce, mines, and manufactures, of the population, cities, towns, and villages, &c., of each county, embellished with engravings;" Edin., 1809, 5 vols., 8vo., price 75s. This last work is found in the National Library, but the first is wanting; it was compiled from the fourth edition of the Encyclopædia Britannica, to which work the author had contributed. Agriculture occupies 250 pages of the first volume, and is embellished with many portraits of implements, of irrigation, and draining. The writing displays throughout much sound sense and a sober discretion, as in every work that was done by the author.

CCXCI.—Gray, 1804.

Andrew Grey, machinist, wrote "The experienced mill-wright, or a treatise on the construction of some of the most useful machines; to which is prefixed a short account of the general principles of mechanics, and of the mechanical powers, with the latest improvments;" Edin., 1804, 4to., price 35s. "Plough-wrights' assistant, or practical treatise on various implements employed in agriculture, illustrated with 16 engravings;" Edin., 1808, 8vo. "A treatise on spinning machinery;" Edin., 1809, 8vo., price 10s. 6d. The National Library contains only the "Plough-wright's assistant," which is an octavo volume of 220 pages, with many portraits of ploughs, harrows, cultivators, thrashing and drill machines. The author much excelled in the construction of ploughs of the swing kind, to be drawn by two horses; the mouldboard which he devised has not yet been surpassed by the very many subsequent modifications, and it yet forms the most preferable construction for the varied purposes of the turnip cultivation.

CCXCII.—Greaves, 1804.

William Greaves, agriculturist, of Sheffield, wrote "Treatise on natural and practical agriculture;" London, 1804, 8vo., price 12s. The work occupies 680 octavo pages, and treats on drilling crops, grass, turnips, fallow, ridging, smut, mildew, trees, and seeds. The author is most virulent against paring and burning, which he absolutely interdicts as a national curse. Many remarks are sensible and correct, but added nothing to the already existing practice.

CCXCIII.—Dickson, 1804.

R. W. Dickson, M.D., of Hindon, Middlesex, wrote "Practical agriculture, or a complete system of modern husbandry; with the methods of planting and the management of live stock, plates;" London, 1804, 2 vols., 4to., price 84s. "The farmer's companion, being a complete system of modern husbandry;" London, 1811, 8vo., price 42s. A monthly agricultural journal was edited by the author from July, 1807, to December 1808, and was then discontinued. The work on live stock has always been much reputed for sound and correct information. Dr. Dickson died in London in 1824. Loudon's list of authors gives another work, "An improved system of cattle management;" London, 1822, 2 vols., 4to. This work was drawn from the preceding one, that was quoted, and embodies the substance separately with additions.

CCXCIV.—Saunders, 1804.

J. Saunders wrote "Experimental essay on swine, containing hints on the best kinds, their habits; and on hay tea as an economical food for them;" 8vo., price 10s. 6d. Also "Essays on particular branches of agriculture and husbandry, pointing out several important improvements;" 8vo., price 10s. 6d. This statement has been advertised; the Bibliotheca Britannica quotes the work on swine, while the National Library contains neither the works nor the author's name.

CCXCV.—Loudon, 1806.

John Claudius Loudon was born in 1783, at Cambuslang, in Lanarkshire, in the west of Scotland. He was maternal cousin to Dr. Claudius Buchanan, whose labours in India are well known. Mr. Loudon was the eldest of a large family, whose father was a very respectable farmer at Kerse Hill, near Gogar, about five miles from Edinburgh. Our author very early showed an inclination for the natural sciences, and after receiving a fairly liberal education in Edinburgh, he resided with Mr. Dickson, a nurseryman and landscape designer in Leith Walk. He was a zealous student, and made much proficiency in various attempts of study.

In 1803, Mr. Loudon first arrived in London, and lost no time in making the suitable circle of acquaintance, and in beginning the profession of landscape gardener. He noticed and published upon laying out the public squares of London, and being introduced to Sir Joseph Banks, he became a member of the Linnean Society and met many scientific men, whose conversation much whetted the natural activity of his mind. The Earl of Mansfield employed him to alter and arrange the Palace Gardens at Scone, where the ideas occurred

to him of the first work he wrote, which will be afterwards mentioned as the first in the order of publication. At this time, the author was similarly employed by other proprietors. In 1805, he returned to London and pursued his professional labours: he removed into the country for the benefit of his health, and taking an interest in farming, his representations induced the removal of his father to Woodhall, near Harrow. A pamphlet from him on the improved rental of land procured a farm of 1,500 acres near Oxford, on which he established a sort of agricultural college. He did not reside long there, and finding himself worth £15,000 from his labours he resolved to visit foreign countries. In 1813, he went by Gottenburg, Memel, Konigsburg, Elbing, to Dantzic and hence to Berlin and Warsaw. Hence he visited St. Petersburgh and proceeded to Moscow, and found it in ruins from the general burning of 1812. Being in the rear of the French army, he was often suspected as a spy and occasionally bandied about. He proceeded by Cracow to Vienna, Prague, Dresden, and Leipsic, by Madgeburg to Hamburgh, whence the sea carried him to England.

During this long and interesting journey, Mr. Loudon collected a mass of valuable information on gardens, palaces, and rural residences. He visited many scientific men, and was elected member of several learned bodies. It is curious that he did not publish his travels.

An unfortunate mercantile speculation having lost him nearly the whole of his pecuniary property, his mind still remained, and he showed himself to be a disciple of Seneca in being "externis rebus potentior." His philosophy did not forsake him; he fixed himself at Bayswater, resumed his labours, and began the arrangement of the "Encyclopædia of gardening." For this purpose, he travelled into France and Italy, visiting Pompeii and Herculaneum, and the wonders of that classic land. He returned by Venice, Padua, and Geneva, to Paris, Brussels, Ghent, Bruges, and Ostend, thence to England. In 1822, the fruits of his travels appeared in the first edition of the "Encyclopædia of gardening," and in 1825, there appeared the "Encyclopædia of agriculture." In 1826, he issued the "Gardener's magazine," the first periodical devoted exclusively to horticultural subjects. He again visited the continent of Europe, in the lower regions towards the German ocean, for the purpose of getting materials on the subject of agriculture. He married in 1830, and continued his labours and journeys over Britain in quest of any knowledge that could be seen or heard. He again visited France, for the purpose of examining some trees in the Jardin des Plantes, and remained two months. He laid out the plan of several arboretums; published several periodical works, "The book of cottage farm and villa architecture," "Encyclopædia of trees and shrubs," and lastly the great work, the "Arboretum." During the last ten years, his constitution had suffered from severe exertions both of mind and body, rheumatism had shattered the corporeal frame, but the former shone unscathed. The lungs were at last affected, and showed proof that an ultimate recovery was impossible. He hastened to put his affairs in order, being entangled by a mortgage of his income from the published works to pay the expenses of issuing the Arboretum, and one of the creditors, the engraver, becoming a bankrupt, the assignees pushed Mr. Loudon for payment, threatened an arrest, and to proclaim a bankruptcy. His honorable and sensitive mind most deeply felt the indignities offered him, reluctantly consented to other sacrifices in order to satisfy the clamour of importunate demands; and in the midst of doing so, he died in the arms of his wife in Dec., 1843; the confirmed disease was bronchitis. The debt was not long in being cleared by the sale of the remaining copies of the Arboretum, and in the final settlement honour was most honourably satisfied.

The works of Mr. Loudon being numerous and valuable, a careful enumeration is required, and the publications are stated in the following arrangement, being the order and catalogue of the library of the British Museum. The strictly gardening works are omitted, as not belonging to our purpose.

"A treatise of forming and managing country residences;" 4to., London, 1806. "An account of the paper roof used at Tewlodge, Oxon;" 8vo., Oxon, 1811. "Designs for laying out farms and farm-buildings in the Scotch style, adapted for England;" 4to., London, 1811. "An encyclopædia of agriculture;" 8vo., London, 1825. "Supplement to it;" 8vo., London, 1844. "The encyclopædia of cottage, farm, and villa architecture and furniture;" 4to., London, 1833. "A supplement to it;" 1842. The horticultural works are more numerous and equally valuable.

A very large merit in the agricultural world must be ascribed to the works of Mr. Loudon. The book of Cottage, Farm, and Villa Architecture contains a mass of information that is, in our opinion, unequalled of the kind, and on varied subjects which it comprehends. The materials were collected from every quarter that could afford a mite of contribution, and were assorted and arranged with much skill and discrimination. The encyclopædias of agriculture and gardening are alike valuable for the varied contents. An acceptable simplicity in writing was the characteristic quality of Mr. Loudon's professional emanations; he very particularly excelled in putting together and setting afloat in a

marketable condition the varied wares which he found the means of collecting and keeping in store. This quality is in many cases more useful than the flash of genius and the soarings of originality ; at least it reduces them into use.

Mr. Loudon was an indefatigable tradesman, and a most zealous promoter of every art and science that can employ the time or engage the attention of the human race. Quick in apprehension, he was equally cool in judgment ; and his reflective discrimination seldom failed in reaching conclusions that were equally just and tangible. An equanimity of temper never at any time forsook him, and there is no better index of a mind being stored with learning and regulated by scientific liberality. Perhaps no man that ever lived had so thoroughly dispossessed his mind of any feeling of sect or self, or had more completely vindicated the right of persons or things to be heard and judged irrespectively of any adventitious attachments. His mind seemed a perfect specimen of primeval simplicity, and of the most comprehensive benevolence ; an abundant charitable feeling pervaded every word and action. He was beloved in his domestic relations, and much esteemed in the circle of professional and general acquaintance ; every person concurred in raising his statue while he lived. He erected his own monument. The writer of this biography never had any post or pension from him, which could bribe his opinion or bias his judgment ; but he enjoyed for fifteen years his sincere and disinterested friendship, which was the greatest favour he had to bestow.

The present occasion must not be let slip of acknowledging the obligation of this biography to a list of British authors on agriculture compiled byMr. Loudon, and printed in the end of the Encyclopædia of Agriculture. Lists are also given of the French, German, and Italian writers on rural affairs. These chronologies had cost immense research, and a vast labour, as are everywhere evinced by the works of Mr. Loudon.

CCXCVI.—Luccock, 1806.

John Luccock, woolstapler at Leeds, wrote "The nature and properties of wool illustrated, with a description of the English fleece ;" London, 1806, 12mo., price 5s. 6d. "An essay on wool, containing an examination of the present growth of wool in every district throughout the kingdom, and the means pointed out for its improvement ;" 1807, price 8s. 6d. These works are not found in the National Library : the above authority comes from the Bibliotheca Britannica, and Loudon's list of authors.

CCXCVII.—Somerville, 1806.

Robert Somerville, a surgeon in Haddington, wrote "General view of the agriculture of the county of East Lothian ; drawn up from the papers of the late Robert Somerville ;" London, 8vo., 1806. The author died in 1803. The report occupies 326 octavo pages, in eighteen chapters of well arranged and highly useful matter. A geological map accompanies the view of the county ; and the appendix is long, containing analyses of various soils, extent of sea-coast, and thirlage. It is an excellent report, and contains the agreement between Fletcher of Salton and James Meikle, who was sent by the former into Holland to learn the art of sheeling barley ; dated, 17th April, 1710. Fanning machines came from Holland about the same time.

CCXCVIII.—Aiton, 1806.

William Aiton, sheriff-substitute for the middle ward of Lanarkshire, wrote "Essay on the origin, qualities, and cultivation of moss-earth ;" Glasgow, 1806, 8vo., price 3s. 6d. Ayr, 1811, 8vo. "General view of the agriculture of the county of Ayr, with observations on the means of its improvement ;" Glasgow, 1811, 8vo., price 18s. "General view of the county of Bute, with observations on the means of its improvement ;" with engravings; Glasgow, 1816, 8vo. None of the above works is found in the National Library, nor any notice of the author's name ; the above statement comes from the Bibliotheca Britannica, and Loudon's list of authors. The author has always been reckoned a very sensible writer, enlightened, and at the same time practical in a degree beyond the usual understanding from persons of that grade of society. When this happens, the bests results do follow.

Our own private library by some means got possession of the "Essay on peat-moss," which is an octavo volume of 357 pages, with a long preface and a lengthy introduction. Very much room is occupied in discussing the quality of the modern and ancient climates of Britain, enquiring into the origin of peat-moss, describing the woody and grassy elements, and the future construction. The same related the improvements that have been done and the modes of procedure, the results and encouragement they afford. But the soils mentioned are not mosses, but moss-earths, and placed on a locality to which the means were accessible. Pure mosess are high in position, and in climates that defy the maturation of crops, and the consolidation does not sustain the implements or animals of work. And after all that has been written and spoken on the subject, the improvement of real moss may be safely pronounced to be an impossible performance : the nature of it forbids any culture.

CCXCIX.—Owen, 1806

Rev. T. Owen, M.A. rector of Ripton Scudamen,

Wilts, published "The three books of M. Terentius Varro, concerning agriculture, translated into English;" London, 1800, 8vo., price 5s. 6d. "Agricultural pursuits, translated from the Greek;" London, 1806, 2 vols., 8vo., price 15s. "Translation of the fourteen books of Palladius on agriculture;" London, 1807, 8vo., price 8s. The National Library contains only the first work of translation in the works of Varro, which is an octavo volume of 257 pages, with notes and references. The character of these translations has been that of honest performances.

CCC.—Capper, 1806.

James Capper, Esq., colonel in the East India Company's service, wrote "Observations on the cultivation of waste lands, addressed to the gentlemen and farmers of Glamorganshire;" London, 1806. "Meteorological and miscellaneous tracts applicable to navigation, gardening, and farming, with calendars of flora for Greece, France, England, and Sweden;" London, 1809, 8vo. The first work is wanting in the National Library; the second is an octavo volume of 211 pages, relating to different temperatures of air, aspects, storms and waterspouts, whirlwinds, and heights of the thermometer. But for the first mentioned work, which is not found, this author would not be ranged among agricultural writers.

CCCI.—Cochrane, 1806.

The Hon. and Rev. James Cochrane, Vicar of Mansfield, &c., wrote "Thoughts concerning the use of clay marl, as manure; on the uses of agricultural salts; on decomposing pit-coal, wood, peat, sods, and reeds for manure; also on coal tar, &c.;" London, 1806, 8vo., price 2s. The libraries of the British Museum do not contain this work, nor any notice of the author's name, and Loudon's list of writers does not mention it. The authority rests with the Bibliotheca Britannica, which makes the above statement, and quotes three short theological works by the author. A regret is due to the loss of any allusion to agriculture from an education that is superior to its own; the suggestions, if not at once thoroughly practical, often contain the germ of future utility.

CCCII.—Malcolm, 1806.

James Malcolm, land surveyor, wrote "A compendium of modern husbandry, principally written during the survey of the county of Surrey, in 1794, with an analysis of manures, an essay on timber, and a variety of miscellaneous subjects;" London, 1806, 3 vols., 8vo., price 36s. "Excursion, in the counties of Kent, Gloucester, Hereford, Monmouth, and Somerset, in the years 1802, '3, and '5;" London, 1805, 8vo., price 27s.

The Compendium of Modern Husbandry is a work of very considerable merit; the other book is not found in the National Library. The map of the county of Surrey is coloured into clay lands, loamy soils, sands, light sands, and red sands about Reigate. The geology is very deficient in wholly omitting the gault clay, which forms the black lands at Godstone, and is a rare specimen of that fossil. The professional employment of the author led him to travel and see many different practices, by which the mind is opened to instruction, and becomes habituated to strange entertainments. He had got over the prejudice about paring and burning, and gives on that subject a very just and dispassionate opinion. On most practical points, his judgment is generally correct, and when he differs, the reasons are stated with much candour and fairness. The work is the modern husbandry of South Britain only, and of that part of the district in which the author resided; it has little relation to modern husbandry north of the Thames. But of the southern range, the work is much the best to the time of its appearance.

SUBSTITUTION OF THE GRUBBER FOR THE PLOUGH.

For the last three thousand years, at least, the plough has been amongst the foremost of agricultural implements; for three times ten centuries it has been pretty much the same sort of implement, undergoing but little change or variation. Science did once certainly attempt to discard the wheels, and let the skill of the ploughman conduct the straight and steady line of the implement; but when more severely tested, it was doubtful whether even the most cumbrous wheels —those used in Norfolk—were not, after all, mechanically, and as viewed in regard to *draught*, absolutely more perfect than the swing plough, even in all its perfection.

And yet the plough, as an implement of tillage, is a very imperfect one. We do not mean imperfect in itself, but wish rather to be understood as speaking of the operation as being most unsatisfactory. The plough is simply a double wedge. As regards the soil above it—as regards turning on an edge at a given angle and a given depth—as regards a straight, and level, and even furrow—there are clearly no doubts but that the instrument is calculated to effect its purpose. But in reference to the

subsoil, it is the most objectionable of all machines. It literally plasters the part where its sole runs, which, if clay, forms an almost impervious substratum; if sand, it often leaves the "moorband pan" in that form of consolidated crust of sand and oxide of iron, impervious to everything but manure.

There have been several not very successful attempts to supersede the plough and ploughing. If we rightly remember, Lady Vavasour, some eight or ten years ago, invented a revolving cylinder, full of small spear-like prongs, called a spade-plough; and we observe a digging-machine announced—of which we may hear more at some of the agricultural exhibitions—patented, or at least manufactured by Samuelson. But we cannot help being struck with the success which has, in the north, attended the working of the land without ploughing at all.

We know the importance of a solid bottom and a fine top for several plants. The barley is one of those which is very impatient of a loose subsoil, while it cannot well bear a rough surface. The wheat will not grow in a very loose subsoil, though a fine surface is of far less consequence; nor can oats flourish when the subsoil is very loose. All these causes induced us to try the experiment on a light soil, of working the surface only by Finlayson's drag, and leaving the subsoil entirely unstirred. The result was a most signal failure. We were thoroughly ashamed of our crops, and have never attempted it since, so completely did it fail. We have witnessed trials also with the Ducie scarifier, after turnips eaten on, as compared with the plough, and very much in favour of the latter, even when turned over twice; and this makes us very jealous of any hasty dispensing with the plough in the cultivation of corn crops. But we are not prepared to underrate nor answer the repeated experiments of Mr. Wilson, of Edington Mains, made for the Highland and Agricultural Society of Scotland, when the whole of the trials on wheat, barley, oats, or grass seeds were most satisfactory and encouraging.

The first that he made was on barley after turnips; the soil light loam. It was grubbed after one ploughing, at the rate of four acres per day, and the crop was very tolerable. This, however, was an imperfect trial, as the plough had already been at work.

Another trial, on a "light dry muiry soil, with a sandy subsoil;" and here he tried grubbing against thorough ploughing. "The soil was stirred as deeply as was necessary," he says; "the manure was kept near the surface, where the grasses would get most good from it, and a fine mould, most suitable for the germination of small seeds, was easily obtained." On the part grubbed the grass maintained a deeper green, and has been as pasture preferred by sheep to the part that was ploughed.

A third trial was with turnips on a peaty soil, and was taken out of grass for turnips in May. Three-fourths of the field were grubbed, the other fourth ploughed. The crop on the latter portion was, however, he says, manifestly inferior. As the reason for ploughing it was alledged to be that it was not so clean, the probability is that it was either of worse quality, or certainly not so well tilled; and this a little detracts from the value of the experiment.

He then tried a bean-stubble as a small experimental plot, and found the subsequent crop not at all inferior to the land treated with the plough.

He subsequently detailed the process of cleaning land by the grubber with only an autumn ploughing; but as this was simply a partial adoption of the grubber, and not very different from the ordinary mode of cleaning stubbles, we pass it over to the most interesting part of the series of experiments, which consisted of the formidable quantity of twenty acres of land on which the turnips had been consumed by sheep—the last eaten on the ground; and in the middle of April, with an intense drought, it was of the greatest importance to him to get the seed-barley in with the least possible loss of moisture. He grubbed it, therefore, lengthwise and across, with a pass of the roller between the grubbings to break the clods which might remain, and seal up the moisture. The whole was then ribbed, and he thus speaks of the result: "The barley thus treated has proved as good a crop as that on similar land adjoining, which was ploughed in ridges, while the clovers and grass in the grubbed part are decidedly the best in the field. It will be observed that the twenty acres now referred to have thus received but two ploughings during an entire rotation, viz., one in breaking up from lea, and another after the removal of the oat crop following."

From this, though we may well wish he had supplied us with results by the bushel and the scale, it seems he has confidence in his system, and he thus sums up by saying: "It appears that the grubber *can* be substituted for the plough to a considerable extent, and with an important saving of time and labour; and I feel warranted by my own experience in saying that on *friable soils* the tillage labour of the year can be reduced to the extent of a *fifth* part merely by this substitution of implements."

Such are amongst some of the most recent efforts to dispense with the plough. We shall watch the experiments of the digging machine with great interest, and hereafter report thereon.

PROGRESS IN THE COMMERCE OF BUTCHER-MEAT, AND MANUFACTURE OF THE OFFAL INTO MANURE.

At one period it was customary for butchers to sell butcher-meat by "lump," or so much for the piece, as a leg or joint, according to appearance and size; and with the practice both buyers and sellers were perfectly satisfied. They were practically familiar with it—good judges—had experience in no other, and therefore had no reason to be otherwise than satisfied.

Science, ever active, eventually introduced weighing-machines, which, meeting with the ready approbation of that section of the public whose characteristic has ever been to follow after "new-fangled things," gave rise to a new system of exchange; but the good, old-fashioned, steady people of the day stood firm by their "lump" practice, repudiating the utopian theory of science as one of those hopeless and unpardonable innovations which could not succeed; and so tenaciously did they cling to their point, that an Act of the English Parliament was found necessary to effect a separation.

A little experience soon taught farmers, butchers, and the public that science was right, and that her deductions were in favour of all parties; and few in modern times would now think of returning to the practice of selling rounds of beef and legs of mutton without weighing them.

We still, however, adhere to some of the lump practices of our forefathers: so that the question, consequently, arises as to the propriety of doing so any longer on the one hand, and the course which ought to be followed on the other. In short, are such practices perfect? If not, what new theory does science now propose?

The practice proposed to be discussed at present is that of selling fat stock—a practice identically the same, generally speaking, as it was a thousand years ago; for farmers and butchers, in selling and buying, guess at the weight of the ox, sheep, and pigs, as did their forefathers at the weight of a leg of mutton or baron of beef. They are equally good judges as they were, and equally satisfied, it may be, with the soundness of the practice, although one far from perfect; so that, to propose a change, may be considered by not a few as great an innovation in the one case as it was in the other.

Science, however, pays no regard to the peculiar notions of such advocates of custom, however successfully conducted may have been their business; for her laws are arbitrary, her practice (so to speak) straightforward, so that she cannot deviate to the right hand or the left to please the most successful she meets with on the way. For example: it is long since she enunciated a new theory—the selling of fat stock by weight—one which has been strongly advocated and partially reduced to practice even in metropolitan Smithfield itself; proverbial for its upholding of antiquated systems, as our readers must have perceived from special notices in previous numbers of the *Mark-lane Express*—Nos. 1115 and 1116, page 9, for instance—where it is stated that "20 Scots were sold, by weight, at 4s. 8d. per stone, to two of the first west-end butchers," in the first case, and "4s. 9d. per stone of 8lbs. for 10 Scots" refused in the other. And now that a spirit of inquiry is abroad, the question very naturally arises, What benefits would such a practice confer, were it generally adopted? For, if farmers and the public are to be gainers, it would be useless for butchers, cattle-salesmen, and other intermediate parties, with whose former routine of labours such a practice might interfere, offering any opposition; for, however powerful they may be as a party, the interest of the grower and consumer must ultimately prevail.

There are two ways by which farmers sell their fat stock by weight. In the *first*, the ox or sheep (as the case may be), if not sold in its feeding-box, is conveyed to market, and there sold at so much per stone or lb. (sinking offal or otherwise) as may be agreed upon; the butcher who purchases, or else some regular slaughterman, killing and dressing the animal, in the usual manner; the four quarters to be weighed, in the presence of parties, at a stated time, so as to determine the whole price. In the *second*, the practice is, what is technically called, the "carcase trade." The fat ox or sheep is slaughtered at home, the four quarters sold to the butcher, the loose fat to the tallow-chandler, the hide to the tanner—head, fat, tripe, heart, &c., to tripe-shops; sometimes to the labourers and their families on the farm; and the balance of the offal, and indeed the whole of it, turned into manure, or given to pigs, when it cannot be more profitably converted into money.

Of the two practices there cannot be a doubt but that the latter is, scientifically, the most perfect; and hence the one which will ultimately be generally adopted. At present it is fast gaining ground, although not exactly the same in detail as above stated, an intervening class of middlemen or jobbers appearing between the farmer and butcher. A jobber, for instance, purchases from the farmer, or his cattle-salesman, at so much per head, without reference to weight as affecting the price; after the sale has taken place, slaughtering and consigning the four quarters to the carcass-market, and disposing of the offal as he best may—often to little profit.

In the metropolis, upwards of one-fourth of the oxen sold in Smithfield are bought in this manner, by jobbers, who reap an intermediate profit between the farmer or cattle-salesman and the butcher; while between one and two thousand tons are weekly received from the provinces besides. In the provinces, he is not unfrequently a drover and butcher, besides a jobber in the sense just quoted; consigning part of his purchases to the salesmen of the metropolis in a live state—slaughtering the remainder, sending the hind-quarters to Newgate, and cutting up the fore-quarters among his own provincial

customers. In London and other large towns he may be a slaughter-man, a carcass or cutting butcher, offal-salesman, or jobber only—and in a few cases, perhaps, a "money-jobber" besides.

According to the other practice, middlemen also exist; purchasing from farmers or salesmen, sometimes at so much per head; but selling to butchers by weight: while in other cases, they both purchase and sell by weight. Sometimes they may purchase for butchers who cannot attend market, on commission; in which case they professionally stand upon a degree of equality with cattle-salesmen who sell for farmers.

It will thus be seen that the commerce of butcher-meat assumes a somewhat anomalous character, when its details are fairly brought into view, and the organization and sub-division of labour duly considered; for when the farmer sells to the drover, the drover consigns to the cattle-salesman, the cattle-salesman sells to the jobber, the jobber consigns to the carcass-salesman, the carcass-salesman sells to the butcher, and the butcher to the consumer, the system appears obviously burdened with a multiplicity of sales, consignations, profits, and commissions, which demand of the farmer a second thought as to the economical character of the age in which he lives, and the obligations he lies under to himself, his landlord, and the public. This, however, is not all; for if he follows his fat ox through the various ramifications of such a system, noting down, as he progresses in his journey between his own feeding-box and the larder of the consumer, the daily waste of butcher-meat sustained in supporting animal-life under the innumerable exciting causes to which it is subject, the deterioration of quality arising from the same and kindred causes, the unpardonable account made of the offal (100,000 tons—equivalent to the value of guano almost—being annually given away in the metropolis for nothing; with probably from four to five times as much in the provinces), and the various items of expenses charged against his ox, for railway conveyance, lairage, market-dues, tolls, driving, slaughtering, and an antiquated and expensive commercial fabric, he will find more pressing reasons for the practical investigation of the subject than above noticed: for the produce of 500,000 tons of offal-manure applied to the soil, is of itself a very comprehensive question at present.

Five hundred thousand tons of offal-manure applied to the soil would not only increase the produce, but also exercise a very beneficial influence in the manure-market by lowering the prices of artificial manures from their present high level, by increasing the supply—a desideratum greatly to be wished for. The 500,000 tons of offal, however, are not yet manufactured into manure for market, much less applied to the soil, yielding golden harvests for the farmer; for they still pervade the atmospheres of our densely-populated manufacturing and commercial towns in the shape of a thousand pestilential gases, ruinous to the health of society; and before the theory under consideration is reduced to practice, the agricultural press will have to open its mouth wider on the subject; for farmers are just as perfect, in their generation, as cattle-salesmen and butchers; scarcely less so than were their forefathers, when Acts of Parliament were found necessary to overthrow antiquated systems of commerce in butcher-meat centuries ago.

In drawing this conclusion, we had almost forgotten that a spirit of inquiry was now abroad among farmers—including, we hope, salesmen and butchers also; so that those who now advocate their own doings and systems as perfect, form an exception to the general rule. But even conceding thus far, the task of getting both parties to subscribe to the contemplated changes, in all their details, will not be found much less, owing to their magnitude, and the adverse interests involved.

The parties having interests adverse to the grower and consumer, are, of course, those intervening between them—including butchers, jobbers of all grades, cattle and carcass salesmen; the latter two indirectly (partly owing to their relation with the former, and partly from circumstances of a private character) connected with the trade. Both, however, have themselves very much to blame if their labours are dispensed with; for farmers will always find it more advantageous to employ either the one or the other than leave their farms, other things being equal; but it will not do for the cattle-salesman either to fall behind in the management of fat stock, or sell to jobbers for consignation to carcass-salesmen or butchers; and, least of all, to lose sight of the manurial value of the offal at present given away by him for nought, or for carcass-salesmen to allow butchers too large a profit, much less intermediate jobbing.

In all the other branches of industry, experience has shown that the raw produce of the country can be removed to town, and there manufactured and distributed over the country again more economically than in the country itself; and it is possible, with the command of capital, machinery, and a more profitable subdivision of labour than is enjoyed by the majority of farmers, that towns may be able to give as high a price for town-slaughtered meat as country-slaughtered; and also more for the offal than it is worth, in the shape of manure on the farm. But before such results can be obtained, no ordinary degree of progress has to be made; for balances are very much against the present system. Indeed cattle-salesmen will ever find that competition with large farmers, having steam-engines, cooking-apparatus, and other mechanical and chemical aids, will require a degree of vigilance on their part not now manifested, before they can maintain their ground against the carcass trade. The fact that 25 per cent. of all the cattle sold in Smithfield are bought by jobbers for Newgate—not to mention private transactions of "20 Scots" weekly among first-rate butchers in the west-end—proves the soundness of our conclusion, so far as the metropolis is concerned.

We have put the question to more than one of the London cattle-salesmen in the plainest terms—Why they allowed jobbers a profit between them and the butcher, and not only to allow a profit, but a commission to the carcass-saleman besides? And the answer immediately received was that the jobbing-trade was a losing one—"Where did you ever know Whitechapel jobbers to make money?"

It is no joke to parry words with cattle-salesmen of

the capital, for the fact is notorious that the jobbers in question are not a money-making race, although forming a link, as it were, in the commercial chain of Smithfield, necessary to keep its antiquated fabric together. "There is little to gather behind the besom," according to the old proverb; and just so is it in Smithfield: the profits of the jobbers are extremely small, the surprise of all being that they are not greater, considering the difficulties with which the system is surrounded. Many intelligent farmers have tried to sell their own stock, but invariably to the profit of the jobber—facts which have long ago established the professional character of salesmen.

Unfortunately, however, for fallen humanity, man is never more likely to be found "dead" or dying than when he has got "a name to live"—a truism which we candidly in a friendly spirit impress upon the timely attention of London cattle-salesmen, and indeed, the whole trade generally; for the above answer is no satisfactory refutation of the proposition against which it is levelled, the rapid growth of the carcass trade keeping more than pace with the growth of the population, and the increase of jobbing proving, beyond a doubt that parties have been sleeping at their posts. It is contrary to all the laws of commerce that a losing trade shall continue thus to prosper, establishing itself on a firmer and broader basis as it increases in growth; it proves, indeed, a hopeless case, when parties have recourse to dogmas of this kind. To bandy vulgar sophisms may probably yet pass current within the political arena of Smithfield; but they are no longer fit for the loftier region of "farmer's politics."

Hitherto it has been Smithfield's misfortune to cultivate a commercial system, so to speak, whose machinery has excluded the farmer from selling his own fat stock—the very characteristic which has given rise to the jobbing and intermediate dealings of which we have just been complaining—and the same unfortunate expedient has been pursued in all our large towns, although not with the same success. Whether this latter arises from a proneness to imitate the example of the capital, we will not take upon ourselves to say; certain, however, it is, that the metropolis ought to lead a better example.

The soundness of the above conclusion will appear manifest if the facts of the case are only glanced at. For instance, no farmer would sell his fat ox to a jobber for consignment to a carcass salesman; for if he could not get his price, he would himself consign. If the carcass salesman could get £21 for his ox, and he only £20 of the jobber or butcher, he would at once, we say, consign. Hence the obvious conclusion at which we arrived in the preceding paragraph, that intermediate jobbing would be excluded, or rather, *vice versâ*, that the exclusion of farmers has given rise to jobbing.

Another view of this question may be taken, thus:—Butchers have the alternative of falling back upon the carcass-market when they think that salesmen put too high a price or weight upon live stock. Why should not the farmer enjoy the same privilege, through his salesman, as he would personally under a different system, supposing he sold for himself, as contemplated above?

It may be answered, that under such a proposition the salesman would lose his commission. But this is taking an extremely short-sighted view of the subject, for if the salesman can get more from the carcass market than he can from the jobber and butcher in Smithfield, he is obviously better entitled to his commission than he is at present.

We are sorry to say, however, that the spirit of the above objection, so to speak, has been too often taken up by farmers, who labour under the belief that if they could sell their own stock they would save the commission of the salesman. They just appear to think that if they brought the whole of their stock to market on one day, the difference, after paying their own expenses, would be considerable. But in arriving at this erroneous conclusion they obviously overlook the value of their own labours at home, in the field, in controlling their labourers and their teams, and the benefits resulting from a proper subdivision of labour; for one salesman, selling for several farmers, can always do the work cheaper than can the farmers themselves, letting alone the many other advantages which he possesses from attending weekly. Moreover, it has been shown in the leading columns of a cotemporary that instead of sending large droves to market on one day, farmers must distribute them equally over the year to regulate the supply, which settles the question on the score of expenses alone.

It may, again, be said by way of objection, that farmers must have their money immediately, and therefore their salesmen could not consign. But such an objection has no footing in the science of commerce, for an advance can be made.

(To be continued.)

ADULTERATION OF BUTTER.—From the last report of the Analytical Sanitary Commission, published in the *Lancet*, it appears that, on an examination of 48 samples of different butters, they all contained large quantities (more or less) of water and salt—in many cases as much as a fourth, or even a third, of the former, and of the latter article a great quantity is purposely added to increase the weight and bulk, over and above that which may be necessary for the preservation of the butter. A simple method of determining approximately the amount of water present in any sample is to melt the butter, fill a small bottle with it, and place it near the fire for half-an-hour or so. The water, as well as the salt, will sink, on account of their weight. The water thus separated has usually a milky appearance, conveying the impression that it contains flour—an impression, however, which, in all the samples examined, had proved to be erroneous. This appearance has doubtless deceived many, and has led to the report that butter is frequently adulterated with various farinaceous substances. The low kinds of butter known by the term "bosh" were formerly adulterated in this way, and they may still be so in some rare cases. Some years since the adulteration of butter with flour was so common that Mr. Miller, a very intelligent butter-factor, of Wellington Chambers, London Bridge, brought this subject before the Provost of Glasgow, who declared the whole of the butter so adulterated to be forfeited. More recently Mr. Miller directed the attention of the city authorities of London to this matter, but did not succeed in moving them to take any steps in it.

LONDON FARMER'S CLUB.

"THE COMPARATIVE ADVANTAGES OF THE APPLICATION OF FIXED AND PORTABLE STEAM-ENGINES TO AGRICULTURAL PURPOSES."

The usual monthly meeting—the last of the season—of the members of this club was held on Monday, June 6, at the club rooms, Blackfriars; Mr. Trethewy in the chair. The question for discussion was introduced by Mr. Allan Ransome, of Ipswich; it was, "The comparative advantages of the application of fixed and portable steam-engines to agricultural purposes."

After a few introductory words from the Chairman,

Mr. RANSOME said: At the request of your committee I have consented to introduce the discussion on the comparative advantages of the application of fixed and portable steam-engines to agricultural purposes, not so much because I have any idea that any defined rule can be laid down by which the questions that arise under the various conditions in which steam may be made applicable, but because it is necessary to your part of the consideration that you should have the knowledge of the general views of the practical engineer as touching the matters more immediately within his province, and equally necessary to us who have practically to carry out the adaptation of this great agent to your purposes; that we should be, by you, informed of the various conditions and the relative importance of these various conditions, to enable us to adapt and combine in the most profitable manner our mechanical and engineering knowledge to your wants and requirements. My remarks, therefore, will, I trust, be taken simply as intended to convey the results of my own impressions so far as my knowledge of your part in the matter enables me to arrive at a judgment, in the hope that the discussion will afterwards elicit such points as I may inadvertently have omitted. The course I propose to pursue will be to endeavour briefly to convey to you, by means of the illustrations now before you, the peculiar and distinctive features of the main varieties of steam-engines in ordinary use, confining my remarks upon their advantages or defects—to those which are desirable to be taken into account solely with reference to this question as it applies to your purposes. It may be desirable, in the first place, to describe the action of the steam-engine. This may readily be done by reference to the accompanying diagrams, but before doing so I would endeavour to explain the difference between the terms of high and low-pressure steam as applied to engines. The difference between high-pressure and low-pressure engines, or, as it may more properly be said, between the engines which are worked by steam at high pressure and low pressure. Low-pressure steam is so termed when the steam is not compressed to a greater extent in the boiler than shall be adequate to a pressure of about 15lbs. to the square inch beyond the ordinary atmospheric pressure of 15lbs. to the square inch, but as the Boulton and Watt engine was calculated to work at 4lbs. or 5lbs., we will take the latter as the pressure assumed for reference. High-pressure steam is so termed when the steam is very highly compressed, say to a pressure of ordinarily 45lbs. to 60lbs. to the square inch beyond atmospheric pressure. It will easily be seen that with a pressure of steam equal in the one case to only 5lbs. to the inch, and in the other to 45lbs. upon the inch, that the cylinder of the one class of engines must be of much greater capacity than that of the other to produce the same effect; but the contrivance of the condenser and air-pump enabling the piston to work in partial vacuum, increases the effect of the steam working at 5lbs. pressure above the 15lbs. ordinary atmospheric pressure. By the withdrawal of the atmospheric pressure from the opposite side of the piston to that immediately under the action of the steam pressure, and thus the direct force of the 5lbs. pressure given by the steam, added to the force of 15lbs. obtained by the withdrawal of the atmospheric pressure, which would be otherwise in resistance, would give a force—in a low pressure engine, working by the aid of the condenser—equal to 20lbs. on the inch, but practically, inasmuch as the vacuum obtained is imperfect, not exceeding 13lbs. or 14lbs. to the inch; the absolute pressure, however, does not exceed 18lbs. or 19lbs. The engine shown in the drawing, and known as Bolton and Watt's engine, is to this day as good a type of the engines of this class as can be selected. It may be as well here to describe that engine. I have selected a very popular form of description, namely, that published by Reynolds; and while I am reading it, my excellent and valuable assistant—Mr. Henry Warriner, to whom we are indebted for the diagrams—will pass his finger along the different parts of the engine described. *The cylinder*:—This vessel is formed of stout iron, closed at top and bottom, its interior surface being turned perfectly true and smooth. It is furnished with a piston, fitting with great accuracy; to the piston is attached a thick iron rod, accurately turned, and running through a stuffing-box, kept steam-tight by a packing of hemp and tallow. The steam being introduced into the cylinder, and exerting its elastic force according as it is alternately admitted and withdrawn below and above, causes the piston and rod to ascend and descend by an alternate and uniform movement. When the piston has arrived at the top of the cylinder, the lower part is full of steam. To produce a vacuum, so that the piston may be readily depressed by the introduction of steam above, the steam below must be removed. For this purpose, a valve at the lower surface of the cylinder is opened, allowing the escape of the steam into the condenser, to which it im-

mediately rushes. But while this has taken place, the passage to admit the steam above the piston is opened, and, as it enters immediately by its elasticity, it depresses the piston to the bottom part of the cylinder; it is now to be raised again to the top of the cylinder, and this is effected by the very same arrangement as that employed to bring it down. The steam which is in the cylinder above the piston is now, by the shifting of the valve, allowed to communicate freely with the condenser, escaping by the upper aperture of the cylinder; in this manner a vacuum is produced above, and the steam simultaneously being admitted below, the ascent of the piston takes place to the upper part of the cylinder. Thus, by a continued succession of this alternate ascent and descent of the piston, motion is communicated to the beam, and thence transmitted to the rest of the machinery. *The condenser and air-pump*:—The condenser consists of an hollow cylindrical vessel, with which the cylinder communicates by means of a large tube. At the bottom part of the condenser is a valve connecting it with the air-pump; this valve is so constructed as to permit the escape of fluids from the condenser to the air-pump, but not from the air-pump to the condenser. The apparatus is surrounded with cold water, and by means of the injection cock a jet of cold water is constantly thrown into the condenser; this immediately condenses or absorbs the vapour of steam, so that a vacuum, comparatively speaking, is formed: for, one cubic inch of water expands into 1728 cubic inches of steam, and therefore the converse takes place during the condensation—that is to say, the 1728 cubic inches now occupy a space of not more than one cubic inch. The steam, therefore, after performing its duty on the piston, proceeds to the condenser, where it is instantly transformed into water. By this operation the condenser would soon become filled with injection water, condensed steam, and air, which enters along with the steam, did not the air-pump remove them. This it does in the following manner: The piston of the air-pump, having valves opening upwards, being drawn up by means of its connexion with the beam of the engine, a vacuum is produced beneath it; the valve between the condenser and the air-pump allows the fluids in the former to rush into the latter vessel, and occupy the space beneath the piston. On the descent of the latter the valve immediately closes, and prevents the return of the fluids to the condenser; accordingly, from the compression they are exposed to, they force open the valves of the air-pump piston, and accumulate on the upper part; on the ascent of the piston, they are lifted by it and transferred to the hot-well. By this series of actions, regularly continued while the engine is at work, are the fluids in the condenser constantly withdrawn from it. The water removed from the condenser, being warm, is not altogether wasted, but part is returned to the boiler, being drawn from the hot-well, and driven to the cistern supplying the feed-pipe of the boiler by means of the force-pump, as shown in the diagram. At the back of the force-pump is seen the cold-water pump supplying the cistern, in which the condensing apparatus is placed. An addition to the original Boulton and Watt engine was invented by Arthur Woolf, and used in some Cornish engines many years ago, and within the last ten or fifteen years has come into extensive use. It consists of a second cylinder, working on the high-pressure principle, for the purpose of first taking the benefit of the actual pressure of the steam as it comes from the boiler; and instead of allowing it to escape into the air, as in ordinary high-pressure engines, it is conducted—after having performed its work on the piston of the high-pressure cylinder—into the low-pressure cylinder, where its works expansively, and, having performed the stroke, it becomes subject to the action of condensation; and the principle of the low-pressure is thus combined with that of high-pressure—converting steam, that would otherwise be wasted, to a force which enables the power of the engine to be nearly doubled. This is probably the most perfect and effective engine of any. You will perceive that by the introduction of the second cylinder, which works after the best manner of a high-pressure engine, you get nearly double the power that you had in the original engine; and I have very little doubt that—should the time arrive when agriculture will require the aid of steam on an extensive scale—the high-pressure and condensing engine will be the favourite. I am now about to describe some of the forms of high-pressure engines, and I take this general form, *i. e.* the Boulton and Watt, as equally adapted to high-pressure and to low-pressure, and whether in its original character, as worked by steam at low pressure, or at high pressure, with second cylinder and condensing apparatus, it is deservedly popular. The prestige which attaches to it as being the earliest form in which perfection was attained by Watt, its massive and imposing appearance, the quiet and majestic alternations of the dip in its beam, the graceful action of its parallel motion, and the elegance and harmony of all its movements, all carried on with a precision and regularity unaccompanied by noise, convey to the beholder an impression of quiet and determined power working out a resistless will, and compared with which the bustling energy exhibited in the rapid and almost furious efforts of the ordinary high-pressure engines sinks into insignificance. Where the scale of operations to be performed is large, and the labour continuous, and where it may be desirable almost irrespective of the consideration of first outlay to attain any and every refinement that tends to economy in working, to the reduction of wear and tear, or to lessen the risk of stoppage for repairs, there is little doubt but that engines of this class are decidedly the best to be adopted. But for agricultural purposes, where we may assume that engines of six or eight horse power will be the utmost that, under any circumstances, could be needed, their great bulk and large original cost, the expensive character of the buildings and foundations for their erection, the much larger supply of water required for their consumption, and the somewhat higher qualifications needed in the engineer or attendant, all combine to render them less applicable than the simpler character of high-pressure engines, which I will now proceed to describe in the various forms likely to be most available for the purposes to which this discussion is limited. Having described Boulton and Watt's engine as a condenser, let me say,

that if you wish to use it as a high pressure engine, by doing away with the condenser, you obtain the same results as from other high-pressure engines. But there is one disadvantage attending it, namely, that it is bulky, and composed of many parts; and I think that for agricultural purposes an engine of simpler form would be found more useful. With regard to the high-pressure Beam engine, it will easily be seen that this form of engine may be adapted as well to be operated upon by high-pressure steam as by low-pressure, the chief difference lying in the substitution of cylinders of less diameter, and the abandonment of the air-pump and condensing apparatus. For small powers, its greater first cost is the chief objection to its ordinary use for agricultural purposes. We next come to the Pedestal engine. This is more adapted to small powers, and less expensive in its first cost than the beam engine, though somewhat more liable to wear and tear from the friction of guide bars in the one as compared with the parallel motion of the other. As it admits the use of a longer connecting rod than either the vertical or horizontal direct acting engines, the friction of the guide bars is, however, less than in these; although, from the greater simplicity of the horizontal engine, I should give the preference to the latter. The vertical direct acting engine is about equal in first cost to the pedestal. It occupies about the same space, and is rather more simple in its parts, having but one connecting rod, and is desirable where it is required to have the crank-shaft overhead. The Oscillating engine is, as the model shows, of very compact and elegant construction. Its adoption is of great importance where space is very limited. The movement taking place on the trunnions of the cylinder, the need of guides is avoided, and it works with less friction than any others. These qualities render it very valuable for marine purposes; but inasmuch as the construction of the slide-gear is necessarily complex, it is not suited for ordinary agricultural purposes where space is ample. The horizontal direct acting engine differs from all those previously mentioned, in placing the cylinder in a horizontal instead of a vertical position. This arrangement secures much greater compactness and solidity of all its parts. The cylinder being bolted firmly on a rigid foundation-plate, of which the plummer block for the bearings of the crank-shaft forms a part, the whole of the working strain is confined within two points rigidly connected, instead of between a system of framing, more or less complex, necessary in the construction of all the engines previously described. From this cause the horizontal engine has the greatest amount of stability, and is less liable to get out of repair from the strains to which the framing of every other class of engine is exposed. Every part of the engine is under the eye of the engine-man. It is more easy to clean and to oil, and its extreme rigidity admits its being safely worked to a higher velocity. The guide bars are not more subject to wear than those of any other direct action engine; and, if they are well proportioned, fitted with efficient lubricators, and kept free from dirt, the amount of wear and tear is in reality not worth consideration. I am aware that an idea exists, that the cylinders are liable to become oval from their being placed in a horizontal position; but experience shows that this is not the case. It is possible that in badly constructed engines, the frame or body of the piston may have been allowed to rub on the lower part of the cylinder, and thus have caused the lower part to wear; but if the packing of the piston and its springs are properly constructed, the guide blocks of sufficient size, and a proper bush fitted into the cylinder cover, there is really no tendency to wear the cylinder oval. The metallic packing only should be allowed to touch the sides of the cylinder, and the friction arising from its own weight is all that ought by any possibility to tend to wear; and, in ordinary engines, this weight is so small, that practically it may be disregarded. I have recently caused the cylinder of a six-horse engine (the same that was exhibited by us on an agricultural engine at the Southampton meeting nine years ago, and which has been doing full duty in our factory unremittingly for nearly eight years) to be carefully examined as to this point, and I can positively state, that by any of the ordinary means used by engineers for testing accuracy of form, no tendency to oval could be detected. Having briefly described the various forms of engines, and arrived generally at the conclusion to recommend the horizontal engine as the one better adapted to agricultural purposes than any other, it now remains to compare this with the portable engine as at present used. Portable Engines:—The difference between this and the horizontal fixed engine lies almost entirely in the adaptation of its boiler and carriage to render it easily portable. Supposing the boiler to take the place of the solid cast-iron framing used in the fixed engine as its foundation, its position, and the dimensions of its working parts, as also its velocity, may be taken as identical. The distinctive feature is the form and principle of the boiler; and this brings us to the consideration of the general forms of boilers—one of the points upon which the discussion of this evening in a great measure hinges. To complete this description of the portable, we will now describe the form and principle upon which its boiler is made. The advantage of the multitubular boiler as adapted to these engines, lies in the diminution of space occupied and in weight, rendering it almost the only form by which the generation of steam in sufficient quantity can be obtained in combination with such limitation of weight as brings it within the convenient power requisite to move it from place to place. The weight of a portable boiler, capable of generating sufficient steam for a six-horse power engine would be about 20 to 22 cwt., whilst the weight of a Cornish boiler, capable of generating the same quantity of steam in the same time, would be from 35 to 38 cwt. I am of opinion, that as regards the economy of fuel, if both be properly managed, no material advantage attaches to either over the other. Certainly no advantage in this respect lies on the side of multitubular. The question then, as between the two forms of *boilers*, (supposing them to be both used in *fixed engines*), is narrowed into the comparison of the economy of their first cost, their liability to wear and tear, and the amount of attention required to keep them in effective working order. We will assume the cost of the Cornish boiler for an engine of six-horse power, made with best Staffordshire plates

Lowmoor plates for flue, and with necessary fittings to be about £65, and that of a portable tubular boiler at £95, or with copper fire-box and brass tubes £125. From the observations we have made, we calculate that in the course of twelve years the expenses of renewal of the ordinary iron tubular boiler (at which time it would probably admit no further repair) will have approached £100, or averaging £8 per annum. With copper fire-box and brass tubes, its duration may be reckoned at probably 16 years, and its cost during the 16 years may probably not exceed £50—thus leaving a balance in favour of the copper fire-box and brass tubes of four years extra duration, at a cost which, taking into consideration the enhanced first charge would be £80 over 16 years, or about £5 per annum. This must be taken as an approximate estimate, as at present we have not had adequate experience to form an entirely reliable judgment. A Cornish boiler, under the circumstances, would probably last without need of repair for 16 years, and with renewal of the fire tube, at a cost of £20, would last an equal length of time, and bear at the termination another renewal; this would give a duration of at least double that of the best constructed multitubular boiler, at a cost of less than 15s. per annum, and over the multitubular boiler with iron fire-box of at least three times its duration. If this difference exists under circumstances of good management, and in a fixed position, the balance of economy will certainly be thrown still more against the multitubular boiler under the circumstances of its locomotive existence, and the uncertainty of its regular use. This uncertainty may be common to either the fixed or portable engine; but, in the case of the Cornish boiler, such uncertainty of use would, from its less susceptibility of damage, be unappreciable. Added to this, the attention required in working and cleansing is far greater in the multitubular boiler than in the Cornish. While actually at work, the one may be safely left for 15 to 20 minutes; while the other requires constant and unremitted attention. This does not depend altogether upon their distinctive construction, but even more upon the necessity for the limitation of weight and bulk to crowd the utmost available power into the smallest possible space. Hence it may be inferred that, for fixed purposes, the Cornish boiler is decidedly the best; but, from its bulk, this is utterly inapplicable to any other than fixed engines. I have in the foregoing remarks, attempted to show that, under all the circumstances, the engine generally most applicable to agricultural purposes, and for powers up to six or eight-horses, is that shown as the horizontal engine, if to be used as a fixed engine with the Cornish boiler, and if to be used as a portable engine with a multitubular boiler on wheels. The circumstances under which they are to be used, or under which it may be desirable to use the one rather than the other, forms the question of this discussion, and can only be ultimately determined by the importance attached by yourselves to the operations the two kinds of engines are competent to perform. On the one hand, there is in favour of the fixed engine greater economy in first cost, greater durability, less liability to hindrance from stoppage for repairs, less annual cost for repairs, and less ability and attention required to make it work to its fullest advantage. And where the arrangements upon a farm admit of such concentration as to admit its general employment in thrashing the crop, grinding the corn, cutting the chaff, steaming food for cattle, or sawing wood at one homestead, there is not a question but that a fixed engine would be greatly preferable. On the other hand, it may be urged in favour of the portable engine, that on large farms, and, indeed, on most farms of such extent as would require a steam engine of any kind, that a large portion of the crop may advantageously be stored at other parts of the occupation than the homestead; that by means of portable engines, the crops may often be advantageously thrashed directly from the stack, and the expense of removing into the barn altogether avoided, and doubtless, where the straw may be made use of in the near neighbourhood of a distant yard, this is a great advantage. It is also an argument justly used in favour of portable engines, that inasmuch as on most farms there could scarcely be found full employment for a steam engine, the use of the portable engine might be shared by two or three others residing in the locality. The advantage resulting from a compact arrangement of machinery at the homestead is not necessarily confined to the fixed engine: the same arrangements, the same line of shafting, and the same separate machines may be placed as readily to be driven by the portable machine whenever it is brought to a given spot as by the fixed engine placed permanently there. The discussion may safely commence at this point. The question must be determined upon the peculiar conditions which, under the circumstances of each occupier, may throw the balance of convenience *versus* economy into a preference for one over the other. For my own part, were I farming to the extent of 400 or 500 acres, and my homestead fairly situated near its centre, I should prefer to erect a stationary engine; were my farm much smaller than this, I should probably content myself with the opportunity of combination in the purchase of a portable one, or avail myself of the advantages offered by the itinerant steam engine thrashing for hire; but if the occupation should be one which, from its extent, involved the necessity for outlying premises and stacks at considerable distance from the homestead, I should arrange my general machinery at home in such a manner as that it should be driven by a fixed engine, and avail myself of the opportunity of combination with others, or of hiring occasionally for the distant yards. (Cheers).

Mr. C. W. Johnson said he thought there could be but one opinion as to the value of the address which they had just heard (cheers). Having long had the pleasure and advantage of Mr. Ransome's acquaintance, he had expected something interesting, and he certainly was not disappointed. They had had a most entertaining and instructive lecture on what was usually considered a dry subject (Hear, hear). They were all aware that details with regard to the steam-engine, without previous knowledge of the beautiful principles of its construction, were not adapted to excite much interest; but in the present case there was no ground for complaint on that score. He was glad that Mr. Ransome had left pretty much as an open question the comparative advantages of fixed and portable engines. For himself, he must

confess that he was rather in favour of fixed engines, wherever it was possible to introduce them (Hear, hear). There was one application of fixed engines of which, he thought, the farmers of England had not yet sufficiently availed themselves: he referred to their use for the purpose of raising water for irrigation (Hear, hear). Having paid considerable attention to the use of water in agriculture, both in what was commonly termed its pure state, as found in the bright-flowing streams of some of the chalky counties of the south, and also in its impure state, in the case of the sewage water of towns, he was convinced that agriculture had not yet derived from this source all the benefit that it might receive. Nor did he consider the application of the steam-engine to the raising of water a question of minor importance; but, viewing it in connection with the growing advantages of stock farming, and believing that the period was rapidly arriving when every effort would be made to increase the production and the food of stock, he believed the steam-engine would be found one of the most valuable instruments ever yet brought within the power of the farmer (Hear, hear). Latterly, at Edinburgh and in some other Scotch districts, after water had been used for the purpose of irrigating grass lands being allowed to flow over the field, through its own gravity it had afterwards been applied a second time by means of the steam-engine. In this way, after being used once, it had been applied to other and larger portions of land with very advantageous results. He was perfectly aware that it was not every farmer who had access to foul waters; he referred especially to sewage waters: but there were a great many farmers situated in the neighbourhood of streams which did not at present flow on the land by their mere gravity, but which might be made to irrigate it by means of the steam-engine. He had recently taken occasion to consider the expense of the operation; for in all his lucubrations for the benefit of farmers he had an old-fashioned habit of looking at the question of pounds, shillings, and pence (Hear, hear). Some time ago, in his investigations on this very subject, he had occasion to apply to his friend Mr. Allan Ransome for some information with regard to the powers of the steam-engine, and that gentleman kindly gave him some facts which he was sure would meet with due consideration. He supposed that it was required to give a certain quantity of land a thorough soaking, such an one as the farmers who tenanted the great water-meads of the chalk formation were in the habit of applying to them. He wished to know, in the first place, what would be the expense of raising the requisite amount of water. Well, then, in reply to his application, Mr. Allan Ransome, through his partner, Mr. May, gave him this most valuable information. One cwt. of coals, burnt in the boiler of a steam-engine—the pumping apparatus being good, and adapted to the engine—would, it appeared, raise one foot 1,600,000 gallons of water. The same quantity of coal, if the water was to be raised two feet, would suffice for 800,000 gallons; while in the case of four feet, it would enable them to raise 400,000 gallons. So that the consumption of 1 cwt. of coals—the cost of which was in most places not more than a shilling—would enable them to raise a body of water sufficient thoroughly to saturate an acre of land (Hear, hear). He need hardly remind them that, supposing these saturations were required, as was the case with the Edinburgh meads, to be repeated eighteen times in the year, they had then ordinary grass-lands converted, at an expense of 18s. per annum, into water-meads; and it was for all present to consider whether the conversion of grass land, with its crop or crop-and-a-half per acre into land which produced three or four crops was not a matter worthy of their attention (Hear, hear). He was quite aware of the impossibility of laying down absolute general rules: he well knew that a plan which was readily applicable in one part of the country was totally inapplicable in another; but, at the same time, he was convinced that the power of the steam-engine, more especially in reference to the raising of water for the purpose of irrigating grass-lands, was yet in its infancy, and would ere long be carried to a much greater extent (cheers).

Mr. R. Baker said he felt scarcely competent to speak on this subject. Although as an amateur he had paid some attention to the construction and use of the steam-engine, yet on such a question as that of "the comparative advantages of the application of fixed and portable steam-engines" he did not feel competent to pronounce a decided opinion. There was one remark which occurred to him at the outset, namely, that as the agriculturists of this country were now required to compete with the whole world, it was impossible for them to work successfully without the aid of science and machinery. (Hear, hear.) If the task were set them of making the same tale of bricks as formerly without the former allowance of straw—(laughter)—they must resort to the same means as others, or clearly they must fail in the race. (Hear, hear.) At one time he had declared it to be his opinion that machinery would not be used, because the farmer, with the small means usually at his disposal, could not expend the money required to purchase it. It now appeared, however, that that difficulty was removeable by combination. Where one individual could not expend £300 in the purchase of an engine to thresh his corn, thirty individuals, by subscribing £10 each, accomplished the same object conjointly. (Hear, hear.) That remark applied to the locomotive engine; and he thought that in the present state of things that form of engine was likely to be employed more extensively than the fixed engine. (Hear, hear.) Where the occupation was large, and the means ample, a fixed engine would perhaps be found most advantageous; but under ordinary circumstances the locomotive appeared to have the preponderance of advantages. In that discussion they ought not to lose sight of what machinery had done, or of what it was doing, for the advancement of agriculture. There was, for example, a small machine called "the drill," which had alone, he believed, reduced the cost of cultivating arable land not less than 4s. per acre. (Hear, hear.) When they had arrived at the ultimatum of a steam-machine for ploughing—(laughter)—the work would be complete. (Hear, hear.) He did not despair of that result. At one period of his life he entertained strong prejudices against all machinery for agricultural purposes, believing it to be injurious to the labourer,

and in its tendency opposed to the true interest of the country. That was, he hoped, a humane objection. (Hear, hear.) He had, however, altered his opinion. He did not now fear any surplus labour—(Hear, hear)—and the farmer having been compelled to enter into competition with the foreigner, he felt it to be absolutely necessary that he should avail himself of all the aids within his reach. (Hear, hear.) If they were brought into competition with countries which produced corn at a cheaper rate than they had been in the habit of producing it, they must discover and apply means of cheapening their own production; otherwise, indeed, it would be impossible for them to produce corn at all. (Hear, hear.) By means of the application of machinery to every other process of manufacture, this country had risen to a pitch of greatness which no other country had ever attained. Agriculturists were generally supposed to constitute a class who were not prone to advance with their fellow-men; but if they did not hold back the wheels of progress, they might now hope to prosper with the aid of machinery. As one who had always felt an ardent desire to serve his brother agriculturists, he could not help thanking Mr. Ransome for having introduced the subject in the manner that he had done. He was quite sure that the public at large, more especially the agricultural community, were indebted to that gentleman and his firm for a large proportion of the prosperity which they then enjoyed. But for the application of machinery to agriculture, combined with concurrent and unexpected circumstances which he need not mention, it would have been impossible for farmers to maintain their position; but he did not now despair of seeing England, in agriculture as in manufactures, the greatest country in the world. (Hear, hear.)

Mr. THOMAS said no one could have listened with greater pleasure than he did to the eloquent lecture of Mr. Ransome; and he believed the tendency of that lecture was to cause steam-machinery to be used far more extensively than it was at present in connection with the cultivation of the soil. Four years ago it was his lot to open a discussion, in that very room, on the subject of machinery, and he then dwelt on the unavoidable necessity which there was, that the farmers of England should use machinery to a larger extent. He showed, that so far from the employment of machinery being any disadvantage to the labouring poor, it would, in the long run, be an advantage to them; inasmuch as, by increasing the productive powers of wealth, it would enable the farmer to employ more and more hands, and to bring his land into a higher state of cultivation. To his amazement those doctrines were met with a perfect storm of dissent, and the conclusion which he drew was negatived by a majority of more than two to one. He congratulated the club on having changed its opinion. (Laughter.) He had always felt that the support of the poor was no more incumbent, morally, on the farmers than on any other portion of the community; and when he saw the manufacturing districts in such a high state of prosperity, in consequence of the use of machinery, he could not doubt that similar causes would produce similar effects in the case of agriculture (Hear, hear). He must not, however, wander too much from the question on the card, namely, the comparative advantages of fixed and portable steam-engines (Hear, hear); and indeed he should not have spoken at all, had not his own experience enabled him to say a few words on the merits of that question. Two or three years ago he erected on his farm a fixed steam engine, which served for threshing, winnowing, the grinding of malt, and various other purposes. In consequence of the breaking of one of the cranks, he was obliged to have recourse for a time to a portable engine; but so great was the discomfort of threshing in the open air, so numerous were the inconveniences connected with this temporary substitute—circumstances many of which were incidental to and inseparable from our climate—that he felt, and all his men shared with him in feeling a strong desire never to see a portable steam engine on the farm again. So manifest, in his opinion, was the superiority of a fixed engine, to so many purposes could it be turned, that he thought that where there were two or three homesteads it was better to have even two or three fixed engines than to endure the inconveniences of portable ones. It would ill become him to enlarge on the comparative merits of different kinds of engines after what they had heard from Mr. Ransome. Thus much, however, he must say from experience, that for general agricultural purposes there was no boiler at all equal to the Cornish boiler (Hear, hear). His own engine was so simple in its construction that an unlettered ploughman, who had been the sole manager, had conducted its operations without, he believed, having been ever led into a single accident or mistake. And here he felt bound to state, in justice to Mr. Smith, that by means of the indicator, of which he was the inventor, and which showed at all times the degree of pressure, he had saved at least £10 a year in coal (Hear, hear). It was his firm belief that in the course of a very few years there would be scarcely a portable engine to be seen on a farm. He believed that within the next years the greater part of the estates in England would be allocated in farms of such extent that only men of capital would be able to cultivate them, and that one consequence of that would be the general employment of fixed engines. Though he wished to speak with perfect respect of the small farmers, he must say that under free trade they appeared to him to be doomed; and should that prove to be the case, tall chimneys would be found as prevalent on farms as they were in the cotton districts (laughter).

Mr. BRADSHAW said, having been about to purchase a steam-engine, his attention was naturally directed to the question whether a portable or a fixed engine would be the best for his purpose; and having resided for ten years in a manufacturing district, he had the advantage of being acquainted with some of the most eminent practical mechanics in the country. Every practical man whom he consulted, including Mr. Nasmyth, advised him to have not a portable engine, but a fixed one, in order, as it were, that he might centre all the leading operations of his farm on one point (Hear, hear). The superior advantages of fixed engines were, he thought, fully established by what had been done by their neighbours in the north. If they

ascended any eminence in the vicinity of Edinburgh they would see a hundred shafts of steam-engines, and the benefits derived were indisputable. The application of the fixed engine in this country would, he believed prove equally beneficial to the farmer. Having received communications on the subject from many practical men, he thought he should have failed in his duty if he had not borne this testimony in favour of fixed steam-engines.

Mr. J. C. NESBIT said, it afforded him great pleasure to find in the year 1853 so large a number of the farmers of England assembled to take part in a discussion on the steam-engine; and not merely on the steam-engine, but on the comparative merits of two kinds of engines (Hear, hear). They were not, it was to be observed, met to consider whether the steam-engine could be used with advantage—that was now admitted on all hands—but whether the engine employed should be one fixed in a certain spot or locomotive. The attention which he had paid to the subject personally was, of course, far more theoretical than practical; but, from his theoretical knowledge, he had not the slightest doubt that for fixed engines the Cornish boiler was far preferable to the tubular boiler, both because it was less liable to get out of order, and because it would draw a greater amount of heat from the coal. In proportion as the number of tubes was increased, there was of course an increased liability to accident. As between portable and fixed engines, too, it was clear that portable engines, not being so strong as fixed, were the most liable to suffer injury. In the case of a large farm, where one engine would not be enough, he thought a number of small engines would be found to do the work best; but all who had ever used portable engines would agree with Mr. Thomas, that there were many inconveniences attending their operations (Hear, hear). With regard to an observation of Mr. Baker's, he must say that he did not believe that steam would ever be employed in ploughing land (Hear, hear). Indeed, he thought it was not in that department that farmers stood so much in need of the assistance of steam. The digging and forking of the land was the point to which he would have them especially direct their attention. About a fortnight ago he had seen, at Banbury, a machine on an old principle, called "a digging machine," in which a circular motion was employed; and he was convinced, by observation, that if ever there should be a steam-plough, the motion would be circular. He believed, in fact, that circular motion, in connection with the cultivation of the land, would be found to be one of the turning points in the history of agriculture.

Mr. PAYNE said it was not his intention, when he entered the room, to take any part in the discussion; but he had heard observations from some gentlemen present which he thought required an answer. His farm was so arranged that there were four or five homesteads, and, speaking for himself, he should say that a portable engine was decidedly the best for him, under those circumstances (Hear, hear). He could have on the farm all the other requisites; he could attach to the portable engine his chaff-cutter, and other machines. What they had to consider was not only which form of engine was the best constructed, but which was the most convenient for general use among farmers; and he was convinced, from his own experience, that there was no comparison between the two. Mr. Thomas had made some remarks with regard to danger from weather, loss sustained in moving about, and so on; but he (Mr. Payne) did not see much force in that objection, as a portable engine was, of course, kept to a great extent under cover. It was absurd to suppose that a farmer, however opulent he might be, would not take a pounds-shillings-and-pence view of the matter (Hear, hear); and that if his means were adequate he would have a fixed engine on every part of his farm. With all that had been said relative to the expediency of adopting fixed steam-power for threshing, he repeated he was satisfied that for his own purpose a portable engine was best (Hear, hear).

Mr. OAKLEY said he had had considerable experience with regard to portable engines. If he took 500 acres of land without any building upon it, he should unquestionably erect a fixed engine.

The Rev. Mr. DAY said he could hardly speak on this question as a practical man, his position being rather that of an observer in such matters. He was told the other day, by a friend, that he had lost himself by becoming a Protectionist (laughter). His defence was, that he had the welfare of the farmer at heart (Hear, hear); nothing else could have drawn him from his seclusion. As regarded this question, seeing that such a vast amount of labour was being abstracted from the country, they must find something to supply its place; and to what could they have recourse for that purpose except those machines which had been so well described that evening? (Hear, hear.) He was satisfied that the more machine-labour farmers employed in the cultivation of the soil—whether for the purpose of stimulating production or for the disposition of the products which they had obtained—the better would they be enabled to meet the competition to which they were now exposed. Much as he respected the talents and energy of his neighbours, he must say that there was a great deficiency of manual labour on the land which they occupied; and, at the same time, he felt that no possible addition to the manual labour would be so beneficial as recourse to mechanical aids (Hear, hear). If farmers wished to cultivate the land profitably, they must avail themselves of such aids very extensively; and he was convinced that in many cases it would be found advantageous to employ fixed rather than portable engines.

Mr. SIDNEY felt that, as regarded the comparative merits of the two kinds of engines, the meeting was in a somewhat similar position to the Knights of the Golden Shield—both parties being right. No doubt there were circumstances under which fixed engines would be found most useful, and other circumstances under which portable engines would be best. One objection to the erection of fixed engines was the uncertainty of tenure, of which so many farmers had now to complain. Unless landlords conceded something like settled tenure, it was impossible that their tenants could cultivate the land in the most profitable manner, whether by the aid of these or of other means of a similar character. In Northamptonshire, Colonel Cartwright con-

vened, the other day, a meeting of farmers, to make arrangements for a system of lending machinery to farmers. He (Mr. Sidney) could not pretend to say whether or not such a scheme was practicable, but it was certainly well worthy of attention. Colonel Cartwright had always been regarded as the farmer's friend, and it was remarkable that he had come forward to declare that the employment of machinery would do more for farmers than any legislative enactments. A permanent system of tenure was necessary to bring steam-engines into general use; and when that had been granted, English farmers, being placed in the same position as Scotch farmers, would no doubt employ fixed engines extensively in the cultivation of the land.

Mr. Woon had felt greatly interested in the whole of the discussion which, with the exception of the digression just made to the subject of tenure, had kept very closely to the point. It had appeared to him impossible to apply steam engines with advantage, in consequence of the number of tubes used, and their constant liability to get out of repair. He was glad to find, however, from what he had heard that evening that he was wrong, and that large engine manufacturers who had turned their attention to the subject had removed that objection. Of course, in dealing with a question of that nature, they must take into consideration the various positions of farmers, the differences between their respective farms and their powers of employing one kind of engine or the other. With regard to fixed engines, he believed that at present the steadings, except in cases in which the buildings had been erected recently, and upon modern plans, would seldom be found convenient for their employment. Wherever the homestead was conveniently situated and arranged, fixed engines, he thought, would be found most profitable; but, where the case was otherwise, he believed locomotives would prove preferable. In his own district the farms generally were of small dimensions, and, of course, in such cases the purchase even of a locomotive, much more of a fixed engine, was out of the question. He had himself a locomotive engine which, not having full employment for it himself, he let out among his neighbours, and perhaps by this means he would get enough to pay for it within a few years (laughter).

Mr. RANSOME, on being called upon by the Chairman to reply, observed that he was happy to say that he would not have to occupy their time by replying to any arguments brought forward against him, inasmuch as the general sentiments expressed by the meeting were almost parallel with those he had himself advanced, and with his general notions upon the subject. When he undertook at the outset to enter upon this discussion, he said that it was rather an unfavourable circumstance for him to be supposed, as an engineer, to be better acquainted with the construction of engines than those whom he was addressing; and while it was necessary for him, on the other hand, to obtain knowledge of the circumstances under which they would be required to be employed. No doubt there were circumstances under which fixed engines would be inapplicable, and in such cases, of course, the portable engine was that to which they must have recourse. With regard to the expense of fixing, in the case of the fixed engine he believed the outlay beyond the cost of the portable one would be fully counterbalanced by the subsequent expense for grease, oil, and other matters necessary to keep the portable engine in working order; and that, therefore, the advantage in favour of the latter was not in this respect so great as was generally supposed. No doubt in Manchester and in Leeds portable boilers were being introduced by the manufacturers. But there they had for a long time been working their engines at low pressure, and, wanting more steam, they were now trying the experiment of working them at high pressure. They must know more than he did if they thought the experiment would answer. If they attempted to put a large amount of power into a small compass, they would have to put up with the inconvenience which always followed from the attempt to cram large things into small ones. At present there could be no doubt that the advantage did lie with the Cornish boilers. There was another circumstance connected with the experiment which had been alluded to, which those whom he was addressing could not be expected to have the advantage of—namely, that where the tubular boilers were now used they were under the management of experienced hands. He concluded this discussion with the same expression as that with which he commenced it—that wherever the farm was so circumstanced that the homestead might be made the scene of the general operations, there the fixed engine would be most advantageous. No doubt there were many circumstances in which the portable engine would be highly useful, and the difficulty of introducing steam at all into farming operations was alleviated by the employment of an engine that was portable, and which was on that account liable to fewer objections arising from habit and otherwise than the fixed engine. In the end, however, it would be the same with steam engines as it had been with mills, thrashing machines, and all other mechanical improvements applicable to farming operations—that commencing upon the itinerant principle, that was, being carried from one farm to another for hire, the farmers at length became so convinced of their advantages, that, instead of hiring, they purchased them for themselves. He understood that it was usual for the person who introduced the discussion to frame a resolution to be submitted to the meeting. He should have preferred it if some other gentleman who spoke from the other side of the table had proposed the resolution. He would, however, submit words that would embody his own opinion on the subject, and likewise what he gathered to be the feeling of the meeting. He was much gratified in having had the opportunity of expressing his opinion on a subject in which he felt so much interest. He fully agreed with his friend on his right, that the time was coming when machinery would be generally introduced in agriculture: men were not made to do the work of asses (Hear, hear); and it was far better, by teaching our labourers the use of machinery, to increase their usefulness with their experience than to exhaust their power by straining their bones and sinews in early life, and to leave them in their old age a helpless burden on the country. The resolution he begged to submit was—

"That where the buildings are situated in a central position of the occupation, and where they are convenient for the purpose, fixed engines are preferable to portable ones; but this meeting is nevertheless of opinion that, in the present state of agriculture, the introduction of the portable engine has been, and will be for many years, a great advantage, inasmuch as it enables many persons to avail themselves of the advantage of steam who otherwise could not have the opportunity of raising steam in any other manner, but perhaps more especially from the fact of its being a means by which the use of steam may become more generally appreciated, and ultimately become generally adopted in its best form."

Mr. Nesbit proposed, and Mr. Wood seconded, a vote of thanks to Mr. Ransome, which, having passed, was briefly acknowledged by that gentleman. After the usual compliment to the Chairman, the meeting separated.

TENANT-RIGHT.

For many years past have the columns of this journal been open to the full discussion of a principle which appeared at the outset to demand, at least, very careful investigation. The result of the most satisfactory of all tests, time and experience, has shown that too much importance was not attached to the question thus considered; and that THE TENANT-FARMER'S ADVOCATE could not have been engaged upon a matter more directly bearing on the tenant-farmer's interest. If, too, the victory has not yet been decisive, it has at least been progressive. Land-owners and land-agents, who once looked on the tenant-right claim for unrequited improvement as an actual absurdity, now recognize it in their arrangements with those who hold under them. The Legislature, it is true, has afforded anything but that aid once asked of it. Happily, however, a cause based on justice, and conducive to the equal good of all concerned, can generally do much for itself. The English tenant-right has done this. In the face of opposition of the most determined character it has continued to advance; having, in fact, no greater impediment to meet than what ignorance or misrepresentation might be able to offer.

And yet these are not the most powerless of enemies. Beyond a doubt they *have* done much to retard the recognition of that simple act of justice which could scarcely, otherwise, have been denied us. Such influence, however, is now almost over. By keeping the discussion closely to what is really demanded, nearly all persons interested in the cultivation of land have come to see and admit the reasonable character of the claim made. Here still is our stronghold. Let the English tenant-right stand on its own merits; let it be a right to compensation for improvements the tenant has effected, but of which, circumstances have not returned him the fair advantage. Here we stop. Connect it, associate it with nothing else, and the principle is safe—and as sure yet to advance as it has advanced, in public opinion and adoption. It is only when confounding it with what *it is not* that we find objections difficult to answer. Then it becomes complicated in its nature; then it infringes on the rights of property—exhausts the in-comer's means—leads to fixity of tenure, and to other grave consequences—that, in simple truth, English tenant-right can never lead to at all.

We confess, then, that it is with some regret that we see a gentleman associating in one pamphlet the Irish rights, the fixity of tenure in fact, with our allowances for acts of improvement. No two claims should be kept more distinct, notwithstanding the unfortunate similarity of title. The more we come to comprehend the cry for Irish tenant-rights, the more convinced are we that we have no business with it here. We hope to continue to see it, as it has been, a prohibited word amongst English agriculturists.

As for Mr. Sharman Crawford's bill, the object appears to us as extravagant as the means for effecting it must be unwieldy and embarrassing. should it ever pass, the law courts of the sister isle will have a fine field for employment in carrying out its intentions—whatever they may exactly happen to be. It is but fair to say that the author of the pamphlet we allude to—himself an Irishman—most unhesitatingly condemns it. The measure introduced by the late Solicitor-General for Ireland, Mr. Napier, meets with more favour, however, simply from its being grounded on the English custom; while this—as embodied in and as so well known from Mr. Pusey's bill—is selected as the most practical of all.

Here is a compliment, undoubtedly, considering the quarter whence it emanates. Still, with all respect be it asked, is it one we require? The publication of Mr. Bullen's paper—"Modern Views on the Relations between Landlord and Tenant"—is something of a superfluity, if not of a mistake, on this side of the channel. To be effective—to really work some good—it should be disseminated amongst those who so much require the information it contains. Mr. Bullen must be fully aware that the path he traces out is here already a well-beaten one. The detail he furnishes respecting the English tenant-right, and the analysis he offers on Mr. Pusey's bill, have been made years back, and passed almost as long into general circulation. In

fairness to all be it said—to ourselves amongst others—that we cannot find an opinion or suggestion in these "Modern Views," but that has already been thoroughly canvassed—at least in Great Britain. From "Modern Views," then, the English landowner or occupier can learn little but what he is already well acquainted with from the columns of the *Mark Lane Express*; while, on the other hand, he will become more and more confused over the consideration of Irish rights and Irish remedies, that evidently weary Mr. Bullen himself to discuss.

We think it right, and even necessary, to speak thus plainly. We are confident that Mr. Bullen writes with the best intentions, but this is not the field for his labours—at least as here directed. Beyond the admission—which we candidly confess we have ever taken for granted—that the English claim is out of all comparison reasonable and preferable to the Irish, we have little to learn from "Modern Views." It is to the Irish themselves the pamphlet should be specially addressed. Let them gather from its pages the justice and moderation on which Mr. Pusey grounds his measure—the simple and thoroughly practicable manner in which he would have it carried out—and then let them reconsider what incompatible demands some of their countrymen are even now making for one class on the property of another; and by what a fearfully complicated and expensive process they would have these demands enforced. It is here "Modern Views" would be *modern*, and, as we should hope, impressive.

As regards any means for facilitating the more general adoption of the tenant's right to an allowance for his improvements, we must repeat that it will have in a great measure to work its own way. In England it has already done so. The more it is understood—the more it is found how such a system encourages and insures good farming—the more has it come into use. We have every authority for saying this. Mr. Bullen, with the elaborate machinery of his two countrymen before him, appears to have no great hopes in legislation. He would, however, have the principle at once admitted, and to this end he has drawn out a series of "declaratory resolutions," to which the landlords are to volunteer, and which are to result in the establishment of a kind of Tenant Right Commission. We are satisfied, from our experience of what the owners of the soil have already volunteered on the subject, that we cannot expect any very speedy realization of this scheme. *Non vi sed sæpe cadendo*, will they come to accord an act of justice embodying so much advantage to themselves; while "endless discussion," after all, must be the chief means of making an opening in their hearts.

FARMERS' POLITICS IN THE NEW WORLD.

In the United States and our own Canadian colonies very strong efforts have been making, for some time past, to improve the science and practice of agriculture in each of its four great departments of animals, vegetables, manures, and machinery. In the *Mark Lane Express*, of the 23rd ult., an instance of the former is judiciously pointed out by Mr. Forsbury, in his letter "To the Landlords and Graziers of England," while two examples of greater magnitude appear in the last week's publication. In accordance with these—which induce us to return to the subject—we have just received a letter from Canada West, where, the writer states, "There appears to be a great stir among the old settlers just now, improving their breeds of cattle. The Durham is the thing sought for; and some are paying long prices for bull calves, but they have still the Canada cow. The Leicester sheep is the fashion, but in the same state with cattle—not pure." In short, in British America and the Union, all is activity and bustle, to beat the mother-country "at farming."

In our Canadian colonies there cannot be a doubt but that the progress of railway and steam communication, coupled with the reception which their products met with at the Great Exhibition of 1851, in Hyde Park, has greatly conduced to awaken and stimulate a spirit of enterprise in every department of industry, especially agriculture. Few left the Canadian department of the Crystal Palace without being deeply impressed with the value of her natural products, especially when compared with those of the mother country; and if such was the effect produced upon the minds of the English farmer and the capitalist, what must have been the impression upon the old Canadian settler, in passing through the avenues in which lay piled the products of "British industry?" Could he have left them without appreciating the incalculable value of chemical and mechanical science in connection with agriculture and every other art, and the many advantages which the English farmer possessed over him?

It is, however, principally to railway and steamboat communication that Canadian agriculture is indebted for the rapid advances she is now making in every department of science; for these are fast removing the many barriers which previously existed between her and the mother country, as well as every other source of information: on the one hand, affording her many facilities for acquiring a thorough knowledge of all the improvements

now taking place among our own farmers, as well as for importing our best breeds of live stock, seeds, implements, and artificial manures; while, on the other hand, the character and means of the emigrants are vastly more in favour of her intelligence and prosperity, owing to the progress of education at home and the growth of society in her own provinces, inducing small capitalists to emigrate. There have been many erroneous notions entertained in this country relative to land, its political economy, and management; and it is not to be wondered at that those, when introduced into our colonies, should maintain their original character, forming strong barriers to farmers in the march of improvement.

It is difficult to say what Canadian farmers have suffered from slovenly following the antiquated practices of the mother country, or what they may gain from those scientific systems they are now so eagerly cultivating. Hitherto manure has not unfrequently been "deposited upon the ice in place of the land, and there left to float off in spring, or else allowed to accumulate year after year, until it becomes necessary to erect new stables to abate the nuisance," according to their own official testimony; while the productiveness of the soil has been reduced from thirty bushels of wheat to ten by injudicious cropping; and oxen, sheep, and swine have degenerated below profitable rearing. Yet even under such a system—if system it can be called—Canada, in 1849, with a population less than that of the British metropolis, exported agricultural produce to the value of £821,608 5s. 11d., of which England received to the value of £326,510 8s. 4d. Such being the exports under the practice just noticed, what may it not be under an improved one, capable of returning double and treble produce, and that too at less expense?

The agriculture of the Union has been less affected by external influence than that of Canada, and more from internal energy—owing, no doubt, to the difference of the political relation between them and the mother country, coupled with the growth of their respective populations, the tide of emigration rolling principally into the boundless prairies of the former. Some of the older states, as New York, for instance, are densely populated, compared with Canada, and have proved an example to the other states where the growth of society and civilization has been less. Hundreds of thousands of emigrants have left the mother country with no other idea of destination than to get to New York—once there, they would work their way into the interior as Providence might direct their steps. Hence labour, an article of no small value in America, was more plentiful in that State than in the others, creating a larger consumption and better markets—circumstances of the highest importance to its agriculture, as they afforded the means of reclaiming its soil and saving a little independence. Many of the early settlers in this State, although landing poor, acquired capital sufficient to enable them to purchase estates for their families.

But while an abundance of labour aided the progress of agriculture in this, and other old States similarly situated, it was the means of sooner exhausting their soils, owing to the scourging system followed bringing their farmers, as it were, to a stand-still—a fact which has lowered them in the estimation of emigrants for nearly the last half century. "Human toil is often praised for being highly *productive*," says Dr. Lee, an American writer, alluding to the question at issue, "when, had the whole truth been known, it would have been seen to be remarkably *destructive*," as the counties of New York have experienced; for the exhaustion of their soils have not only lowered them in the estimation of emigrants, but of their own old settlers, many of whom sold out as soon as they could find a purchaser, betaking themselves to the bush husbandry of the interior, beginning the world afresh as they or their forefathers did.

Those changes of the primitive settlers, however, have proved to be of the highest importance to the progress of agricultural science, because many of their successors were men of considerable capital, acquainted with ameliorating systems of husbandry, and who, consequently, exemplified to the farmers around them that the natural fertility of the soil could be profitably restored by the economy and judicious application of manure.

It is of recent date that improved systems have been cultivated in the mother country; for prior to the commencement of the present century little was known to the bulk of emigrants but the opposite; and even at the present day what does the half of emigrants know of scientific agriculture? Hence, it would have been unreasonable to have expected any other practice from them but the old one, especially considering the altered circumstances in which they were placed relative to the natural fertility of soils, climate, and absence of rent and taxes, comparatively speaking, on the one hand, and dear labour and cheap produce on the other, coupled with the expense of marketing.

An imperfect knowledge of the political economy of and has been very severely felt on both sides of the Atlantic; for in the mother country "Farmers' Politics," until recently, were very unfashionable; while in America they were in the opposite extreme, by far too much importance being attached to them, as if they alone could make corn grow. In the former, farmers, prior to emigration, had felt the heavy burden of rent and taxes, with the powerful influence of the landlord; consequently, when rid of these in the latter, they had too hurriedly arrived at the conclusion that all would be right, forgetting that "Property has its duties as well as its rights." But of late both parties have begun to take a more comprehensive and favourable view of things, recognising the golden mean between their former extremes. The prejudices of the American farmer against the theory of the English landlord-system, for instance, are beginning to subside; for he now sees that the landlord's duties, if properly discharged, are of the highest value, and that the reverse is subversive of the best interests of agriculture. He not only sees, but feels, the force of this conclusion, in the exhaustion of his own arable soil, imposing upon him the necessity of cultivating its permanent improvement and fertility—a proposition involving the duties of the English landlord, not those of the English tenant; and he not only feels that the duties of the English tenant have been in many cases

badly performed, but that those of the English landlord have been still worse, and that before a more profitable system could be pursued, the interference of Congress was necessary to investigate the rights of the public and all parties involved in the enhaustion of the American soil—a question embracing the statistics of agriculture.

In a country where agriculture is carried out by landed proprietors and labourers only, the rights of the tenant are of course excluded. For under such circumstances Political Economy has only to investigate the rights of the public, the proprietor, and the labourer.

But, although the landlord-and-tenant system is not the rule in the United States and Canada, and not only not the rule, but a system still repudiated, yet, with all their antipathy to it—an antipathy which knows no bounds, generally speaking—it forms the exception! and that, too, which is daily gaining favour among emigrants of small capital, and labourers who settle and acquire the same, especially in Canada; for the letter from that colony, already quoted, says: "In my opinion, a cleared farm is the best, for you have a comfortable living at once; while, on a bush farm, you are years before you can send anything to market, and have many hardships to endure all the while. We have two neighbours who sit each on a rented farm, and both are doing well. Rent 6s. per acre, English money—we would call it a dollar and a-half—the current price all round here, with very short leases; six years being the common thing, but sometimes less." From different sources on both sides of the St. Laurence, including the United States, we have similar information; so that in our colonies of the northern hemisphere we unexpectedly arrive at the obvious conclusion, that LANDLORDS ARE SCARCE; and hence, according to the well-known laws of supply and demand in the labour market, are remunerated accordingly, receiving from 7½ to 12½ per cent. for their money, and, in some instances, more, or upwards of double of what they are receiving in the mother country; and the same may be said of our colonies of the southern hemisphere.

The inference deducible from the above observations is this, that American farmers are beginning to appreciate experimentally the benefits to be derived from the organization and subdivision of labour—a subject of no less importance in connexion with agriculture than any of the other arts, though economists have too often arrived at the opposite conclusion; and therefore the more it is understood in theory the more general will the practice of renting land by emigrants of small capital become. We are not, however, to be understood to infer that American tenants have not an ultimate eye to the purchase of land themselves as soon as they have acquired a sufficiency of capital to do so, so as to be able to bring more effective machinery to bear upon the forest than that in common use. Before we could arrive at such a conclusion, a change in human nature would be absolutely necessary, so prone is the mind of man to the possession of land. It is the accumulation of capital on the one hand, and the want of it on the other, coupled with its inestimable value in both cases, which gives rise to the landlord-and-tenant theory. For instance, had tenants and labourers in the mother country a sufficiency of capital, they would all be landlords together, and hence tenants would just be as scarce as are landlords in her colonies—using the word landlord in its twofold meaning, as currently used in both. It is the want of capital which gives rise to tenants and labourers in a colony.

The rights of the public, we have said, embrace agricultural statistics—a subject on which the American farmers and Congress appear more united than the English, and one in which they place more importance, obviously because they take a more sound, comprehensive, and practical view of it, attributing even the exhaustion of their soil to the want of the necessary statistical information; for, say they—quoting official authority, the Report of the Commissioner of Patents—"Good and bad farming are now so blended, that delinquents escape nearly all exposure; while such as do well, are denied that distinction which is the just reward of merit. There is no resisting a legitimate argument, sustained by conceded facts. Mistakes in practice, and errors in theory, must give way before the light of truth: and the truth alone should be diligently sought and widely disseminated among the farmers of the Republic." In short, it is not merely the number of acres and the amount of produce which comprise American statistics—for they include *the number of good and bad farmers* also. For example:

Of the 12,000,000 acres of improved land in the State of New York, 1,000,000 are so cultivated as to become richer from year to year—being in the hands of 40,000 farmers who read agricultural journals, and nobly sustain the state and county societies of that commonwealth. 3,000,000 barely sustain their fertility, and are cultivated by a class of farmers who *read not*, but do their best to follow the practice of the last. 8,000,000 acres are in the hands of 300,000 cultivators who follow the old practice of exhausting the soil, which has fallen from 30 to 5 bushels of wheat per acre—Albany county, in 1845, producing only 7½ bushels per acre; Duchess county, 5; Columbia, 6; Reusselaer, 8; West Chester, 7; &c.; while Albany, in 1775, produced from 20 to 40. The 300,000 persons that cultivated those 8,000,000 acres produce each annually 25 dollars less than they would have done had the land not been exhausted. There is no escape from this oppressive tax of 7,500,000 dollars, but either to improve the land at an expenditure of 100,000,000 dollars, or run off and leave it. It is calculated that Maryland, Virginia, North and South Carolina, and Georgia have lost the equivalent of 500,000,000 dollars by exhaustion of land.

It is not merely statistics generally as above, but individually as follows: "There are samples of wool in the Patent Office, the product of a sheep that yields 18lbs. of washed wool a year, and weighs 420lbs. This mammoth sheep is the property of Colonel Josiah W. Ware, of Clarke County, Virginia, whose best fat wethers sell at 35 dollars a head." Other examples are given where flocks which once yielded 5lbs. per fleece have now fallen to 2lbs., &c. The great Washington's fell from 5 to 2½lbs. during his wars.

The rights of the public, however, involve more than statistics; for if the soil has been exhausted, it has a right to know the cause and remedy, as well as the

amount of exhaustion : but, while it obviously enjoys this privilege, it has also its duties to perform towards the farmer. Hence for the last eight or ten years the American Government has been collecting all the information which the improvement of its agriculture demands, not only from individuals of the greatest talent in its own provinces, but from all corners of the world, through the instrumentality of its Patent Office, which collates and arranges the whole in the shape of an annual report of some six hundred octavo pages, for circulation among farmers, who have fully appreciated its value with gratitude ; for the effect produced is far beyond the most sanguine expectation previously entertained from official information of this kind. From time immemorial the American farmers have enjoyed the benefits of state and county societies—cattle, implement, and produce shows—with ploughing matches, and suchlike machinery, the same as English farmers have done—besides companies for the importation of English cattle. But such was found insufficient, never having produced in half a century the effect which the Patent Office has done in one season ; because through it the progress of chemical and mechanical science is brought to bear upon the different branches of agriculture with a different force and a different interest to the farmer.

The Union has justly been termed "*a nation of farmers*," farmers forming "a large majority of the voters," so that they have themselves to blame if their interests are neglected, either in Congress or State Legislatures. Hence, however they may have hitherto under-estimated the advice of Washington, who was himself a farmer, and strongly advocated the cultivation of agricultural science, they have now caught the true spirit of their great president, and are exerting every nerve to reduce it to practice without fear of opposition, and the progress they are making is only equalled by the magnitude of the work before them. Complaints are no doubt yet many, but no sooner established than the necessary steps are taken to have them redressed. The rights of American labourers have hitherto been sadly neglected ; for half their number are slaves, while the domestic happiness of the other half has been little cared for ! The plight of the poor emigrant, who has hitherto arrived in the Union with an empty pocket, was sober indeed. In this country our large manufacturers —a class ever alive to their own interest—are beginning to descry a short supply in the labour market. Hence cottages and gardens for their operatives are fast being built, and every other prudent means used which the circumstances of the case demand ; but in America, although labour has been scarce, no such effort has been made to induce the surplus rustics of our overflowing provinces to emigrate ; for to them the threshold of colonial life has been truly purgatorial : indeed, such was its barbarous character, that few penniless labourers, however indifferent they might be to civilized life, ventured to cross the Atlantic unless they had either a friend or relative before them. Happily, however, the American Patent Office has at length succeeded in removing the farmers' candle from under the bushel. Chemical and mechanical science, involving the proper application of labour to the soil, is now becoming better understood, so that the domestic comforts of the labourer are beginning to be cultivated. Hence the stimulus which it has given to the "exodus" at home.

Such are a few desultory observations on the means now being used by the Americans to improve their agriculture. In the language of the Patent Office Report, "To compete with Englishmen in feeding people at their own doors, while Americans have to transport their breadstuffs and provisions from 3,000 to 4,000 miles to reach the consumer, is obviously a hard business for our farmers." It is one, however, which the American is strenuously and successfully pursuing; and let us, therefore, not be found sleeping at our posts in the conflict, since we cannot avoid joining issue in it.

MEETING OF THE WEST OF ENGLAND AGRICULTURAL SOCIETY AT PLYMOUTH.

The West of England Agricultural Society—with Bath for the centre, or rather capital of its territory —lays claim to being the oldest association of the kind we have. It has now been established upwards of seventy years. Like many other public institutions, and those connected with the interests of agriculture perhaps more especially, its career during this long period has been anything but one of uninterrupted success. For many years, indeed, it appears to have had scarcely more than a nominal existence; and it is certainly but within a very brief space that the society has aimed at anything like that prominence which it at present enjoys. Its resuscitation would seem to have been suggested by, and its advance set about with the Royal Agricultural Society of England as the model for its future conduct. Like that eminent body, the West of England has determined on holding summer meetings, selected year by year, for different towns within the limit of its operations; while, coupled with this new feature, it has associated another, which, although but a revival, evidently traces its re-appearance to the same high authority. This is the publication of a Journal or annual record of the proceedings of the society.

The first of these locomotive meetings was held about this time last year at Taunton; and the first number of the Journal—new series, as we should properly write it—was published this spring.

The Taunton Meeting, we are told, was in almost every respect a most encouraging commencement.

It had the fervent support of nearly all the best of men of all classes in any way identified with the agriculture of the "west countree." Lord Portman, Mr. Miles, and, above all, Mr. Ackland—gentlemen already experienced in the management of such meetings—were foremost in the direction; while they declare themselves to have been well satisfied with the spirit in which their labours were met and appreciated by those for whose benefit they were intended.

So far for the first Meeting. Of the first "Journal" we shall hardly speak so highly. We cannot help considering it rather a mistake. It is a bulky tome, approaching in size to something like an average number of the Royal Agricultural Society's work. For a district report—as the representative of a body assuming only to certain local rank and administration, it might at the first glance be thought somewhat difficult to fill up so many pages with matter legitimate to its object. Any such impediment has, however, in this instance been very easily overcome, if not, perhaps, with too great an observance of what would really be in character with its title. More than half the space in this first number is occupied with the consideration of subjects that have quite as much reference to any other part of the kingdom as they have to the west. This, moreover, is chiefly reprint—the Hanover-square "Journal" over again. The borrowed matter is undoubtedly well selected, but, as we must repeat, with little regard as to its applicability. We should wish to see every local society of any character furnishing reports for the use of its members; but the real value of such papers —at least as we take it—must mainly rest on their being addressed to topics which fairly come within the scope of the body they emanate from. There are several such papers in the number we refer to —those, for example, connected with and reporting on the exhibition of implements and show of cattle at the Taunton Meeting. The latter of these is rendered particularly interesting, valuable, and appropriate, from the well-digested observations on the different varieties of Devon cattle. Here, and so far as, we must in justice add, on similar matters bearing closely on its object, the "West of England Journal" becomes the useful authority we should expect to see it. In the height of its ambition, the society has gone something beyond this. It was a pardonable vanity, at the worst; but it strikes us that it must have been attended with an expense in the way of printing, and so forth, that an association just feeling its way on new ground would, we should have imagined, be scarcely warranted in incurring. We write with the best wishes for the society and its representative; and in doing so, we cannot help saying that we consider the latter would be far more in character were it somewhat reduced in size, and its papers confined—for the most part, at least—to local matters, supplied by local authorities.

The West of England Society has, in fact, no need to deal in second-hand stories. As a local institution, we believe it to be already the first of its kind; at least, we know none at which the meetings have been supported, either by exhibitors or attendance, with more spirit, or in which the results have tended more to what was desired. If the promoters of the undertaking were satisfied with what they accomplished at Taunton, they have yet more reason to congratulate themselves on the advance they have made within only one year of that meeting. It was, indeed, difficult to consider the agricultural gathering which took place on Wednesday and Thursday last at Plymouth, as merely a local one—however large the extent known to be embraced within its range. Still the main features of the show-yard were quite in character with the fame of that district in which the festival—for such was it, in fact—was celebrated. The pure thorough-bred Devon, for example, was the chief attraction among the animals; and though the display was not numerically so large as some of us might have expected to see, it had the counter advantage of exhibiting very few animals of an inferior sort. We should have preferred, perhaps, to have found a few more of their neighbours disputing the lead with Messrs. Quartley and Turner. The most dangerous opponents, however, of these renowned breeders have had further to travel, and, as will be seen by the prize list, it was again as at Lewes last year, Devon against Somerset. The latter had quite their share of the honours, and in the cows and heifers were especially strong: this, too, where almost all the entries were good; the yearling heifers in pairs, amongst others, being all entitled to commendation, and rendering, we should say, the award a matter of some difficulty. Of course, where every one you met was qualified more or less as a judge, the different decrees were warmly canvassed; but the whole of these classes furnished of themselves a fine elucidation of that still vexed question, "What is a Devon?"—whether you went to the neat, perfect beast Mr. Quartley has made himself famous for, or the more fully-developed frame the men of Somerset have encouraged, and have been encouraged in.

In close order, unfortunately with the North Devons, stood the South Devons, or South Hams. They have this year been treated as a distinct variety, which their appearance at once proclaims them to be. Higher and coarser than the North Devons, they have at least the recommendation of size in their favour; and some of them looked well and even to the eye. The number of entries, however, did not show much cause for the continuance of separate premiums for a class of stock whose admirers are evidently but

limited, and which, to use a common phrase, "don't do after the others."

The prizes for cattle "of any other pure breed" were contested by one breed only—the Shorthorn—the show of which was remarkably good. Mr. Stratton, of Swindon, it will be noticed, again took the chief prizes—with a bull that won in another class at Taunton; where his best cow of this present show was also successful. Though this eminent breeder was of course too much in a neighbourhood for which such kind of stock has not yet been noted, the admirers of them must be well content with the progress the Durhams are now making in the West. We did not see a Hereford in the yard.

Of the sheep, the Southdowns scarcely reached average merit. The Dorsets, on the other hand, we should say, furnished about the best collection of this kind of sheep ever brought together. The ewes, in pens of five each, were as remarkable for the number as the excellence of the entry, and, as a class, commanded the expressed approbation of the Judges. There are certain districts within the range of the West of England Society, where this breed is now particularly sought after, and for which very high prices are given. They comprised a very strong point in a local show. Of the Long-wools, or Devon-Leicesters, there was also a very excellent muster; while the Mountain sheep sadly disappointed us. Mr. Quartley certainly won his prize for ewes with every credit, but we wanted a far more general introduction to the sort.

In the pigs the attraction was mainly centred in the smaller breed, Devon having of late become some what celebrated for the success with which she has transplanted "the improved Essex." They were well represented here by Mr. Moon, Mr. James, and others, while their merits were as ably disputed by what is called the "Leicester" pig; also of a black colour, but scarcely so finely bred for the eye as the Essex, or Fisher Hobbs'. The Leicesters, however, had all the best of the meeting, winning four premiums out of the five offered.

A grey Cleveland brood mare, a very clever one, with a well-bred blood stallion, Repletion by Venison, and one or two good entries in the extra stock, were all we could find amongst the horses. We certainly, from our own experience as here gathered, cannot agree with Sir Harry Smith, who at the dinner took particular occasion to compliment the Devon farmers on their breed of cart-horses. They really ought to be very much obliged to him.

Following a fashion that has, after all, much to recommend it, the West of England Agricultural Society has united an exhibition of poultry with their show of stock and implements. A few birds were sent to Taunton, but on this occasion the fowl was made a far more prominent point in the attractions of the week. This, though, was attended with one very serious objection, which we would advise the Council at once to remedy. Though appearing in the programme, and naturally enough concluded to be, as it should be, part and parcel of the agricultural show, the public were made to pay a separate admission charge for visiting it—that is to say, you paid half-a-crown in the first place to see the cattle and implements, and then another halfcrown to see the poultry. We may be told that this is a distinct and separate speculation, in no way connected with the Agricultural Society. We cannot for a moment admit it to be so. We believe "The West of England" countenanced, and in some measure provided the funds for starting such an exhibition, and that they will take the profits arising from it. If, then, these shows are to be held at the same time and place, "the West" must follow again the example of the Royal Agricultural, the Birmingham, and other similar associations, and make them *one*—under one general management, in one show-yard, and at one price. It has been asserted that the tenant-farmer has not yet taken sufficient interest in the breeding and rearing of poultry; but surely this is not the way to get his attention to it. We are certain there were many such, who, satisfied with one outlay, never saw the Cochins or Dorkings at all.

We should wish to be understood that we make this objection not merely on our own private opinion, but from a very general expression of dissatisfaction. Many people like to stroll from one department to another; but extraordinary care was taken that no one passed from the poultry to the cattle yard, or *vice versâ*, without paying the admission charge every time he did so. It will be impolitic and unhandsome to continue the levy of these double dues.

The pens of poultry, moreover, would have added to the appearance of the main show-ground, which, as it was, hardly looked furnished. Still, this gave ample room for the best arrangement; and the exhibition of implements never had more scope or opportunity for a display of the many inventions submitted for inspection. The Council of the Society depend a great deal on this department, and classify their prize-lists with an especial regard to the wants of those small occupiers with whom the country abounds. Their intentions were well backed by many eminent makers; some of whom came from long distances, supplied with specimens of their most celebrated machinery. Messrs. Hornsby, from Grantham; Busby, from Bedale; Coleman, from Chelmsford; Howard, from Bedford; Dray and Co., Burgess, and James, from London; Holmes, from Norwich; Barrett and Exall, from Reading; Smith and Ashby, from Stamford; Samuelson, from Banbury; Stanley, from Peterborough—supported by a great number of more local firms from Bristol, Ply-

mouth, and other neighbouring towns. Mr. Hussey attended—for the first time we believe in person—to superintend the direction of his reaping-machine; and either this or McCormick's were allowed, on trial, to have never worked so well. Both machines have been greatly improved.

The manufacturers generally expressed themselves as much pleased with the accommodation afforded them; and, as one of the public, we can add our best word of approval to theirs. In the disposition of the cattle, matters were not so well managed; and as the inconvenience here arose from a mistake easily remedied for the future, we the more readily call attention to it. Instead of having the numbers with the prizes—if any—at the heads of the animals exhibited, as they are at most other meetings, and where the spectator may "run and read" with every facility to himself and his friends, the managing committee of the Plymouth Show did it in this wise:—they carefully concealed the number at the foot of the beast, and just within the roof of the shed he stood in. Anyone, consequently, desirous of knowing what an animal was, had to enter the stall, and then turn about in search of the guiding-number. Anything more inconvenient in a crowd than this perpetually twisting in and out, can scarcely be imagined. The wonder to us is, how such a plan could ever have been adopted. Fortunately, highly bred and fed cattle are not taught to kick, or many a broken limb must have followed in the attempted gratification of a laudable curiosity.

The other arrangements, both in the grounds and at the dinner on the Thursday, were generally good. The inhabitants of the town or towns of Plymouth and Devonport, indeed, welcomed their visitors with all kinds of amusement and ornament. Flower-shows, triumphal arches, and transplanted trees in the streets, military bands on very active service, excursion parties—everything, alas! but the weather, was propitious. It was the same, we are told, at Taunton last year; the same gay preparations all clouded by the same damping influence. The West, though, despite wind or weather, has been famed ere this for the spirit with which it engages on the festivals of Ceres. The gala-week at Exeter will long live in the records of the Royal Agricultural Society.

The dinner took place on the Thursday, under the presidency of Sir Thomas Dyke Ackland, supported by Sir Harry Smith, with many other officers of both services, the municipal authorities, and some hundreds of country gentlemen and practical agriculturists, from Devon, Cornwall, and Somerset. The toast-list, running to great length, was almost altogether of a complimentary character; while the addresses bore so little on the proceedings of the meeting, that we refrain from giving them in a journal not specially devoted to the district.

It would be unfair to conclude this notice without some mention of the liberality and attention displayed by the Great Western, and the other Railway Companies, in the conveyance of stock and to the convenience of visitors. Despite a very busy week, with heavy calls on their establishments from Oxford and Ascot, they ably fulfilled their promises to the Plymouth authorities. And these promises were of the best, too. Excursion-trains, double journeys at single fares, the free carriage of animals and implements for the show, must all have tended much to the *eclât* of a meeting the success of which was, indeed, beyond a doubt.

AWARDS FOR CATTLE AND IMPLEMENTS.

JUDGES.—Implements: Mr. MALDER, Alvis Cote, Gloucestershire; Mr. GRAY, King Weston, Somerset; Mr. MORLE, Carmington Park, Bridgewater, Somerset; Mr. EDMONDS, Abingdon, Berkshire. Devons and Long-woolled Sheep: Mr. BOND, Oak Farm, Taunton, Somerset; Mr. FREMAINS, Newlyn, Cornwall; Mr. WHIPPLE, Brenton, Devon; Mr. E. POPE, Maiden Newton, Somerset. Other Cattle, Sheep, Horses, and Pigs: Mr. BIRD, Newton St. Leo, Bath, Somerset; Mr. PAGE, Compton Pauncefoot, Somerset; Mr. BURGESS, Launceston, Blandford, Dorset.

CATTLE.

DEVON.

CLASS 1.—For the best bull, above two and not exceeding four years old on 1st September last: 1st prize, 12*l.*, to R. Jackman, Launceston; 2nd, 5*l.*, to R. Wright, Taunton.

CLASS 2.—For the best bull, not exceeding two years old on 1st September last: 1st prize, 12*l.*, to George Turner, Exeter; 2nd, 5*l.*, to John Quartley, Molland; highly commended, S. Farthing, Bridgwater; commended, 72, Fouracre, Durston.

CLASS 3.—For the best bull, not exceeding twelve months old on 1st September last, 1st prize, 5*l.*, to J. Tucker, Taunton; 2nd, 3*l.* to S. Farthing, Bridgwater; highly commended, J. W. Buller, Crediton; commended, George Turner, Exeter.

CLASS 4.—For the best cow in calf, or in milk, having had a calf within six months next preceding the day of the show, 1st prize, 10*l.*, to S. Farthing, Stowe; 2nd, 5*l.*, to Wm. Gibbs, Bishop's Lydiard; highly commended, J. Tucker, Staplegrove.

CLASS 5.—For the best heifer, in milk or in calf, above two and not exceeding three years old on the day of exhibition, 1st prize, 10*l.*, to W. M. Gibbs, Bishop's Lydiard; 2nd, 5*l.*, to George Turner, Exeter; commended, James Hole, Dunster.

CLASS 6.—For the best pair of heifers, not exceeding twelve months old on the 1st September last, belonging to the same owner, 1st prize, 5*l.*, to James Hole, Dunster; highly commended, James Quartley, Molland.

SOUTH DEVONS OR SOUTH HAMS.

CLASS 7.—For the best bull, above two and not exceeding four years old on 1st September last, 1st prize, 8*l.*, to P. Loye, Stokenham; 2nd, 4*l.*, J. Cockram, Brixton.

CLASS 8.—For the best bull, not exceeding two years old on 1st September last, 1st prize, 8*l.*, to H. Huxham, Slapton; 2nd, 4*l.*, to P. M. Toms, Coyton.

CLASS 9.—For the best cow in calf, or in milk, having had a calf within six months next preceding the day of the show, 1st prize, 8*l.*, to T. Newman, Mamhead; 2nd, 4*l.*, to T. Butland, Diptford.

CLASS 10.—For the best heifer, in milk or in calf, above

two and not exceeding three years old on the day of exhibition, 1st prize, 8*l.*—no merit.

CLASS 11.—For the best pair of heifers, not exceeding twelve months old on the 1st September last, belonging to the same owner, 1st prize, 2*l.*—no merit.

CATTLE OF ANY OTHER PURE BREED.

Class 12.—For the best bull, above two and not exceeding four years old on 1st September last, 1st prize, 12*l.*, to R. Stratton, Swindon; 2nd, 5*l.*, to W. Hitchman, Long Ashton.

Class 13.—For the best Bull, not exceeding two years old on 1st September last, 1st prize, 12*l.* to C. H. Abbott, Long Ashton; 2nd, 5*l.* to Hon. P. P. Bouverie, Hannington.

Class 14.—For the best bull, not exceeding twelve months old on 1st September last, 1st prize, 5*l.*, to J. Tyacke, jun., Falmouth; 2nd, 3*l.*, to Wm. Hitchman, Long Ashton.

Class 15.—For the best cow in calf or in milk, having had a calf within six months preceding the day of exhibition, 1st prize, 10*l.*, to R. Stratton, Swindon; 2nd, 5*l.*, to Rev. J. Vane, Bristol.

Class 16.—For the best heifer, in milk or calf, above two and not exceeding three years old on the day of exhibition, 1st prize, 10*l.*, to R. Stratton, Swindon; 2nd, 5*l.*, ditto.

Class 17.—For the best pair of heifers, not exceeding twelve months old on 1st September last, belonging to the same owner, 1st prize, 5*l.*, to R. Stratton, Swindon.

SHEEP.

LONG WOOLLED.

Class 18.—For the best yearling ram, 1st prize, 5*l.*, to S. Kingdon, Collumpton; 2nd, 3*l.*, to J. Moon, Crediton.

Class 19.—For the best ram of any other age, 1st prize, 5*l.*, to J. Bodley, Pomeroy; 2nd, 3*l.*, to S. Partridge, Crediton.

Class 20.—For the best pen of five ewes, of the same flock, 1st prize, 5*l.*, to J. Moon, Crediton; 2nd, 3*l.*, to J. W. Buller, Crediton.

Class 21.—For the best pen of five two-teeth ewes, 1st prize, 5*l.*, to J. W. Buller, Crediton; 2nd, 3*l.*, to J. Moon, Crediton.

Class 22.—For the best yearling ram of the pure Leicestershire breed, 1st prize, 5*l.*, to J. W. Buller, Crediton; 2nd, 3*l.*, to J. Moon, Crediton.

SOUTHDOWNS.

Class 23.—For the best yearling ram, 1st prize, 5*l.*, to J. Moore, Pewsey; 2nd, 3*l.*, to Sir J. Kennaway, Bart., Ottery St. Mary.

Class 24.—For the best ram of any other age, 1st prize, 5*l.*, to J. Moore, Pewsey; 2nd, 3*l.*, to Sir J. Kennaway, Bart., Ottery St. Mary; commended, John Moore, Pewsey.

Class 25.—For the best pen of five ewes, of the same flock, 1st prize, 5*l.*, to J. Moore, Pewsey; 2nd, 3*l.* (no 2nd prize).

Class 26.—For the best pen of five two-teeth ewes, 1st prize, 5*l.*, to Sir J. Kennaway, Bart., Ottery St. Mary; 2nd, 3*l.*, to T. Newman, Mamhead.

DORSETS.

CLASS 27.—For the best yearling ram, 1st prize, 5*l.*, to T. Danger, Bridgwater; 2nd, 3*l.*, to D. W. Gibbs, Wellington.

CLASS 28.—For the best ram of any other age, 1st prize, 5*l.*, to T. Danger, Bridgwater; 2nd, 3*l.*, to T. Danger, Bridgwater.

CLASS 29.—For the best pen of five ewes, of the same flock, 1st prize, 5*l.*, to G. Coombe, Creech St. Michael; 2nd, 3*l.*, to J. Culverwell, North Petherwin.

CLASS 30.—For the best pen of five two-teeth ewes, 1st prize, 5*l.*, to T. Danger; 2nd, 3*l.*, to G. Coombe, Creech St. Michael.

(The whole class highly commended).

MOUNTAIN SHEEP.

CLASS 31.—For the best ram of any age, 4*l.* No competition.

CLASS 32.—For the best pen of five ewes, of any age, 4*l.*, to J. Quartley, Molland; 2nd, J. Quartley, Molland.

PIGS.

LARGE BREED.

CLASS 33.—For the best boar, not exceeding three years old, 4*l.*, to H. Blandford, Chippenham; 2nd, no competition

CLASS 34.—For the best breeding sow, 4*l.*, to H. Blandford, Chippenham; 2nd, 2*l.*, to Rev. C. T. James, Ermington.

CLASS 35.—For the best pen of three breeding sows, not exceeding eight months of age, 2*l.* No entry.

SMALL BREED.

CLASS 36.—For the best boar, not exceeding three years old, 4*l.*, to W. Northey, Lake Lifton; (commended), J. Radmore, Thorverton.

CLASS 37.—For the best breeding sow, 4*l.*, to W. Dogherty, Landrake; 2nd, 2*l.*, to W. Northey, Launceston.

CLASS 38.—For the best pen of three breeding sows, not exceeding eight months of age, 2*l.*, to J. Moon, Crediton; 2nd, 1*l.*, to W. Northey, Launceston.

HORSES.

CLASS 39.—For the best stallion, for agricultural purposes, not exceeding six years old, 10*l.*, to H. D. Seymour, M.P., Wincanton; 2nd, 5*l.*, to T. K. Bickell, Tavistock; commended, E. Brooking, Plymouth.

CLASS 40.—For the best mare in foal, or with a foal by her side, 10*l.*, to R. Forrester, Tavistock; 2nd, 5*l.*, to J. and W. Perry, Oakhampton.

CLASS 41.—For the best thorough-bred stallion, suited for country purposes, which shall have regularly served half-bred mares in the district of the Society during the Season 1853, or shall do so in the Season 1854, at a sum not exceeding Two Guineas, 15*l.*, to T. K. Bickell, Tavistock.

EXTRA.

SHORT HORN HEIFER.—Wm. Elliott, Landulph—highly commended.

IMPLEMENT AWARDS.

SECTION 1.—PREPARATION OF GROUND.

For the best plough, for deep ploughing, 3*l.*, J. Eddy, Kenford. For the best plough, for general purposes, 3*l.*, Howard and Co., Bedford; ditto, highly commended, Wm. Busby, Bedale. For the best paring plough, to be worked by two horses, 3*l.*, J. Vanstone, Buckland Filleigh. For the best subsoil plough, to be worked by not exceeding three horses, invented by Dray and Co., London; ditto, commended, Howard and Co., Bedford. For the best turnwrest plough, 3*l.*, John Eddy, Kenford. For the best heavy harrow, 2*l.*, Howard and Co., Bedford. For the best light harrow, 2*l.*, Howard and Co. For the best cultivator, grubber, and scarifier (wide), 3*l.*, Charles Wantage. For the best ditto (narrow), to be worked by two horses, 2*l.*, Richard Coleman, Chelmsford. For the best roller, 2*l.*, Wightman and Co., Chard. For the best clod-crusher and clod-presser, 2*l.*, William Cambridge, Bristol.

SECTION 2.—CULTIVATION OF CROPS.

For the best corn drill, 5*l.*, Hornsby and Son, Grantham. For the best corn drill, for small occupations, in hilly dis-

tricts, 5*l.*, Hornsby and Son, Grantham. For the best turnip and manure drill, 5*l.*, Hornsby and Son, Grantham; ditto, highly commended, J. L. Bowhay, Modbury. For the best and most economical small occupation seed and manure drill, for flat or ridge work, 5*l.*, Holmes and Son, Norwich. For the best seed distributor, worked by hand, 2*l.*, Fowler and Fry, Bristol. For the best general manure distributor, 3*l.*, J. L. Bowhay, Modbury. For the best horse-hoe for green crops on the ridge, 2*l.*, William Busby, Bedale; ditto, commended, James Comins, South Molton; ditto, commended, R. Bowey, Ugborough. For the best ditto, on the flat, 2*l.*, William Busby, Bedale; ditto, commended, R. Bowey, Ugborough.

SECTION 3.—HARVESTING CROPS, AND PREPARING FOR MARKET.

For the best reaping machine, 5*l.*, Obediah Hussey. For the best haymaking machine, 3*l.*, Smith and Ashby, Stamford. For the best horse rake, for hay or corn, 2*l.*, J. and F. Howard, Bedford. For the best portable steam-engine, not exceeding four-horse power, 15*l.*, Hornby, Barrett, and Exall, commended. For the best portable threshing machine with straw shaker, to be driven by steam, not exceeding for four-horse power, 5*l.*, invented and manufactured by Mr. Burrell, Thetford, Norfolk; Dray and Co., London, exhibitors; ditto, highly commended, Holmes and Sons, Norwich. For the best portable threshing machine, with straw shaker, not requiring more than four horses, 5*l.*, B. J. Webber, Newton Abbott. For the best straw shaker, 1*l.*, Holmes and Son, Norwich. For the best portable threshing machine, not requiring more than two horses, 5*l.*, Barrett and Co., Reading. For the best hand-power threshing machine, 3*l.*, Barrett and Co., Reading. For the best machine for stamping seed out of flax, 1*l.* No competition. For the best cloverseed drawer or sheller, 1*l.* Holmes and Son. For the best Winnowing machine, 3*l.* Hornsby and Co., Grantham; ditto, commended, W. Twose, Halberton. For the best one-horse cart, for general purposes, 4*l.*, W. Busby, Bedale, and T. Milford, Thorverton; prize to be divided. For the best two-horse waggon, 4*l.*, T. Milford, Thorverton; commended, J. Heard, Sandford.

SECTION 4.—PREPARATION OF FOOD FOR STOCK.

For the best chaff and litter cutter, worked by horse or steam power, 5*l.*, Smith and Ashley, Stamford; commended, Dray and Co., London. For the best chaff cutter, worked by hand, Richard and Chandler 2*l.*, R. Cornelius, Plymouth, exhibitors. For the best turnip cutter for cattle, 2*l.*, H. Carson, Warminster. For the best turnip cutter, for sheep, 2*l.*, Burgess and Key, London. For the best corn and pulse bruiser, 2*l.* W. P. Stanley, Peterborough.; highly commended, Dray and Co., London; commended, Whitmere and Chapman, London. For the best oil-cake crusher, suited to crush every description of cake, 2*l.*, Fowler and Fry, Bristol. For the best gorse bruiser, 3*l.* No competition. For the most economical steaming apparatus, for preparing food for cattle, pigs, &c., 5*l.*, W. P. Stanley, Peterborough; ditto, commended, R. Cornelius, Plymouth.

SECTION 5.—MISCELLANEOUS.

For the best churn, £1, Burgess and Key, London. For the best cheese-press, £1, W. Carson, Warminster. For the best apple mill (crushing pips at the same time), £3 (no award). For the best cider press, £2, A. Smith, Exeter. For the best machine for dressing flax, £3 (no competitor.)

SECTION 6.

For the best and most economical collection of implements suited to tenants occupying not more than 100 acres of arable land, besides any other land kept permanently in grass, £10, Barrett & Co., Reading. For the best collection of small edged and other small tools used in husbandry, comprising not less than twenty, £5 (prize withheld). Winton's forks (highly commended), Burgess & Co., London, exhibitors. For the best collection of draining tools, £3, Burgess and Key, London. For the best collection of mining tools, £5, (no competition).

SPECIAL AWARDS.

W. Busby, Bedale, for a cheap Norwegian harrow and clod crusher, £1. C. H. Webber, for an iron field roller, £1. J. L. Bowhay, turnip and manure drill, £1. J. L. Bowhay, seed and manure drill, ridge work, £1. R. S. Reeves, for Chandler's liquid manure drill, £2. Hill & Co., for an iron rick stand, £2. Hill & Co., for a wrought-iron skim, with coulters, £1. Alex. Smith, gravel and manure screen, £1. J. Wescott, Beehives, £1. G. R. Turner, double plough, £1.

PRIZE LIST OF POULTRY.

Judges: E. BOND, Esq., Q.C., Middleton Lodge, Leeds; Mr. JAMES BISSELL, Birmingham; T. J. COTTLE, Esq., Pulteney Villa, Cheltenham.

CLASS 1.—DORKING.—1st prize, Capt. W. W. Hornby, R.N., Knowsley Cottage, Prescot, Lancashire; 2nd, Capt. W. W. Hornby, R.N., Knowsley Cottage, Prescot, Lancashire; 3rd, Miss Ann Willcox, Nailsea Court, Somerset. Highly commended, Mr. Geo. Mc Cann, Graham House, Great Malvern, Worcestershire; Mr. C. Rawson, The Hurst, Walton-on-Thames, Surrey; Mr. H. Curtis, Westbury-on-Trym, near Bristol. Commended, Mr. H. Blandford, Sandridge, near Chippenham, Wilts; Mr. St. Vincent L. Hammick, Milton Abbot, Devon.

CLASS 2.—DORKING CHICKENS.—1st prize, Capt. W. W. Hornby, R.N., Knowsley Cottage, Prescot, Lancashire; 2nd, Mr. J. R. Rodbard, Aldwick Court, Wrington, Somerset. Commended, Ralph Neville, Esq., Butleigh Court, Glastonbury, Somerset.

CLASS 3.—SPANISH.—1st prize, Capt. W. W. Hornby, R.N., Knowsley Cottage, Prescot, Lancashire; 2nd, Capt. W. W. Hornby, R.N., Knowsley Cottage, Prescot, Lancashire; 3rd, R. T. Head, Esq, The Briars, Alphington, Devon. Commended, Miss A. E. Goodenough, Bay Mount, Torquay.

CLASS 4.—SPANISH CHICKENS.—1st prize, not of sufficient merit; 2nd, Boughton Kingdon, Esq., Paul-street, Exeter.

CLASS 5.—COCHIN CHINA (Buff or Cinnamon).—1st prize, Mr. J. Cattell, Moseley Wake Green, Birmingham; 2nd, Mr. Thos. H. Potts, Kingswood Lodge, Croydon, Surrey; 3rd, Mr. C. Rawson, The Hurst, Walton-on-Thames, Surrey. Highly commended, Mr. H. E. Gurney, Lombard-street, London; Mr. J. R. Rodbard, Aldwick Court, Wrington, Somerset. Commended, Mr. R. T. Head, The Briars, Alphington, Devon; Mr. C. Rawson, The Hurst, Walton-on-Thames, Surrey; Miss Elizabeth Watts, Monk Barns, Hampstead, London.

CLASS 6.—COCHIN CHINA. (Buff or Cinnamon) CHICKENS.—1st prize, Mr. W. H. Snell, Shirley Cottage, Norwood, near London; 2nd, Mr. J. R. Rodbard, Aldwick Court, Wrington, Somerset. Highly commended, Mr. Thos. H. Potts, Kingswood Lodge, Croydon, Surrey; Mr. W. H. Snell, Shirley Cottage, Norwood, near London; Mr. Cyrus Clark, Street, near Glastonbury, Somerset; Mr. James Cattell, Moseley Wake Green, near Birmingham. Commended, Mr. R. T. Head, The Briars, Alphington, Devon; ditto, Mr. R. T. Head, the Briars, Alphington, Devon; Mr. J. R. Rodbard, Aldwick Court, Wrington, Somerset.

CLASS 7.—COCHIN CHINA.—Dark.—1st prize, Mr. Thos. Adkins, Baddicombe, Torquay; 2nd, Mr. W. E. Gillett, Fairwater House, Taunton, Somerset; 3rd, Mr. William Wevill Rowe, Longbrook, Milton Abbot, Devon.

CLASS 8.—COCHIN CHINA (Dark) CHICKENS.—1st prize, Mr. R. T. Head, The Briars, Alphington, Devon; 2nd, Miss Elizabeth Watts, Monk Barns, Hampstead, London.

CLASS 9.—GAME.—1st prize, Mr. Robert Baker, Ermington, near Ivybridge, Devon; 2nd, Capt. W. W. Hornby, R.N., Knowsley Cottage, Prescot, Lancashire; 3rd, Rev. Charles T. James, Ermington, near Ivybridge, Devon. Highly commended, Mr. Henry Sewill, Upton-on-Severn, Worcestershire. Commended, Mr. J. Michelmore, Berry House, near Totnes, Devon; Mr. Frederick A. Trenchard, Taunton, Somerset; Mr. H. Shield, Taunton, Somerset; Mr. Henry Sewill, Upton-on-Severn, Worcestershire.

CLASS 10.—GAME (CHICKENS).—1st prize, not of sufficient merit; 2nd, Mr. Robert Baker, Ermington, near Ivybridge, Devon.

CLASS 11.—SILKS.—1st prize, Mr. W. E. Gillett, Fairwater House, Taunton, Somerset.

CLASS 13.—MALAY.—1st prize, Mr. Cyrus Glark, Street, near Glastonbury, Somerset; 2nd, Rev. C. H. Archer, Lewannick Vicarage, Cornwall.

CLASS 15.—GOLDEN PENCILLED HAMBURGH.—1st prize, Mr. Josiah B. Chune, Coalbrook-dale, Shropshire; 2nd, Mr. Cyrus Clark, Street, near Glastonbury, Somerset. Commended, Mr. Chas. Edwards, Brislington, near Bristol.

CLASS 16.—SILVER-PENCILLED HAMBURGH.—1st prize, not of sufficient merit; 2nd, Mr. Cyrus Clark, Street, near Glastonbury, Somerset.

CLASS 17.—POLAND FOWL (Golden Spangled).—1st prize, Mr. C. Rawson, The Hurst, Walton-on-Thames, Surrey; 2nd, Mr. R. H. Bush, Litfield House, Clifton, near Bistol.

CLASS 18.—POLAND FOWL (Silver Spangled).—1st prize, Mr. C. Rawson, The Hurst, Walton-on-Thames, Surrey; 2nd, Mr. Thos. H. Potts, Kingswood Lodge, Croydon, Surrey; highly commended, Mr. Cyrus Clark, Street, near Glastonbury, Somerset; commended, Mr. James Bryant, jun., Plymouth.

CLASS 19.—POLAND FOWL (White Tops).—1st prize, Mr. C. Rawson, The Hurst, Walton-on-Thames, Surrey; 2nd, Mr. Chas. Edwards, Brislington, near Bristol.

CLASS 20.—HYBRIDS.—1st prize, not of sufficient merit; 2nd, ditto; 3rd, ditto.

CLASS 21.—BANTAMS (Gold Laced).—1st prize, Mrs. Elizabeth Brown, King's Cottage, Northend, Fulham, London; 2nd, Mr. William Norsworthy, 7, Lower Prospect Place, Exeter; commended, Mr. C. Rawson, The Hurst, Walton-on-Thames, Surrey.

CLASS 22.—BANTAMS (Silver Laced).—1st prize, Capt. W. W. Hornby, R.N., Knowsley Cottage, Prescot, Lancashire; 2nd, Mrs. Elizabeth Brown, Northend, Fulham, London.

CLASS 23.—BANTAMS (White).—1st prize, Rev. Grenville F. Hodson, Chew Magna, Somerset.

CLASS 24.—BANTAMS (Black).—1st prize, Mr. William Norsworthy, 7, Lower Prospect Place, Exeter; 2nd, Mr. Wm. Norsworthy, 7, Lower Prospect Place, Exeter.

CLASS 25.—DUCKS (White Aylesbury).—1st prize, Rev. Robert Baker, Compton Martin Rectory, Somerset; 2nd, Rev. Grenville F. Hodson, Chew Magna, Somerset; commended, Mr. William Wevill Rowe, Longbrook, Milton Abbot, Devon, and Mr. Cyrus Clark, Street, near Glastonbury, Somerset.

CLASS 26.—DUCKS (Rouen).—1st prize, Capt. W. W. Hornby, R.N., Knowsley Cottage, Proscot, Lancashire; 2nd, Mr. William G. Courtis, 4, Lipson Terrace, Plymouth; commended, Mr. W. Wevill Rowe, Longbrook, Milton Abbot, Devon.

CLASS 27.—DUCKS (Muscovy).—1st prize, Mr. Thos. Twose, Bridgewater, Somerset; 2nd, not of sufficient merit; commended, Mr. Edward Burton, Tregolls Cot, Truro.

CLASS 28.—GEESE.—1st prize, Capt. W. W. Hornby, R.N., Knowsley Cottage, Prescot, Lancashire; 2nd, Mr. C. Rawson, The Hurst, Walton-on-Thames, Surrey; commended, Mr. William Northey, Lake Farm, Lifton, Devon.

CLASS 29.—TURKEYS.—1st prize, Mr. John R. Rhobard, Aldwick Court, Wrington, Somerset; 2nd, Mr. Wm. Northey, Lake Farm, Lifton, Devon; commended, Mr. R. T. Head, The Briars, Alphington, Devon, Miss Mary Hill, Brockley Court Farm, Brockley, Somerset, and Mr. Frederick Marshall, Morley House, Plymouth.

CLASS 30.—TURKEY CHICKENS.—Prize, not of sufficient merit.

CLASS 31.—PIGEONS (Carriers).—Prize, Mr. William J. Square, Cobourg Street, Plymouth; commended, Mr. William J. Square, Cobourg Street, Plymouth, and Mr. Edward Burton, Tregolls Cot, Truro.

CLASS 32.—PIGEONS (Barbs).—Prize, Mr. Edward Burton, Tregolls Cot, Truro.

CLASS 33.—PIGEONS (Pouters or Croppers).—Prize, not of sufficient merit.

CLASS 34.—PIGEONS (Runts).—Prize, Mr. C. Rawson, The Hurst, Walton-on-Thames, Surrey.

CLASS 35.—PIGEONS (Fantails).—Prize, Mr. C. Rawson, The Hurst, Walton-on-Thames, Surrey.

CLASS 36.—PIGEONS (Jacobins or Cappers).—Prize, not of sufficient merit.

CLASS 37.—PIGEONS (Trumpeters).—Prize, Mr. Edward Burton, Tregolls Cot, Truro; commended, Mr. Charles Bluett, Hammet Street, Taunton, Somerset.

CLASS 38.—PIGEONS (Almond or Ermine Tumblers).—Prize, Mr. Charles Bluett, Hammet Street, Taunton, Somerset.

EXPORT OF BRITISH CATTLE.

Whatever injury the importation of foreign stock may have inflicted on the breeders of this country, it appears likely to be more than compensated by our own export trade in the same description of produce. The real test of good wares is the certainty with which customers return for a further supply of what they have already tried. The English breeds of cattle have been put through this ordeal, and, as it would seem, with the most satisfactory results. Difference of climate seldom deteriorates them; less skilful management, when first commencing with them, has rarely found more to complain of. Our stranger friends come again and again for the same sort—prepared even to bid more freely, from the experience they have so far gained of the animal they require.

It is a question with us whether more attention to the wants of the foreign market would not be to the advantage of our farmers and graziers generally. As it is, the benefits of this kind of business are enjoyed by comparatively a very few of the more celebrated breeders—gentlemen to whom the exhibition and award lists of the Royal and other agricultural societies have supplied the place of the most telling advertisements. It is but fair to add, that they have only duly earned their reward. Good judgment, backed by a determination to do their best, has characterised the course they have so long persevered in. Day by day, too, is their return becoming more regular in its action, and more remunerative in its average.

The cause of such a monopoly is simply this: the foreigner *will* have the best, money can buy. And no wonder either that he is found to be so particular on this point. It could be never worth the while of our continental or American friends to come so far as they do for anything of an inferior quality. They make it their especial study to become acquainted with the best points and grand characteristics of those animals they are in search of. It is, indeed, a well-known fact that no imperfect beast, deficient either in form, size, or colour, will "go down" with the foreigners. As in their selection of the horse, there must be no blemish; if there is, he may perhaps be got rid of at a price to a neighbour, but it is certain the stranger will have him "at no price at all."

Although to obtain the best article we must, as a rule, go to the best shops and pay the best prices, the buyers who now periodically visit this country are not so much at the mercy of any one celebrated "firm" or two as might at first be supposed. The earnestness with which they mostly devote themselves to the object, and the experience they gradually gain in its pursuit, render many of them excellent judges. This is more particularly the case with the Americans. There are many Statesmen who can by this pick out a beast as readily and as safely as our own authorities; while in pedigree and the general history of the breeds they are often far deeper read.

And it must be all for the best that they are so well able to take care of themselves. This very intimacy with the business they are engaged in will give a legitimate character to the foreign market, and free it from that "fancy price" appearance it until lately had. There is little doubt that, so far from the demand being exhausted, it will become more regular and general, and hence afford a fairer opportunity for the whole body of breeders enjoying a share in furnishing the supply. If, as of late years has been shown, our front-rank men can occasionally be beaten with their own weapons, it seems strange that their opponents should not make the best of what they have accomplished. We speak with no bias against any of our long-established and most celebrated breeders; on the contrary, we have the highest respect for what their energy and abilities have done—not only for themselves, but for the community. We are quite sure, too, that they will long yet continue to reap the profits of their labour. What, however, we wish to see, is greater numbers turning their attention to the production of the very best sorts of cattle and sheep. To accomplish this they must, in the first instance, go to those who have already done as much, for the material to commence with; and if they will do so, we can hold out to them every reasonable promise of their yet further developing one of the most profitable branches in the business of the farm.

We are rather led into offering these suggestions from having lately been present at a sale of well-bred stock in the Baker-street Bazaar. The prices realized, as will be found in a report from a correspondent in the *Mark Lane Express*, and annexed to this article, were generally excellent. Twenty short-horn cows and heifers, including some heifer calves, averaged over sixty guineas each. It is curious, and it may be to the advantage of some of us, to observe what an effect the presence of a few strangers amongst the company must have had on the estimate of these different lots. As we learn, for example, from the report in question, "the highest price was for a yearling heifer, deservedly called 'Beauty,' which was purchased by Mr. Noel Becar, of New York, for 150 gs. This gentleman has recently purchased several other very superior specimens from some of our most celebrated herds, on behalf of himself and Colonel Morris, the President of the New York State Agricultural Society." And, again, "Mr. Le Marchant bought four lots to go to Canada — 'Madrigal' at 80 gs.; 'Lady Betty' at 71 gs.; 'Bell' at 69 gs.; and 'Faithful' at 65 gs."

In another account, detailing the export of cattle from Liverpool, we are told that in "The Crown" were sent out "fifty head of the choicest specimens of short-horned cattle which could be bought in old England, several of them being purchased at prices which may appear incredible, as probably no ship was ever freighted with anything like so valuable a cargo of this description. Twenty-four head of cattle and a quantity of sheep, the property of Mr. R. A. Alexander, of Airdrie House, Scotland, were destined for his estate in Woodford County, Kentucky, United States. Some estimate may be formed of the high spirit and enterprize of this gentleman, when we mention that for two animals alone, a two-years-old heifer and a yearling bull, bred by Mr. Towneley, M.P., of

Towneley Hall, near Burnley, he gave the large price of £525." Many other animals of the same kind appear to have been shipped at very high prices, while the Southdowns, Leicesters, and Cotswolds must have been bought up in a proportionately good market.

"The Crown," bound for Philadelphia, takes out, we are assured, the richest cargo of cattle ever shipped. We have little fear, however, but that she will, at intervals, be followed by many a vessel quite as well laden. In fact, a second report from our Liverpool correspondent, to be found in our paper of this day, shows that other ships, with quite as valuable freights, will be shortly on her track. It only remains for us to look to the supply, as well as to afford to our customers the greatest facilities in making their purchases. Consulting either their convenience or that of the home market, it strikes us that periodical sales of cattle, like those at Tattersall's, or Aldridges' for horses, would be attended with mutual advantages for both buyer and seller. We do not go so far as to say that they should be continued all the year through; but we think that at certain times—in the spring, or "season," more particularly—they would certainly be found to answer. The one we have already alluded to as having taken place within this fortnight, in Baker Street, holds out every encouragement for the attempt being made. The prices were not only good, but the attendance of English breeders—such as Mr. Fawkes of Farnley, Mr. Jonas Webb, and Mr. Fisher Hobbs—is significant of what support might be expected. We write with but one object—the benefit of the practical agriculturists of this kingdom; and we leave what we have written to their best consideration.

EXPORT OF SHORT-HORNED CATTLE, SHEEP, &c.

Seldom has it fallen to our lot to chronicle so valuable a cargo as left this port on Saturday, June 4, in the "Crown" for Philadelphia; more particularly as relating to the agricultural interest. This may be inferred when we mention that in the ship mentioned were sent out fifty head of the choicest specimens of short-horned cattle which could be bought in old England: several of them being purchased at prices which may appear incredible; as probably no ship was ever freighted with anything like so valuable a cargo of this description. Twenty-four head of cattle and a quantity of sheep, the property of R. A. Alexander, Esq., Airdrie House, Scotland, were sent in her, destined for his estate in Woodford County, Kentucky, United States. Some estimate may be formed of the high spirit and enterprize of this gentleman, when we mention that for two animals alone, a two-years old heifer and a yearling bull, named the "Duchess of Athol," and 2nd "Duke of Athol," bred in this county by Charles Towneley, Esq., M.P., Towneley Hall, near Burnley, he gave the large price of £525. To Mr. Strafford, of London, who had the superintendence of Mr. Alexander's cattle, we are indebted for several interesting particulars relating to the stock, and who informed us that these two animals were the produce of one cow—"Duchess 54th"—bought at the sale of the celebrated herd of Short-horns of the late Thomas Bates, Esq., at Kirklevington, and bred since that gentleman's decease. We also noticed in the cargo some very fine young bulls, bought from the justly-famed herd of F. H. Fawkes, Esq., Farnley Hall, as well as some very choice cows and heifers from the well known herds of Messrs. Bell, Bolden, Cattley, Combe, Downs, Fuller, Lowndes, Tanqueray, Wiley, &c. The sheep, principally of the Cotswold or New Oxford breed, were from the crack flocks of Mr. W. Garne, of Aldsworth, and Mr. John Gillett, of Minster Lovell. The other portion of the stock consisted of 10 short-horned bulls and 15 cows and heifers of the same breed, selected at very high prices for a large importing company, also from Kentucky, the agents for which, Messrs. Dudley, Garrard, and Van Metre, have succeeded, after much time and trouble, in the purchase of a splendid lot of cattle and sheep from the best herds and flocks in the kingdom. In evidence of this we may cite those of the Earl Ducie, Lords Burlington and Feversham, Messrs. Ambler, Beasley, Bell, Booth, Emmerson, Fawkes, Hall, Hopper, Maynard, Smith, Tanqueray, and Towneley. They also had several fine specimens of the Cotswold sheep from the flocks of Mr. W. Garne and Mr. Lane, of Broadfield; some pure Leicesters from the flock of Mr. W. Sanday, of Holmepierpoint; and some prime Southdows from the unrivalled flock of Mr. Jonas Webb of Babraham; besides a valuable stallion of the Yorkshire or coach horse breed; we can only hope they may have the good fortune to get them out safe and well, and reap the reward which such spirited exertions deserve. We believe for the freight alone, exclusive of the food and fittings requisite for such a voyage, that about £1,200 was paid, while the cost of the stock, with expenses incurred, must have exceeded £5,000.—*From a Correspondent at Liverpool.*

EXPORT OF BRITISH CATTLE.—We have again to report a further exportation of valuable cattle from this port during the past week. In the ship "Mary Carson," for Philadelphia, was sent out by Mr. Strafford, of London, the splendid young short-horned bull "Harry Lorcequer," bought at the sale of Mr. F. H. Fawkes, of Farnley Hall, for 130 gs.; also two other valuable young bulls, "Liberator" and "Squire Gwynne (2nd)," bred by Mr. J. S. Tanqueray, of Hendon, with several heifers from his herd; as well as others from the herd of the Honourable H. N. Hill, Berrington, and a number of Cotswold sheep. Mr. Bell, of Mosbro' Hall, likewise sent in this ship eight shorthorned heifers from his own herd, and a young Devon bull bred by Mr. Davey, of South Molton, with some Devon heifers bred by the Earl of Leicester. Two other valuable cargoes are about to be despatched. "The Star of the South" will take out the far-famed bull "Balco," bred by the late Mr. Bates, of Kirklevington, and purchased at his sale in 1850, when one year old, by the Earl of Burlington, for 155 guineas. He has been used the last two seasons by Mr. Tanqueray, at Hendon, of whom he has been recently purchased by Colonel L. G. Morris, the President of the New York State Agricultural Society, on behalf of himself and Mr. Becar, of New York. These gentlemen have also purchased some highly-valuable cows and heifers from Mr. Tanqueray, as well as of the Hon. H. N. Hill and Mr. Harvey

Combe; they have further selected some splendid South Down sheep from Mr. Jonas Webb, with a quantity of Berkshire, Suffolk, and Yorkshire pigs. The same ship takes out two very choice Devon heifers from Mr. George Turner's herd. Again, Messrs. Browning, Farrar, and Phellis, agents for the Madison County importing Company, Ohio, U.S., are sending in the "Monsoon," 23 head of shorthorned bulls, cows, and heifers from the herds of Messrs. Booth, Fawkes, Hall, Knowles, Lawson, Raine, Thornton, Tanqueray, &c. Amongst the bulls is the first prize yearling at Sheffield, bred by Mr. Hall, of Kiveton Park. They will have, too, a number of improved Leicester rams and ewes from the flocks of Messrs. Brooke, Chapman, Hall, and Wood, as well as 13 pigs from the best breeders. Some estimate of the importance of these exports, destined for several parts of the United States, may be formed, when we mention that, from the best information we could procure, the cost of these, with the other stock mentioned in our last week's report, cannot be far short of £12,000, exclusive of the expense of shipping—in itself a heavy item, approaching, in fact, to £2,000.—*(From a Correspondent at Liverpool).* We were in hopes that we should have been enabled to add to the above a full report of the sale of Mr. Grundy's herd of shorthorns, under the direction of Mr. Wetherell, at Wolstenholme Hall, Rochdale, on Wednesday last. The average prices, we hear, were very good; but this week we can do no more than give those of the following animals, all bred by Mr. Grundy himself:—Sally, two years old, £76 13s.; Silence, two years old, £63; Spinster, two years old, £43 1s.; Souvenir, two years old, £53 11s.; Wreath, one year old, £157 10s.; Bouquet, one year old, £50 8s.; Olive Branch, one year old, £35 14s.; Cameo, two years old, £210; Sweet Lucy, two years old, £115 10s.; Gipsy Queen, one year old, £53 11s.; Carey, one year old, £32 11s.; Jessamine, seven months old, £14 14s.; Sympathy, five months old, £32 11s.

SALE OF SHORT-HORNED CATTLE.

On Wednesday, June 1, the sale of a portion of the celebrated herd of shorthorns belonging to Harvey Combe, Esq., Cobham Park, Surrey, were submitted for sale, by auction, by Mr. Strafford, at the Bazaar, Baker-street, London, attracting a very numerous and highly respectable company of noblemen and gentlemen; amongst whom were several of the leading agriculturists and breeders of the United Kingdom, as well as from Canada and the United States. The prices realized fully prove the high estimation in which the stock were held. 20 cows, heifers, and heifer-calves were sold for £1,102 5s., averaging upwards of £60 each; the highest price was for a yearling heifer, deservedly called "Beauty," which was purchased by Noel J. Becar, Esq., of New Pork, U. S., for 150 gs This gentleman has recently purchased several other very superior specimens from some of our most celebrated herds on behalf of himself and Col. L. G. Morris, the president of the New York State Agricultural Society. Several other cows and heifers realized high prices, as "Violet," sold to S. Marjoribanks, Esq., Bushey Grove, for 135 gs.; also "Dairymaid," at 91 gs. Mr. Le Marchant bought four lots to go to Canada, "Madrigal" at 80 gs, "Lady Betty" at 71 gs., "Belle" 69 gs., Faithful" 65 gs. Amongst the other purchasers were the Earl of Macclesfield, Sir J. V. Shelly, Bart., M.P., H. Hall, C. Tanqueray, J. H. Vivian, and J. Whittonstall, Esqrs. After the sale of the above, a few young bulls, from the far-famed herd of J. S. Tanqueray, Esq., of Hendon, Middlesex, were also offered. The highest price was for "Liberator," under one year old, 80 gs. Another bull calf, "Friar Balco," nine months old, sold to Mr. Champion for 63 gs. The former was bought for Mr. Kelly, near Philadelphia, United States. The others brought good prices. The total amount of the sale for thirty lots was £1,617.—*From a Correspondent.*

ESTIMATE OF DRAINING WITH THE AID OF A DRAINING-PLOUGH.

COMMUNICATED BY MR. WILSON FFRANCE.

The cost of the plough, in full working order, £20.
The cost of using it for one day as follows:—

	£	s.	d.
14 horses, at 3s. per day.....	2	2	0
11 men (drivers and holders), at 2s.	1	2	0
Wear and tear, interest of capital, say ..	0	8	0
	£3	12	0

The drains by the above implement are opened 20 inches deep, 16 inches wide at the top, and 8 inches wide at the bottom, thus leaving room for men to follow with draining spades to the required depth.

In 8 hours (one day's work) this plough opens drains over 18 statute acres, at 22 feet apart, consequently opening about 1,800 roods, of 7 yards each, and, according to the above estimate, costing one farthing and 9-10ths of a farthing per rood.

This implement, within the above time, cuts, throws out, and lays by the sides of the 1,800 roods of drains 2,333 cubic yards of soil, costing for such removal 4-10ths of a penny per cubic yard, which is a considerable saving effected as compared with manual labour.

In ordinary subsoils, and in most localities, the common drains can be finished after the plough with spades, to the depth of 3 feet (laying the tiles included), at a cost of from 2½d. to 3d. per rood of 7 yards each, and the main drains, to the depth of 40 inches, at a cost of 3½d. per rood. The filling-in the drains is accomplished by a plough, with 3 horses, and a man and boy, and by another man finishing the soil on the drains, which will be an addition of 4-10ths of a penny per rood; consequently, the total cost of draining one statute acre, as above described, will be, on an average, about 30s. The cost of tiles will vary, according to locality and the sizes used.

RAWCLIFF TILERY, 1853 (CLAYTON'S MACHINE).

	s.
1½ inch, per thousand	14
2 " "	18
2¼ " "	20
2½ " "	22
3 " "	25
4 " "	35
5 " "	40
6 " "	65

At these prices, where 3-inch pipe tiles are used for main drains, and 2¼-inch for common drains, the drainage of a statute acre, with the above implements, &c., and at the above-named widths and depths (exclusive of cartage), may be calculated at about 75s.

The draining-plough enables the occupier to get a field speedily drained, and the use of it is of great importance where manual labour is scarce.

Horses in the above estimate are charged each 3s. per day, which is an outside price for farmers' horses at the season of the year when most draining is performed. If farmers will assist each other with horse-power, the charge for horses might be calculated as trifling.

Rawcliff Hall, Feb. 2.

WAGES.

THE EQUITABLE WAGE PRINCIPLE *v.* THE LAW OF SUPPLY AND DEMAND.

No. VII.

According to the law of supply and demand—or, indeed, to quote the words of Mr. Mill, "when work increases (without a corresponding increase in the number of labourers), the demand for labour consequently increases — while the supply continues the same, wages must rise." This is true only so long as the capital of the trade, or fund out of which labourers are paid, admits of being augmented. We are naturally brought, therefore, to the consideration of this wage fund, which must determine the amount given in exchange for labour. It depends upon the amount of capital set aside for production. But it is the third part of this amount; there being two fellow funds, one for the purchase of materials, the other for the purchase of implements and buildings, &c. It appears to me to be a simple question of arithmetic, that the increase of any one of these funds (the whole remaining the same) must be followed by a proportionate decrease in the others. The material fund, which provides the materials on which labour is to be expended, necessarily regulates the amount of labour done; and according to the amount of material, so must be the work. To obtain a larger amount of materials, you increase the fund they represent at the expense of the two remaining funds, and similarly of the others. In our country the fund set aside for tools, machinery, and building, is much on the increase, and must continue to be so; and we see, therefore, that an increase of the material fund is followed necessarily by a decrease of the wage fund. In other words, while we act on present principles, *the more work there is to do, the less is there to pay for its being done.* I have seen the case stated in this way, I think: Granted that the sum annually expended on materials in this country equals £50,000,000 sterling, and that the sum paid for operations upon these materials is £100,000,000 sterling; in that case, for the making up of every pound's worth of stuff the labourer will receive two pounds. Granted, again, that the sum expended upon materials is doubled, the case will be reversed, and the labourer will have to perform double the work for one-fourth the pay.

But it will perhaps be objected, we have seen wages rise to extravagant rates, at the same time as both material and sinking funds were greatly increased: the late railway mania exhibited this fact.

Very true, I may reply; an increased demand for labour may, in any one trade or in any one branch of industry, be attended with a rise of wages under these circumstances, but this cannot be the case with all. To meet the sudden demand, such as that referred to in the history of railroads, it is more sensible to suppose that a considerable sum was withdrawn from other trades and invested in railroads, than that any sudden augmentation of the gross savings of the country took place. There is nothing hypothetical in the first and rational solution of the difficulty, as all may know who felt or witnessed the national depression that followed this temporary destruction of our commercial equilibrium.

It may be objected further, in view of the relative increase and decrease of the two funds under consideration, that although more labour would meet with less remuneration, commodities in abundance, and consequently in cheapness, would bear a sensible proportion to the fall in wages. Certainly this would make the case better, but not by much; and though easing the descent, a *descent* it must be, as those who examine the question at length will prove. Now the effect of all this upon the monied classes is precisely the reverse: theirs is a decided and large gain. And here is the view of the question that arouses within me no slight indignation. This increase of materials to be manufactured, and decrease of remuneration for their manufacture, is one of the crying evils of the age; and here, indeed, we have the secret of the over-worked and under-fed condition of the operatives: and thus it appears that cheapness is produced principally *at the operatives' expense.*

Apropos of this, Mr. Mayhew tells us that a well known house, having reduced the wage of 1,000 workmen in their employ to one-third below the amount paid by the "honourable" part of the tailoring trade, or from 36s. to 24s. a week for the best hands, have been enabled to force their trade to an enormous extent, and to amass £160,000 in a very few years. This is the effect of cheapness upon the *employer;* and the following is an example of the effect of cheapness, brought about by this process, upon the *employed.* It is from Mr. Mayhew's celebrated communications to the *Morning Chronicle.* A waistcoat hand gives his experience:

"The effect that the continued reduction has had upon my earnings is this: before the year 1844 I could live comfortably, and keep my wife and family (I had five in family) by my own labour. My wife then attended to her domestic and family duties; but since that time, owing to the reduction in prices, she has been compelled

to resort to her needle, as well as myself, for her living. [On the table lay a bundle of crape and bombazine, ready to be made up into a dress.] I cannot now afford to let her remain idle—that is, if I wish to live, and keep my children out of the streets, and pay my way. She makes dresses. I never would teach her to make waistcoats, because I knew the introduction of female hands would be the ruin of my trade. *With the labour of myself and wife now I can earn 32s. a week, and six years ago I could make my 36s. by my own labour alone.*"

Probably by this time, poor fellow, he has been obliged to put stools by him for one or two out of "the family of five," to help him to make up the amount originally earned by his own unaided hand; and thus indirectly, by bringing female and child labour into competition with his own (but not the less certainly), lessening the amount of remuneration. How many the instances we could all bring from the rural districts, as well as from the crowded streets of the metropolis, to confirm this evidence! The low, the besotted, the immoral condition of our population, all is referrible to this same source. Who that considers the relative position, or rather dis-position of the working people of this country and their employers, can wonder that there is neither intercourse nor sympathy between them? They say that the feudal times, with their barons, have passed away; but are there not new barons, a race of "purse-girded potentates," around whose castles people cluster, and upon whose favour thousands depend for their daily bread? The great manufacturers and the great merchants are now our chief feudal powers; and the civil warfare that they give rise to is not the less fatal because it is less bloody. The result remains pretty much as of old: the baron gets all the spoil, whereas the follower reaps the thumps; to which very pleasant and facetious arrangement the magnates profess not to have the slightest objection.

"It is still more important," says a popular author of our day, writing upon a subject in which he has occasion to touch upon this point, "that English masters should be considerate. We are not much in danger of cruelty—we are greatly in danger of indifference. Few would do their men harm, would tamper with their rights, would enforce anything manifestly injurious. All would pay their men regularly, punctually, and in full—of course they would, just as they would oil the machinery. But the cases are many wherein the machinery is regularly oiled, the men regularly paid, and the master has just as much communication with the one as with the other. If one breaks a wheel, he sends for an engineer; if the other breaks a bone, he sends for a doctor; if the one is worn out, it is removed; if the other is worn out, he is dismissed. Both are very useful, and perhaps the master can tell you the name of both: of the machinery, always; of the man, sometimes."

And what, my readers, do many of you care about those whom you employ, save as to the work they can perform in a specified time, and the smallest sum they can be made to receive for it? One truth there is, and it affords a little consolation to the labourer: wages may be reduced, and reduced further and further from the point of remuneration, but below the point of *mere subsistence they cannot be driven.* In this state of things numbers of course would have to live, as they do, unemployed, and to be supported by capitalists and the industrial community, in the capacity of beggars and of thieves. This is a good arrangement, for it keeps the benevolent faculty in practice, and encourages rising architectural talent upon prison elevations and county-court houses, and furthermore gives rise to that celebrated functionary Policeman X., who is but a type of that invaluable class of men upon whom rests the imperial throne of Austria.

Of this supernumerary order, known by the name of the "Dangerous Order," Carlyle humanely recommends that they should be "shot, and swept into the dustbin." He is fond of heroism: here is a theatre whereon to exercise his giant power; armed with the jaw-bone of antiquity, he too may slay his thousands!

But, by way of concluding this letter—for the subject so enlarges upon me that I must retain for my next communication *the* point upon which I had hoped before now to have explained my views—I must again affirm, and the more decidedly, that the law of supply and demand cannot possibly be a fair method of testing the amount of the share of the produce accruing to the labourer, *seeing that it pays no regard to the value of such produce, but merely to the sum set aside by the employers for the remuneration of their workpeople during the performance of the work.*

No. VIII.

There can be no doubt as to the fact that labour is an evil, else why do folks pay to be rid of it, or why do others require pecuniary *inducement* to undertake it? If labour is a curse, it is at least *the means of living,* for it is said "that in the sweat of his face shall man eat his bread," and the great bulk of the people have no other means of obtaining their livelihood. In a land so thickly populated as ours, the primitive usage of collecting the wealth nature spontaneously afforded to satisfy the wants of the day, is necessarily changed. When such sources of subsistence are found insufficient to supply the increasing demands of a growing state, a different sort of labour must be resorted to, demanding more time, and energy, and skill: this goes by the name of production.

For this species of industry, adopted by all civilized nations and largely populated countries, *time* is essential. By the primitive mode, namely *collection*, the return is *immediate*: by the latter the result of the day's labour is not sufficient for the day's support. A considerable period must frequently elapse before that, in which man invests his labour is perfected and exchangeable. During this period he must live; the recurrence of hunger at regular times is inevitable, and must be met. As he must wait, therefore, so must he lay by a store of food to supply him during the interval. And as I think Mr. Newman, in his Elements of Political Economy, observes:—"since this stock can only be obtained by the abstinence of some of the labourers, that is to say, by their living on less than they had previously acquired, and since all men are not equally provident, it follows that some would possess that stock while others would be without the means of supporting themselves in the intervals of production." Thus we behold the origin of the two classes: capitalists and labourers. The one careful —the other careless; the one possessed of the sole means of obtaining future produce, and the other glad to exchange the only thing he has to exchange —his labour, for a share of the savings of his provident fellow. It does not follow that the respective qualities of these two classes, which in the first instance made the one masters and the other servants, should be equally true of the classes as we now see them: for I can perceive under the present state of things the most strictly provident families miserably poor, and multitudes of improvident masters comparatively rich; and while the others of them take the motto of one of our old earldoms, "Let Curzon hold what Curzon held," applying it in letter to those beneath them, we may still see the provident destitute, and the honest poverty-stricken.

It is easy to see in the aspect of affairs, that masters, when they are mean and unchristian, will take sordid advantage of the *necessities* of those they employ—yea, that they will make those necessities a source of large profit.

It follows naturally that *the less they part with to their labourers*, for reducing the material entrusted to them into articles of use and food, *the greater will be their gain*. Thus we see that the labourer can be and is reduced—looking at the working community at large—*to the mere subsistence point*; for those that are unemployed, and occupy our prisons and union-houses, are not forced below this point.

This servile and dependent condition of the people is not surely what it ought to be.

The fundamental axioms of political economy acknowledge the fact of a *partnership*; but that partnership only exists as an axiom, it is not carried out. The share of the capitalist is, of course, by far the greatest; but I maintain that the two should share in the proportion which they contribute towards the result. No one who has given a passing glance at the scale by which labour is remunerated, can prove that remuneration bears any proportion, or is intended to bear any proportion to the result produced.

It is stated, for instance, by M. de Villefosse, "that in France the labour exercised upon £1 worth of bar iron, in the manufacture of polished steel sword handles, increases its value to £927, or very nearly 1,000-fold. The sum actually paid in wages to the workmen engaged in the production of these articles may be stated at £300."

Is this remuneration that bears any proportion to the result? £1 worth of bar iron is, by the hand of man, made to be worth £1,000, and he receives £300 for his trouble.

Similarly as we have before seen, the padlock that is made for a halfpenny is sold for one shilling; and this does not show very well for labour being justly remunerated. The capitalist certainly should receive fair recompence for the use and risk of material, and for the advance of the weekly wage; but instead of taking a *portion*, it seems to me that he grasps nearly the *whole*. If we admit the law of supply and demand to be the guiding commercial principle, we must admit this procedure to be perfectly fair. "There is nothing like a good cry; so let the propounders of this theory throw up their caps and shout Success!"

It is right that capital should have, I again say, its just reward and encouragement; but I cannot see the justice of the way in which capitalists generally pay for labour, *without the slightest regard to the increased value that such labour may give to the articles on which it is exercised.*

There is a case much to the point, which I remember to have seen in one of Mr. Mayhew's works: he supposes a publisher to give a needy author £10 for writing a book, the sale of which ultimately was to produce £1,000 clear profit; and he asks whether, tested by the law of equity, it would be fair for the publisher to make no further return to the author. To a rabid economist the original transaction would be perfectly fair—yes, in this sense it is perfectly fair for the publisher to take advantage of the author's poverty, giving him a sum bearing no proportion to the ultimate value of his work.

A perfectly rose-water theory—adapted doubtless to a trading community, specially educated to the case. I readily own that the theory is not in good odour, and is far, very far, from becoming the general practice of the age. A pretty work should we have to metamorphose our present race of rabid sharks into anything like what the practical recognition of the Christian

code of morals would make them. The effort must be made, however; and there will be those who will see the good effects of a higher and sublimer principle than this—one more akin to the better part of poor degraded human nature.

Let any one but follow me to the sources I have visited to collect materials for these letters, and become acquainted with the instances of unremunerated labour: common they are to the metropolis and to the provinces. Everywhere we find them, everywhere they sicken the soul, and call forth the tear; and in the heart that has any sense of justice and virtue, there will be aroused a powerful indignation—not an indignation that spends itself in idle declamation, but an indignation that *gives energy and direction to the will to meet the wrong and maintain the right, against the strong arm of might.*

The law that allows such doings to be fair, is worthy of regulating the dealings of the pawnbroker, who will take in whatever the poor wretch that comes to him may have to pledge. Is it not conceived and executed in the precise spirit of the class? If we are, as Napoleon called us, a nation of shopkeepers, this is no reason why we should all choose such a vocation, and practise under the three balls!

Allow me on another occasion to finish this part of my subject by explaining my notion with respect to an equitable wage principle.

F. R. S.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

THE AUDIT OF ACCOUNTS was held on Friday, the 20th of May: present, Mr. Raymond Barker, V.P., and Colonel Challoner, on the part of the Finance Committee; and Mr. Knight of Edmonton, Mr. Dyer of Islington, and Mr. Geo. I. Raymond Barker of Fairford, in Gloucestershire, as Auditors on the part of the Society. The accounts were audited, examined, and certified as correct.

A SPECIAL COUNCIL was held on the same day, for the purpose of considering the half-yearly report to be made by the Council to the ensuing general meeting of the Society; Mr. Raymond Barker, V.P., in the chair; when, on the motion of Sir Charles Lemon, Bart., M.P., seconded by Mr. Milward and Colonel Challoner, such report was agreed to accordingly.

A WEEKLY COUNCIL was held on Wednesday, the 25th of May: present, Mr. Raymond Barker, V.P., in the chair, Lord Berners, Mr. E. Collingwood, Mr. Evan David, Mr. Dyer, Mr. Orlebar, Mr. Parkins, Mr. Spencer Stanhope, and Mr. R. Trench.

The names of 53 candidates were announced for election at the next meeting.

SWAMP DRAINING.—Mr. Adderley, M.P., communicated to the Council the following statement of suggestions in reference to swamp draining made to him by Mr. John Dumolo, of Dunton House, near Coleshill, Warwickshire:—

The state and condition of many hundred acres of land lying adjoining and near to rivers, brooks, and small watercourses, or on low levels, must have been a subject of notice to many who have interested themselves in the improvement of land. Such lands are frequently appropriated to the growth of grass and hay, and, when sound and capable of irrigation, probably rank amongst the most beneficial, yielding a greater profit at less cost than those of any other character. The object of this paper is to solicit the attention of the Council of the Royal Agricultural Society to the subject and to the drainage thereof. I, the writer, have no other object in view than to elicit a consideration of my suggestion; nevertheless, I may be allowed to observe that I have carried out the method of drainage hereinafter mentioned to some extent, with the best possible results. In the first place, the water is to be removed from the surface of the land in many places where there is scarcely any fall or outlet, excepting in the adjoining stream, that is to say, when the surface of the water in the adjoining river or brook is nearly even with the surface of the lands. Now, according to the notions of the writer, the drainage of land under these conditions in most cases may be made as effectual as is desirable, and in many cases the land made sufficiently sound for the heaviest of cattle; in such cases what now is of little or no value is made the most valuable, and in all cases the land rendered much more productive, and the quality of the produce improved. The method is simple, but may require a little engineering tact to accomplish the object. The drains must be laid even with the bottom of the adjoining river or brook, or at least two or three feet deep in the stream. There is no fear but the water will issue from such drains and always pass off at as great or greater velocity than those of the stream into which the drainage water will have to enter, by reason that the specific gravity of the drainage water out of such lands will, I may say always, be less than the river or brook water is. The only conditions I would observe necessary to be stipulated for are—1st, that a shaft or pipe be fixed at the upper end of the drain, so that the atmospheric pressure may bear thereon, but not allowed to pass through; 2nd, that the drains be laid in a proper and judicious manner, with pipes of not less than two inches bore, and that the trenches be well filled up; 3rd, that the least number of outlets into the discharging stream as practically necessary be made, and that such outlets be at the lowest part of the stream as regards the land to be drained. I may remark there will be no detriment to the drainage should the bed of the drain undulate, or be laid lower than the discharging orifice, but frequently it will be found advantageous to submerge the drains purposely, in order to exclude the atmospheric air, and thus prevent or lessen the danger of stoppages from the sedimentary accumulations of the peroxide of iron, which often abounds in lowlands and in bog earths.

Mr. David feared that the plan proposed would not sufficiently lead to the clearance of sedimentary matter; it appeared to be intended for very low meadows, which were often flooded, but had very little fall to outlet. He remarked, however, that the late Sir Robert Peel had lands of a similar character very successfully drained by Mr. Parkes, although the drains, in that case, could not be carried, he believed, as deep as desired. Mr. David referred to the exceptional character of the past winter season. He had observed the fall of rain for the last 30 years, but he had never, during that long period, found so great an amount fall in any one month as he had observed in December last. On his return home, he would furnish an accurate statement of the details, as indicated by his rain-gauge.—Mr. Raymond Barker, as chairman of the Thames Commission, had frequent opportunities of becoming acquainted with the effects of flooding and drainage on the meadows alongside the Thames, and of lower level than its bed. If these meadows could be freed from one foot of their flood surface-water, great benefit would result; but, when thoroughly drained, great injury was found to be inflicted on their owners, from the loss of their grass, hay, and after-feed, which took place in dry summers.

Expenses of Mapping.—Mr. Trimmer, of Wilmington, near Dartford, communicated the following statement in reference to the charges incurred in the construction of his proposed maps of estates, of which he had at a recent meeting submitted specimens, illustrating the agricultural and mineral resources of a portion of the estate of Sir Charles Elton, Bart., in Somersetshire:

At the meeting of the Council on the 20th of April inquiries were made as to the cost of obtaining a trace of an estate from the Tithe Maps, when I said I believed it to be 1d. per acre. I find, however, that the above charge is for a copy on mounted paper, and that the charge for a trace is much less, viz., a plain tracing, on a scale of three or four chains to an inch, 2s. per 100 acres; do. six chains, 1s. 6d.; do. eight to ten chains, 1s. and 1s. 3d. A tracing of small quantities, say a single field, 2s. 6d.; 100 acres ordinarily about 4s. But if of scattered fields, or embracing many buildings and ornamental grounds, or the inclosures are bounded by drains with double lines, the cost may be increased from 25 to 100 per cent. In the event of any landowner determining to have a map of the soils, subsoils, and substrata of his estate, and possessing no modern map, his plan would be to get such a trace, and after having it examined on the ground, for the insertion of any alterations in it since the map was made, he can have it lithographed at the cost on the average (more in some cases, less in others) of 2d. an acre for six copies. If more are required they may be had for little more than the cost of the paper. Sir Charles Elton had ten, of which I used three; 2d. an acre will cover the expense of opening holes, and I should be satisfied with 6d. an acre for my time and trouble.

Analysis of Manures. — Professor Way transmitted the following note from Mr. R. H. Watson, of Dorsley, near Totnes, Devon, who had availed himself of the privilege enjoyed by members of the Society, of having analyses of guano and other manures made for them, by its consulting-chemist, at a reduced and very cheap rate:—

I beg to thank you for the analyses of guano and superphosphate received this morning, and shall, on their strength buy £100 worth. The cost I think well bestowed, looking at it as a sort of insurance of 2½ per cent., a bagatelle in comparison with the loss that would accrue from buying a spurious article when the money expense is not of so much importance as the loss of crops and its effects on the whole system for one year.

Mr. Hudson, of Castleacre, has also recently informed the Council of the great advantage he had derived from the test of chemical analysis, in the selection and purchase of manures; and of the money-loss (amounting to several hundred pounds), as well as of the disappointment he would have incurred, had he proceeded, without the aid of such unerring means for the detection of fraud, or the confirmation of genuine quality.

Lecture.—It was announced that Professor Way's absence for a few weeks on the continent, in reference to a professional inquiry involving many interests and much capital, would oblige him to postpone his communication to the members at a Weekly Council, on the subject of Town-Sewerage, from the 15th of June, as originally fixed, until Wednesday, the 29th June, at 12 o'clock.

The Council having ordered their usual acknowledgments for the communications then made to them, adjourned to their monthly meeting, on the first of June.

A Monthly Council was held at the Society's House, in Hanover Square, on Wednesday, the 1st June. The following members of Council and governors of the Society were present: Mr. Pusey, trustee, in the chair; Lord Berners, Hon. R. H. Clive, M.P.; Sir John Villiers Shelley, Bart., M.P.; Sir Thomas Dyke Acland, Bart., M.P.; Sir Matthew White Ridley, Bart.; Sir Charles Lemon, Bart., M.P.; Sir Robert Price, Bart., M.P.; Mr. Raymond Barker, Mr. Barnett, Mr. S. Bennett, Mr. Bramston, M.P., Mr. Brandreth, Mr. Buller (Dilhorne), Colonel Challoner, Mr. Druce, Mr. Gadesden, Mr. Brandreth Gibbs, Mr. Grantham, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hornsby, Mr. Jonas, Mr. Lawrence, Mr. Milward, Mr. Lennox Naper, Mr. Simpson, Mr. Slaney, Mr. Thompson (Moat Hall), Mr. Turner (Barton), Captain Henry Vyner, Mr. Jonas Webb, Mr. Wilson (Stowlangtoft), and Mr. Woodward.

Brice Pearse, Esq., of Ashlying Hall, Great Berkhampstead, Herts, and Upper Brook Street, London, was elected a governor of the Society.

Finances.—Mr. Raymond Barker presented to the Council the report of the Finance Committee, from which it appeared that the current cash-balance in the hands of the bankers was £2,208. He also laid before the Council the transfer voucher for the investment of £800 in the purchase of stock, ordered at their last monthly meeting.

Essay Prizes.—Mr. Pusey reported to the Council the prizes recommended by the Journal Committee for the essays and reports of next year, informing the Council of the specific grounds on which each subject had been selected. These details received the considera-

tion of the members present, and gave rise to interesting points of discussion; the following schedule being finally arranged:—

Farming of Durham	£50	0	0
Farming of Oxfordshire	50	0	0
Farming of Dorsetshire	50	0	0
Trunk Draining	50	0	0
Under Draining	30	0	0
Giddiness in Sheep generally	10	0	0
Autumn cleaning of Stubbles	10	0	0
Sewerage Matter as Manure	20	0	0
Classification and extirpation of Weeds	20	0	0
Any other Agricultural Subject	10	0	0
	£300	0	0

The respective conditions under which each of the essays and reports competing for these prizes will be required to be written, will be drawn up by the Journal Committee and made public; the essays and reports to be sent as usual to the Secretary of the Society on or before the 1st of March, 1854.

Gloucester Meeting.—Mr. Raymond Barker, Vice-Chairman of the General Gloucester Committee, reported the following recommendations:—

1. That the tender of Mr. Churchill, of Gloucester, for the supply of the Pavilion Dinner at the Society's ensuing Country Meeting, be accepted.
2. That the arrangements made by the General Gloucester Committee of the Society and the Local Committee of the City, in reference to remission of toll charges, be confirmed.
3. That the arrangements for the ensuing Gloucester Meeting do not allow of any opportunity by which the Society can avail itself of the kind offer of co-operation made to the Council, through Mr. Holland, on the part of the Committee of the Royal Agricultural College at Cirencester, and the Professors of that establishment.

Mr. Barker explained to the Council the particular reasons for which the kind services of the learned professors, thus placed at the disposal of the Society, would not only be unavailable, but from the circumstance of the occasion, would be unattended with that due amount of auditory, which would mark proper respect. It was well known, that at many of the former meetings, their own professors, after having prepared, as in the case of Professor Simonds at Lewes, elaborate and highly interesting diagrams illustrative of their subjects, had to deliver lectures which had cost them much labour and expense to prepare, to almost empty benches; while at Gloucester, the probability of such absence of members would be greater, on account of the greater distance of the show-yard from the public building in which the lectures would be delivered.

This report was then adopted, and the cordial thanks of the Council voted to the Committee of Management and the Professors at the Royal Agricultural College at Cirencester.

Steam Boiler.—Colonel Challoner, chairman of the Implement Committee, laid before the Council the agreement entered into by Mr. William Batley, of Bridge Street Works, Northampton, with the Secretary of the Society, for the construction of a portable 10-horse steam-boiler, for working the fixed steam-engines at the Gloucester meeting; agreeably with the specifications drawn up by the Implement Committee and the Society's Consulting-Engineer, and Mr. Batley's tender, which the Committee had unanimously accepted.

Judges.—The Council then proceeded to the selection and appointment of judges of live stock and implements at the Gloucester meeting; and having completed the lists, adjourned to that day fortnight, for the purpose of making any final adjustments that might at that time be required in them.

Lincoln Agreement.—The Agreement of the Mayor of Lincoln, on the part of the authorities of that city, with the secretary of the Society, on the part of the Council, that the country meeting of 1854 should be held at Lincoln, on the fulfilment of certain stipulated conditions, having been duly signed by the Mayor, and sealed in the presence of the Corporation with the great seal of that city, was signed at this meeting by the secretary, and sealed in the presence of the Council with the great seal of the Society.

The Council then adjourned to their weekly meeting, on the 8th of June.

A Weekly Council was held at the Society's House, in Hanover Square, on Wednesday, the 8th of June: present, Mr. Raymond Barker, V.P., in the chair; Right Hon. James Grattan, Sir M. W. Ridley, Bart., Sir C. Lemon, Bart., M.P., Mr. Burke, Mr. D. Burton, jun., Mr. Corrance, Mr. Darnbrough, Mr. Dyer, Mr. Freeland, Mr. Gadesden, Mr. Baskerville Glegg, Mr. Curtis Hayward, Mr. Fisher Hobbs, Mr. Manning, Mr. Orlebar, Mr. Parkins, Mr. Pocock, Mr. Rowlandson, Prof. Simonds, Mr. Spencer Stanhope, and Mr. Trench (Freehill).

Communications were received—1, from Sir Emerson Tennent, transmitting from the Board of Trade two copies of Prof. Bollman's Essay on the Preservation of Potatoes; 2, from the Imperial Free Economical Society of St. Petersburgh, copies of their published Transactions; 3, from Mr. Philip Bowes, of 26, King William Street, Strand, a copy of his Treatise on Farm Book-keeping by double entry; and from Mr. Grey Porter, a copy of his Farm Account Pocket-book; 4, from Mr. Harding, of Tern Hall, Market-Drayton, a set of his Plans for Dairy-farm Buildings, and a copy of his Address on Farm Improvements, delivered before the North Staffordshire Agricultural Society; 5, from the Rev. E. Benyon, copies of his Plans of Farm Cottages; 6, from Mr. Hornsby, statements on the subject of poison for rats and mice in farm homesteads; 7, from Mr. Hill Dickson, letters informing the Council of the completion of his Flax machinery at Grove Street, Deptford. The Council ordered their usual acknowledgments for the favour of these communications, and adjourned to Wednesday, the 15th of June.

An adjourned Meeting of the last Monthly Council having been held at the Society's House in Hanover-square, on Wednesday, June 15, for concluding the arrangements for the appointment of Judges of Implements and Stock at the Gloucester meeting, it was followed by an ordinary Weekly Meeting of the Council; present, Lord Ashburton, President, in the Chair; Lord Berners, Lord Camoys, Hon. John Jervis Carnegie, Hon. R. H. Clive, M.P., Sir Thos. Dyke Acland, Bart., M.P., Sir M. White Ridley, Bart., Sir Montague Cholmeley, Bart., Mr. Raymond Barker, Mr. Hodgson Barrow, M.P., Mr. Burke, Mr. D. Burton, jun., Dr. Calvert, Mr. Cavendish, Mr. Des Vœux, Mr. Druce, Mr. Dyer, Mr. Gadesden, Mr. Garrett, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Cuthbert Johnson, Mr. A. G. Jones, Mr. W. Jones, Mr. C. Lawrence, Mr. Maning, Mr. Orlebar, Mr. Chandos Pole, Mr. Porter (Hembury Fort), Mr. Pugh, M.P., Mr. Rowlandson, Prof. Simonds, Mr. J. E. Thomas, Capt. Henry Vyner, Mr. Jonas Webb, and Mr. Yorke.

Agricultural Geology.—The President laid before the Council various communications, addressed to him by Mr. Trimmer, in reference to the establishment of a Lectureship on Agricultural Geology. The communications having been read, a general opinion was expressed by the members present that, whatever might be their different views of the extent of benefit to be derived to agriculture from abstract geological knowledge, there was no one who, from his experience of superficial deposits, was better qualified than Mr. Trimmer for the practical department of Agricultural Geology. Lord Berners bore particular testimony to the value of Mr. Trimmer's knowledge in supplying him with most interesting and useful advice in reference to his lordship's own property in Leicestershire; the President considered that courses of lectures on surface-soils and deposits near the surface would furnish much aid in improving the fertility of particular districts; and Mr. Rowlandson dwelt on the especial necessity, in all cases of soils, of having a chemical as well as physical examination made of their peculiar properties.

Foreign Agriculture.—Communications having been laid before the Council from the Georgofili Society of Florence, and the Imperial Agricultural Society of Valenciennes, conveying an intimation from each of those agricultural bodies of their wish to transmit to the Society their published transactions, and written information of the occurrence of interesting facts in agricultural science and practice, it was resolved unanimously, on the motion of the Hon. R. H. Clive, M.P., seconded by Mr. Jonas Webb, that each of those institutions should be placed on the list of Corresponding Societies, and the Journals forwarded to them accordingly.

Mr. Harriott exhibited to the members a model of his Pulverizing Clodcrusher and Presser; and M. Terwangne, of Lille, transmitted an account of his work on the treatment of textile plants; including comparative analyses of the products obtained in the processes of Schenck, Watts, and Delisse; and an account of his own process by means of rural machinery, and preparations for the treatment of flax and hemp.

The Council ordered their usual acknowledgments for the favour of the communications then made to them, and adjourned to the 22nd of June.

A Weekly Council was held at the Society's House, in Hanover-square, on Wednesday, the 22nd of June: present Lord Ashburton, President, in the chair; Lord Bridport, Hon. R. H. Clive, M.P., Sir John Villiers Shelley, Bart, M.P., Sir M. White Ridley, Bart., Mr. Raymond Barker, Mr. Burke, Dr. Calvert, Mr. Gadesden, Mr. Baskerville Glegg, Professor Henfrey, Mr. Fisher Hobbs, Mr. Cuthbert Johnson, Mr. C. Lawrence, Mr. Majendie, Mr. Orlebar, Mr. Parkins, Mr. Chandos Pole, Prof. Simonds, Mr. Aug. Smith, Mr. Spencer Stanhope, Capt. Vyner, Prof Way, and Mr. Wilson (Stowlangtoft).

Communications were received—1, from Mr. Shepherd, of the Imperial Russian agency, on the trial of sewage manure; 2, from Mr. Kirkwood, requesting information on model farms, implement manufacturers, and standard works on agriculture published previously to 1840; and 3, from Mr. Woodcroft, requesting information on reaping-machines.

Reports were received by the Council to the following effect:—1, that the Chairman of the *Journal* Committee had communicated the final arrangements made for the new number of the *Journal* of the Society, and its immediate publication and distribution; 2, that the lists of Judges for Live Stock and Implements at the Gloucester Meeting had been satisfactorily completed; 3, that all the railway companies to which the Council had made application in favour of the Society's exhibitors, at its ensuing country meeting, had granted the usual liberal concessions of a free transit of live stock, and a reduction of half charges on implements to and from all parts of England and Wales to Gloucester; 4, that the show of live stock at the Gloucester Meeting would be unusually large and interesting, the space required for the exhibition of agricultural implements and machinery (as already reported) amounting to an area 6¾ yards in width and one mile in length; 5, that Professor Way's statement on town sewage and its agricultural applications would be delivered before the Members at the Weekly Council to be held at the Society's house in Hanover-square on Wednesday, the 29th of June, at 12 o'clock.

The Council then adjourned to their next Weekly Meeting.

NEW MEMBERS.

The following new members were elected:—

Anderson, Robert A., Cirencester
Angerstein, William, Melmarsh Hall, Market-Harboro'
Asplin, Charles, jun., Little Wakering Hall, Essex
Bagnell, Thomas, Great Barr, Birmingham
Banks, Edward R. R. G., Sholden Lodge, Deal, Kent
Banks, William J., Oxney Court, Dover
Bayden, Thomas, Brookland, New Romney, Kent
Bower, Edward, Closworth, Sherborne, Dorsetshire

Brooke, John, jun., Capel, Ipswich, Suffolk
Burbery, Samuel, Wroxhall, Warwickshire
Clayden, Samuel, Linton, Cambridgeshire
Coke, Hon. Edward Keppel, Longford Hall, Derbyshire
Crosskey, Swanwick, Southampton
Davis, James, Melcombe, Horsey, Blandford
Dixon, James, Westbrook Place, Bradford, Yorkshire
Drinkwater, Henry, Sandhurst, Gloucester
Dyke, Thomas, Monmouth
Evans, Samuel, Ottery St. Mary, Devonshire
Franklin, Willingham, Haselbeach Hall, Northampton
Gillett, John, Brizenorton, Bampton, Oxfordshire
Goodfellow, Thomas, Tunstall, Staffordshire
Harvey, Burton Blyth, Worth Hall Farm, Crawley, Sussex
Hayward, Charles Brombil, Margam, Glamorganshire
Henfrey, Arthur, Lecturer on Botany at St. George's Hospital
Humphris, Henry, Sandford, Charlton-Kings, Cheltenham
Humfry, William, Oakash, Chaddleworth, Wantage, Berks
James, James, Haverfordwest, Pembrokeshire
Leaver, Francis, Lougnor Hall, Penkridge, Staffs
Lovegrove, Samuel, Churchdown, Gloucester
Lovegrove, Joseph, Gloucester
Mackintosh, Agnew, Geddes, Nainshire, Scotland
Middleton, John, Lincoln
Pell, Paul Mildmay, High Sheriff of the county of Brecon
Perkins, Thomas, Hitchin, Hertfordshire
Salkeld, Thomas, Holme Hill, Carlisle
Seacome, Henry, Stapleford, Chester
Sims, W. D., Ipswich, Suffolk
Skillecorne, William Nash, Cheltenham, Gloucestershire
Steed, John, Baldock, Hertfordshire
Terry, Edward, Aylesbury, Buckinghamshire
Thomas, Morgan, Gatehouse, Hurstgreen, Sussex
Todd, John, Mireside, Wigton, Cumberland
Tyacke, James, Bonallach, Constantine, Cornwall
Tyacke, John, Merthew, Constantine, Cornwall
Tyler, John, Layton, Essex
Vaughan, William Brettell, Burway, Ludlow, Salop
Waldrond, John Waldrond, Knight's Hayes, Tiverton, Devon
Walter, William, Haverfordwest, Pembrokeshire
Washbourne, Charles, Gloucester
Wilkins, James, Corse, Gloucester
Winton, Harry, Holly House, Erdington, Birmingham
Whinyates, Colonel, C.B., Royal Horse Artillery, Woolwich.

THE LATE EARL OF DUCIE.

Judicious patronage, or rather encouragement, has already done much for agriculture. It requires, however, something more than the mere strength of a man's purse to effect any real or lasting good. In no calling, either, is an intimate acquaintance with that we are dealing with more necessary than when interfering in, or attempting to direct, the course of rural pursuits. The attendance at a meeting, the payment of subscription, and the offer of a premium, do little of themselves: and yet, with the observance of such duties, how many of our great landowners are content to rest satisfied! Obeying the summons to appear, proposing the toast, and drawing the cheque—and then thinking no more of the matter until next year or next gathering. Such passive aid as this, we repeat, is comparatively of little service. We want something beyond the mere countenance or name of a patron at the head of our list. His heart and best sympathies should be with us, or his cheer falls as empty and as hollow as it is given. Let us only know that he feels himself something of an interest and pleasure in the matter his position may prompt him to support, and we may go with him as readily as we see he is wishing to go with us. Let us know that his advice is grounded on his own experience, and we shall be far more inclined to attend to it. Let us feel that his assistance comes as the volunteer of his own tastes, and we shall be far more able to appreciate it. When the owner of the soil identifies his interests with those of the occupier, it should be on somewhat stronger grounds than the cold sense of a duty; at least, if either is to profit much by the alliance.

Assuming the correctness of these impressions, we cannot but believe that, in the death of the Earl of Ducie, agriculture has lost one of its best and truest friends. With the power to do much he united an innate passion for the pursuit, and an extraordinary energy in carrying out his intentions. Those who have seen him of late years, struggling with, and at times almost mastered by disease, but yet still ever active in the cause to which he had especially devoted himself, will feel the more on consideration how much we owe to him. The career of the Earl of Ducie as a practical agriculturist will long stand as an example for both landlord and tenant—showing to the one how the duties of his station really should be fulfilled; and conveying to the other, a lesson of how much a proper spirit of enterprise and earnestness may accomplish.

And yet this career was commenced and almost completed without any encouragement from those to whose advancement its object was directed. The isolated position his Lordship took as a large landed proprietor when the repeal of the Corn-laws came to be discussed placed him in open antagonism with the majority of the agricultural world. Never either did party feeling develop itself in a more bitter spirit; and hence, not only while the contest raged, but even long afterwards, were Lord Ducie, his improvements, and his incentives to advance, regarded generally with the strongest suspicion and most unfavourable bias. Everything he did or

advised was interpreted simply as but another step in that direction it was held most unadvisable to take. His experiments were ridiculed, his best intentions misconstrued; and when he sought most to promote the interest of agriculture, he was judged most to be promoting the interest of something hostile to it.

The greatest difficulties, however, are nothing to a man conscious of his own good intentions. Lord Ducie's heart and sympathies were in the cause he had associated himself with; and thus, heeding as nought the passing commentary, he persevered until the evil report became a good one. Happy are we to record that, ere his premature and much-to-be-regretted decease, his lordship did enjoy the highest honour, perhaps, in this country the patron of agriculture can succeed to. Within one year of this career being closed, he crowned it as President of the Royal Agricultural Society of England. Need we repeat here how ably he filled that office—how assiduously, despite the declining state of his health, he attended to its duties, or how clearly he looked to, and how boldly he spoke to the best interests of the Society? We believe it to be generally admitted that we have had few better in that chair, and we know that we have none whose efforts have done more to deserve the honours it conferred.

We consider it would be but superfluous here to enter into any details of what these efforts conduced to; the more so as a memoir of his Lordship, accompanied with a portrait, appeared in the *Farmer's Magazine* of July last. To this we would refer such of our readers as have yet to learn the real object with which the experimental farm was started, the implement works at Uley established, and other similar undertakings uniting "practice with science" entered upon. In another direction, the celebrity of his stock—of his shorthorn cattle more particularly—is equally well known, and himself renowned for the spirit and liberty which he sought to perfect the breed. To a district but too commonly known for the stand-still character of its agriculture were these efforts chiefly directed; and this district, moreover, embracing the greater part of his Lordship's property. The force of some such example was in every way wanting, while from none could it come with more propriety or effect. It was well done, too, as most of us, by this, will be ready to allow. What once read but wild and visionary, is now come to be considered as earnest, and even well-grounded. Under any circumstances, the least that could be said of Lord Ducie's exertions would be that they were well intended. They have had fortunately a more becoming result; and as we hold them out for the imitation of others enjoying his rank and means, we do so with the conviction that few will have to contend with anything like similar difficulties in arriving at them. We should wish it to be understood that we are in no way identifying ourselves with anything that may have given rise to these impediments; and we only mention them to show how, at one time, they caused his lordship's labours to be something more than misunderstood.

The Earl of Ducie died on Thursday, June 2, after a long illness, having only just completed the fifty-first year of his age. His Lordship married, in 1826, the Honourable Elizabeth Dutton, eldest daughter of Lord Sherborne, by whom he has left a family of fourteen children, four daughters and ten sons. The eldest of these—Henry John Lord Moreton, returned for Stroud at the election in 1852—succeeds to the title.

THE HAY HARVEST.

It is almost impossible to produce any new idea upon this well-digested subject; so much has been written, and so well written, upon it, that my task will be to condense within my usual limits the most valuable suggestions thereon, and to point out the best mode of making and harvesting "hay."

To insure a good crop of hay, it is requisite to "lay in" for mowing as early in the season as possible, particularly the artificial grasses; these generally comprise only one variety—broad clover, for instance; and as all the plants grow nearly alike, they will be ready at the same time for the scythe. Not so meadow hay. The various grasses comprising meadow hay have their peculiar seasons of growth, some earlier, others later; and the chief care is to ascertain when the greatest number of the most valuable grasses are in full flower, as that is the precise time to commence *mowing*, because plants of nearly all sorts, *if cut when in full vigour*, and afterwards carefully dried without any waste of their nutritive juices, contain nearly double the quantity of nutrition which they do when allowed to attain their full growth, and make some progress towards decay. To retain these nutritive juices, and to remove deleterious moisture from the grass is the process of haymaking; and that mode of making hay which tends best to remove such moisture, and "retain the soluble portion of grass in perfect integrity," is to be adopted.

Mowing.—This operation should be performed as evenly as possible, and the cutting must be close to the ground, as the lower portion of the grass pro-

duces a much greater weight of hay, than the top and it also greatly facilitates the quicker growth and prosperity of the eddish or aftermath.

Haymaking.—This process must depend very much upon the state of the weather; if showery or wet, the less the grass is disturbed after mowing the better, as it will lie in a compact swathe several days without serious hurt; but if thrown abroad in wet seasons, the soluble salts and other matters are soon washed away—rather wait for a genial season. If the weather is fine, too much energy cannot be used; the grass should be tedded (shaken about) immediately after the mowers, for which purpose a "tedding-machine" is best and cheapest; but it may be very effectively done by haymakers with forks, taking care to separate every heaps of grass, and spread all equally over the field. Towards evening all the grass which has been spread abroad during the day should be in some way or other thrown together, to protect it from heavy dews or slight showers in the night, as it is very essential that it retain its fine, light green colour; whereas, if not thrown together, it soon becomes bleached. There are many expeditious ways of getting it together, "wind-rows," "foot-cocks," "grass-cocks," &c. The first may be gathered into rows, "wind-rows," by a very long-toothed rake, drawn by a horse across the field, and leaving a "rake-full" at intervals; or by a bout to bring it together in larger rows; or it may be done by haymakers working after each other, and throwing in the grass or hay till it accumulates into "wind-rows," about 4½ feet wide, and 2½ feet high; or it may be forked into a great number of small heaps, called "foot-cocks," or again into larger heaps called "grass-cocks;" the former is best for night dews, and is more expeditious; the latter modes are preferable in unsettled weather. If the weather is favourable, as soon as the dew is dispersed on the following morning, muster all the available force requisite, and proceed to throw out the grass, and if need be, apply the tedding-machine again, and other frequent shakings, so as to get the most benefit from sun and wind; after this is done, and while this portion is drying, proceed in the same way with the grass newly mown, and this day by day. If the day has been hot and drying, the grass of the first day will now be ready to make into small "hay-cocks;" it should be thrown into "wind-rows," and put together by hand into hay-cocks, each containing some half dozen good fork loads. In the following morning, if fine, these should again be thrown out, and rather thickly strewn about in the direction of the wind-row, and be well shaken over. In the evening, if the day has been hot, it will be *well-made hay*, and may be safely secured into large hay-cocks by horses, which is thus done:—The wind-row being well thrown in, a horse going on each side of it, dragging a rope which passes around the end of the row, a man rides on the rope after each horse, to keep down the rope and aid in the accumulation. The hay thus readily drawn together, rises up between the men, and when they have a sufficiency to form the cock, they adjust the rope; the hinder part is drawn upon the former, and generally a large well-formed hay-cock is the result; other hands follow to make up, and trim it so as to prevent the rain from entering; these cocks, well made up, will keep dry a considerable time, and are well worth attention in a busy season.

Should the weather be all the haymaker can desire, the simpler the course the better. No golden rule can be pointed out. He must remember that rain and dews deprive his hay of its soluble salts and nutritive matters. That too much moisture will cause fermentation or heating in the stack, which will destroy its valuable saccharine quality, and also cause great injury by turning it mouldy. If hay is repeatedly wetted and dried, it is permanently injured; great care is necessary on this point; in showery weather it is advisable to let the swathe lie several days till the bottom is really suffering loss, and then carefully turn it over, keeping it close together till a favourable change takes place. Should, however, all be in vain, and the hay cannot be secured in fair order, it may be improved in stacking by adding alternate layers of sweet straw as the stacking proceeds; salt at the rate of one peck to a ton of hay is recommended as tending to check fermentation, by being sown over the stack. This I have found to turn the hay damp in wet weather. A little carraway seed thrown over this hay when given to horses or cattle aids in its consumption. The foregoing remarks apply chiefly to old meadow-land hay; more time and greater care are requisite in making hay from fresh meadows or old lands highly manured: the herbage is stronger, more succulent, and possesses more saccharine quality, and if good judgment be not used and plenty of field room given, much heat is sure to generate in stack.

Stacking.—This requires great care and judgment. Stacks should not be made too large if the hay is well made and retains its nutritive properties; large stacks are almost certain to generate heat, unless the hay is deprived of every good quality, and is valueless. If the hay cannot be got into good order, but must be put into stack, it is very desirable to draw up a skep or stuffed sack from the very bottom to act as a chimney or ventilator, to allow the escape of superfluous moisture. Stacks of moderate size are to be preferred. They soon cease to heat, and may then be thatched and made safe. All large round stacks should have a chimney or ventilator. Oblong stacks, if not too wide, may generally be made without ventilators. These ventilating chimneys should

invariably be covered before the whole heat of the stack passes off; the retention of some heat improves the hay around these chimneys. In fine seasons all the force of the farm should be brought to bear upon the stacking, as so much depends upon the hay being properly secured—it is the farmer's dependence for the provender of his horses and cattle during winter, and renders the hay harvest to him one of the most important periods of the year.

P. F.

METEOROLOGICAL DIARY.

	Barometer.		Thermometer.			Wind and State.		Atmosphere.			Weat'r.
Day.	8 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
May 24	30.03	29.90	48	65	52	East	strong	fine	sun	fine	dry
25	29.78	29.63	52	65	56	E. by North	strong	fine	sun	fine	dry
26	29.63	29.61	43	73	56	S. West	nly.cm.	fine	sun	fine	dry
27	29.65	29.70	51	73	56	Every way.	calm	fine	cloudy	cloudy	rain
28	29.71	29.75	51	59	48	S. Westerly	fresh	fine	cloudy	cloudy	rain
29	29.85	29.92	45	63	50	W. or by South	gentle	fine	fine	fine	rain
30	29.99	30.09	45	61	52	Easterly	var.	fine	sun	fine	dry
31	30.02	29.98	50	56	51	Easterly	brisk	cloudy	cloudy	cloudy	dry
June 1	29.96	30.	48	57	50	Northerly by E	gentle	cloudy	cloudy	cloudy	dry
2	30.06	30.13	48	60	50	Northerly by E.	fresh	haze	hazy	cloudy	showery
3	30.17	30.17	47	63	48	Northerly by E.	gentle	cloudy	sun	fine	dry
4	30.06	29.96	41	60	48	Northerly by E.	var.	cloudy	cloudy	fine	dry
5	29.96	29.90	47	67	51	S. Westerly	gentle	fine	sun	fine	dry
6	29.90	29.88	41	73	55	Variable	calm	fine	sun	fine	dry
7	29.99	30.05	47	70	58	N. West	gentle	fine	sun	cloudy	dry
8	30.10	30.10	49	74	59	S. West	fresh	fine	sun	cloudy	dry
9	30.10	30.	55	70	59	W. by S.	gentle	cloudy	fine	fine	dry
10	30.	29.85	54	73	60	E. by South	lively	cloudy	sun	cloudy	rain
11	29.80	29.76	58	78	59	Various	var.	fine	sun	fine	rain
12	29.76	29.77	52	68	56	W. by North	gentle	fine	sun	cloudy	rain
13	29.79	29.76	49	56	49	Westerly	gentle	cloudy	cloudy	cloudy	wet
14	29.89	30.	48	63	55	Various	gentle	fine	cloudy	fine	showery
15	30.42	30.02	51	67	56	S. West	var.	fine	cloudy	cloudy	showery
16	30.02	30.02	53	70	58	Southerly	gentle	fine	sun	fine	dry
17	30.06	30.06	50	67	57	S.S.W.	lively	fine	sun	fine	dry
18	30.02	29.94	51	67	56	S. West	brisk	cloudy	fine	cloudy	dry
19	29.77	29.62	51	62	50	Southerly	brisk	cloudy	cloudy	fine	showery
20	29.62	29.58	45	65	58	W. by N., var.	lively	fine	sun	fine	dry
21	29.58	29.71	45	62	48	Easterly, var.	var.	fine	cloudy	fine	showery
22	29.77	29.73	45	68	55	Northerly	lively	fine	cloudy	fine	showery

ESTIMATED AVERAGES OF JUNE.

Barometer.			Thermometer.		
High.	Low.	Mean.	High.	Low	Mean.
30.46	29.60	30.02	90	37	56.7

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
65.83	48.67	57.25

Weather and Phenomena.

May 24 and 25. Continuance of the forcible east current. 26. Hot and hazy. 27. Same, oppressive. 28. Thunder, and much rain—changeable. 29. Showers, with some thunder. 30. Generally fine. 31. Cold and winterly.

Lunation.—Last quarter, 29th day, 5 h. 39 m. afternoon.

June 1. Overcast and cool. 2. Gloom, showery. 3. Fine; keen air. 4. Some clouds; fine. 5. Completely genial. 6. Close; some thunder-like clouds. 7. Hazy; smoky-like clouds about noon. 8. Lovely day; evening with small cumuli. 9. Overcast. 10, 11, and 12. Mere hints of rain; thundery masses occasionally. 13. Quite wet. 14 and 15. Growing shower on each. 16. Fine. 17. Same. 18. Changeable. 19. Showers. 20. Sunny. 21 and 22. Changeable; showers; a fine rainbow on the 21st.

Lunations.—New moon on the 6th day, 8 h. 3 m. afternoon. First quarter, 14th day, 3 h. 27 m. afternoon. Full moon 21st day, 6 h. 36 m. morning.

Remarks connected with Agriculture.—Wheat first observed to develope the ear on the 9th; oat-spikes seen also; subsequently the warm days and showers have produced great advances. Fodder crops are prodigiously heavy. Hay-making began on the 11th; a vast crop, but somewhat retarded by frequent showers. A return and continuance of warm sunny weather would render the crops heavy and early.

Croydon. J. Towers.

CALENDAR OF AGRICULTURE.

In the eastern parts of England, the sowing of turnips is mostly done this month, as the fly is not so prevalent as in June, and that the later sown turnips are not so liable to be mildewed. Sow the turnips as directed last month. Horse-hoe and hand-hoe potatoes, beet, and the earliest sown Swedish turnips; and repeat the operations, that no weeds appear. Use Morton's expanding scuffler, on the principle of the parallel ruler, which sets the face of the cutters always straight forwards; it takes a good hold of stiff soils. The young plants derive much benefit from the stirring of the intervals of the drills, and the most in dry weather; it causes an evaporation of moisture, which is imbibed by the leaves.

Get on with the ploughing, harrowing, and rolling of clay fallows for wheat; pick off every weed and stone, and get ready the dung and lime that are intended to be applied.

Proceed with draining, both on grass lands and on fallows. Finish the latter as quickly as possible, in order not to impede the working of the land. Draining of land while in a state of grass is very much preferable; the neatness with which the work can be executed will amply compensate for any extra cost in cutting, arising from the hardness of dry weather. But the proper course of all drains should be marked in winter, when every wetness shows itself.

Wean the latest lambs, and give them the best encouragement. Put mares to the stallion regularly. Attend that the pasture fields have a supply of water, and see that no gaps are continued in the fences. Apply the contents of the dredging box to the sheep, to prevent the maggot-fly depositing its larvæ. Dress clean the posterior parts of the animals, from the adhesion of excrements.

The hay season will be ended this month; make dry and carry the grass quickly, build it in long ricks, lay it lightly together, and allow it to settle by its own weight. It is a mistake to tread it firmly together. Pull nothing from the sides of the ricks till it be well settled; then dress it into any form, and thatch it without delay. For the purpose of getting up the hay to a high rick while building, use a scaffolding raised on four upright posts, resting below on a four-wheeled platform, and elevate or lower the scaffolding by means of pulleys to any height that may be required; lay some loose straw on the extreme top of the rick till it be thatched. When the hay is damaged by rains, mix salt in the ricks as before directed. When the building of hay-ricks is interrupted by the intervention of one or more nights, spread over the rick a waterproof tarpaulin cloth, which will defend it from rain; remove it in the early morning, to let the sweating of the grass escape. To defend the rick from day showers, suspend over it a light cloth, by means of a rope passing the length of the rick, and attached at each end with an upright pole.

Harvest will commence this month in early situations. Early peas, barley, and rye will be first cut; tie the barley and rye into sheaves, and set them in shocks of twelve sheaves each; lay the peas in small heaps, and turn them frequently. Carry the grains quickly when dry; have rick stands ready and barns cleared out.

CALENDAR OF HORTICULTURE.

General Remarks.

Not the least important duty, and certainly not the least expensive one at this season of the year, is the well-keeping of the lawn. Warm showery weather occasions the grass to grow so fast, that unless some means be taken to keep it properly down, it soon becomes unsightly; and, notwithstanding the skill of a Budding and a Shanks has presented us with mowing machines, yet it is only in very few cases that these auxiliaries have proved really useful, so that, after the few trials they have had, it is no uncommon thing to hear of their being laid aside. Now this is disheartening to the uninformed, for most persons prefer buying an article of confirmed utility to one of a doubtful nature We think it desirable, therefore, to invite parties who have really efficient machines in use, to come forward and explain what they are; neither should the unsuccessful be backward in proclaiming their failure, for both are alike useful. We would also invite the ingenious to consider if improvement cannot be made in these machines, and to what extent. We often hear of new implements paraded forth as possessing marvellous powers, when their uses are, after all, confined to some minor or subordinate duty. But this is one of great importance; and where short grass to the extent of some ten or a dozen acres has to be kept in order, it becomes important to inquire if no better method than mowing it by the scythe weekly has yet been or can be found out.

Plant Houses.

Conservatory.—Remove Geraniums and Calceolarias that show symptoms of having done their best—the

former into an open situation, the latter to a shady damp one, as the north side of a high wall or building, and there let the plants be plunged in something that will keep them as cool as possible; if coal ashes be used, they may frequently be watered with cold spring water, which will in a general way supply through the pot most of the moisture the plants require. A top dressing of leafy matter will also be necessary; and if the plants are expected to be propagated from, the flower stems ought to be cut down before they ripen seed, or, in fact, before their beauty is gone. Keep the house supplied with other plants, of which there is great variety now coming into flower —as Fuchsias, Balsams, Achimenes, Gloxinias—to say nothing of the long list of hard-wooded plants so generally used for this purpose. Avoid syringing where there is any flowers; but where the foliage can be sprinkled over without wetting the bloom let it be done at once. Keep all enemies in the insect way at defiance, and let neatness prevail everywhere.

Greenhouse.—So many of the usual inmates here having been set out of doors lately, more room will be left for those remaining; to these the necessary tying and training may be given as the plant advances in growth, only bearing in mind that the principal secret in such training is to conceal the means used, as well hereafter as at present; avoid, therefore, all stiffness, and let the plants have a little of their natural freedom of growth. Give additional room, both at top and root, to such things as require it, taking care that plants which have been recently potted do not become overwatered. Propagate most of the kinds from slips of the current summer's growth; and where old plants have become unsightly, let them be removed, and young ones introduced in their place. Keep a healthy atmosphere by frequently sprinkling the floors and other vacant spaces with water; and give a due regard to the preparation of plants for future duration, not forgetting the Chrysanthemum; while all annual and other fast-growing plants must be potted and otherwise attended to as required.

Stove.—Abundance of air and a sufficiency of moisture must be supplied to this house, in order to prepare the varieties for that position out of doors which we think most of them ought to have next month. Bring forward Gloxinias, Gesnerias, Achimenes, and other semi-bulbous plants in bottom heat, with abundance of top air, and a compost rendered rich by copious watering with liquid manure, more especially where the plants have attained some size.

Forcing Department.

As the season may be fairly supposed to have arrived at that point in which fires and the other modes of supplying heat (except of a bottom kind) may in a measure be dispensed with, we will not enter into detail on this department now, but refer our readers to former calendars, and urge on them the propriety of keeping up a condition of good health in the various things here cultivated, and also to meet any advances of insects or mildew with prompt measures for their annihilation; and to endeavour, as far as possible, to maintain order and neatness here as well as elsewhere.

Flower Garden.

The most attractive feature here will be the Roses, which, if good, and measures have been taken to keep them clean, ought now to have a gay appearance. Take notes of the best, not only in your own garden, but also in those of others whom you may visit; and in regard to improving your own stock, rather look to the habit and character of the plant in its growing state, than to the truss of bloom which may be exhibited at a horticultural show. Budding may also be performed, and all the suckers from worked stools cleared carefully away. Examine the various bedding-out plants, and peg down Verbenas, Anagallis, and, for a time, Petunias; but after the latter cover the ground, it is good practice to stick some short feathery sticks amongst them, about six inches high; these will speedily be overgrown, and prevent high winds breaking and disturbing them so much as they otherwise would do. A similar protection, or something in that way, must be given to the beds of Calceolarias of the Amplexicaule section, which are otherwise apt to get broken at the neck: some little attention must previously be given to them, in order to induce them to lie down the right way. Tom Thumbs and Mangels's variegata require but little attention; but the large kinds of scarlet, as Emperor, Giant, Mrs. Maylor, Shrubland, and others, require some support. Keep the grass frequently mown, and the walks clean and often rolled, and the edges of beds in that trim order which in no small degree assists to set off their contents. Put in pipings of Pinks and Carnations, not forgetting that old, yet ever useful kind, Anne Boleyn. Examine beds of Neapolitan and other Violets, and where any traces of red spider exist, let them be dusted with a mixture of soot and sulphur. Cuttings, or rather rooted offsets, of these may yet be put in, if the weather is dull; but to have good plants for winter flowering, it will be better to select some of the older ones, and cutting away all runners, both now and as they appear afterwards, give them that fair chance to form buds and make specimens, without which they are useless for winter forcing. Tie up the various herbaceous plants needing it and give the whole that trim (yet not stiff) dressed appearance, without which at this season no garden can be said to look well.

Fruit Garden.

On several sides we hear of bad crops of Peaches and Nectarines, as well as Apricots, accompanied in some cases with trees in a bad condition from the attacks of insects, blight, and the other evils these fruits are subject to in early summer. In our own case the crop is certainly not good, but the trees are tolerably healthy; and we warn our gardening friends against that system of overcropping their wall borders, which has really more to do with the crop than many are willing to believe; but the temptation to have the use of such border, for early crops is so strong, that many think themselves compelled to avail themselves of them. But they may buy their services at too high a price. However, if they must be made to serve such a purpose, let them be generously treated, and immediately an exhausting crop of early peas or cauliflowers are removed, let them be well watered with liquid manure, and do not

place another crop on them during the season, and dig only slightly, adding dung of a very rotten kind; what would be still better, rich maiden loam, taking away as much of the exhausted part. Look over Pear trees, and nip off the tops of all shoots that are wanted to form fruit-buds at their bases. Remove useless suckers from Raspberries, and Strawberries must be preserved from birds and other vermin, as well as Cherries; the latter are so especially the objects of attack on the part of birds, that a very fine netting must be used to exclude them, with frequent watching, &c. Gather small fruits carefully, as required, and take notes of any of more than ordinary merit, and be sure to lay in a sufficiency of Strawberry layers, for forcing purposes, into pots—of which many prefer the smallest for this purpose.

KITCHEN GARDEN.

Here various crops, as Lettuce sown where it is to remain, Turnips, and French Beans, may be thinned where they grow robust, and less than six inches apart. Onions and Carrots, we suppose, already done. Sow a few more of the latter to draw young, and sow more Turnips, Endive, Lettuce, Peas, for a late crop, on some cool place; and plant out Celery, Broccoli of various kinds, as well as Cauliflowers, and even Lettuce, on a north border. Hoe and clean all vacant spaces, and stir the earth amongst growing crops, and stick Peas and Scarlet-runner Beans. Train out the vine of ridge Cucumbers from under the glasses, and peg them down; as also the same to Vegetable Marrow, &c.; and let the kitchen garden have the same dressed appearance as the more ornamental parts have; for, at this season, the absence of most large untidy crops renders this department more attractive than at others, and its keeping ought to be in accordance. N.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR JUNE.

From nearly all parts of the United Kingdom very favourable accounts have come to hand respecting the appearance of the wheat crop. Even in the most backward districts it has progressed rapidly; whilst in some quarters the plants have shot into ear, and in others they are nearly in bloom. Comparatively speaking, therefore, we do not consider the present a backward season; on the contrary, it is sufficiently advanced for the purposes of the farmer. The fine rains have had a most beneficial effect upon barley, which at one period was looking rather unpromising. Oats are progressing remarkably well, and both beans and peas, as well as rye, promise a good return. Of course it would be impossible for us to predict with any degree of certainty as to the extent of the yield of this year's crop of wheat; but judging from the present appearance of the fields, we are of opinion that the acreable produce will be a large one; nevertheless, it is evident from the limited quantity of land under wheat culture, that the aggregate yield will fall short of last year; hence it follows that it will be necessary for us to import more extensively than in many preceding seasons. From this circumstance, many parties have inferred that prices will be rapidly on the advance, and, as a consequence, have held back portions of their supplies. No doubt there is plenty of room for an improvement in the value of wheat; but it cannot be denied that the foreign producers are in a position to inundate our markets with almost unlimited supplies.

We have heard it asserted that the stocks of home-grown wheat in the hands of the farmers are seasonably good. That they are somewhat in excess of some former seasons no doubt can be entertained; nevertheless, a large portion of the supply is unfit for millers' purposes without a larger admixture of dry foreign.

The fine rains have been productive of a very large quantity of grass in the pastures; hence the stock has fared extremely well, and we may intimate that its general health has continued satisfactory.

For wool, both English and colonial, there has been a good demand, and prices have been well supported. Some of the English flock-masters have refused to sell except on higher terms; but we rather doubt the policy of such a step, because it is now well ascertained that the imports from our colonies and elsewhere—though their condition is by no means first-rate, arising from the high value of labour in Australia having prevented the flocks being got up so well as usual—will prove quite equal to the wants of our manufacturers. The public sales held in the course of the month went off rather slowly, yet the whole of the colonial parcels offered found buyers on former terms.

The imports of guano have amounted to about 17,000 tons, almost wholly from Callao. This article in the early part of the month was in brisk demand; and Peruvian, in second hands, could not be purchased under from £11 to £12 per ton. Since then, however, as the season is drawing to a close, the demand has fallen off, and the quotations have given way £1 per ton, without leading to any accumulation of stock. This year's arrivals have fallen considerably short of last year.

The cattle markets have been but moderately supplied. The consumption having increased, the demand for each kind of stock has ruled active,

and prices have continued on the advance. It is stated in well-informed quarters, that the supply of sheep in the country is decidedly small. Store animals have been held at unusually high figures.

In Ireland and Scotland the corn trade has been by no means active, yet the quotations have slightly improved. The stocks of foreign grain are represented as limited.

Hay-making has been commenced in the neighbourhood of the metropolis. The quantity of hay carried up to this time has been small; but we perceive that the produce is likely to turn out a most abundant one.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The rapid extension of our home and foreign trade, and the increased demand for labour in the manufacturing districts and elsewhere, have had the effect we predicted in the early part of the year; viz., an improved value for each kind of fat stock. Since we last wrote, the supplies of beasts on sale in the leading markets in England have been seasonably large, and in excellent condition; nevertheless, the transactions have been on the increase, and prices have had an upward tendency. In Smithfield, larger numbers of buyers have been in attendance from distant localities, who have purchased extensively, at prices which have rather surprised us, considering the expenses consequent upon the transmission of stock from one to two hundred miles per railway. We observe that a writer in the *Mark Lane Express* has alluded to the sales of stock effected in Smithfield some time since *by weight*, and has described the system as a novelty. In order to disabuse his mind on this point, we may intimate that such sales have been very common during the last twenty years, and that they have resulted not from custom, but merely from a difference of opinion between the salesman and butcher as to the weight of the animals. They never can become general, because the expense of appointing some person to see the stock slaughtered and weighed is greater than either party has been found willing to pay. The supplies of sheep have continued very deficient for the season, and large portions of them have been composed of tegs. The quotations have risen fully 2d. per 8lbs., and we have known instances in which Down sheep, on being brought to the scale, have stood the buyers in 5s. per 8 lbs. This is by far the highest figure we have had to quote for some years, and yet we see little or no prospect of a decline in it; indeed, appearances are still in favour of a further advance. There has been a full average business doing in lambs, at prices varying from 4s. 10d. to 6s. 4d. per 8 lbs. Both calves and pigs have sold readily at extreme quotations.

The arrivals of stock from the continent have increased to some extent; whilst their general weight and condition have improved. Throughout Holland, beasts, sheep, and calves have risen considerably in price, thereby rendering it a matter of extreme difficulty for the agents there to make purchases to meet the quotations in Smithfield, notwithstanding that stock is represented as being abundant.

The present high value of stock and the great abundance of pasture food have enabled the graziers to keep back rather large portions of the supplies which would, in the event of low prices and a short supply of food, have been forwarded for sale. Opposed as we have been to premature slaughtering, we regard these features as calculated to produce an increased quantity of meat for general consumption.

The following are the imports of foreign stock into the metropolis during the month :—

	Head.
Beasts	2,293
Sheep	10,529
Lambs	1,233
Calves	2,621
Pigs	191

IMPORTS AT CORRESPONDING PERIODS.

	June, 1849.	June, 1850.	June, 1851.	June, 1852.
Beasts	1,300	1,515	1,413	2,035
Sheep	7,631	7,398	7,937	9,784
Lambs	386	302	593	965
Calves	1,459	1,600	1,331	2,145
Pigs	2	125	651	227

The total supplies exhibited in Smithfield have consisted of

	Head.
Beasts	20,137
Cows	552
Sheep and lambs	130,500
Calves	3,328
Pigs	2,565

SUPPLIES AT CORRESPONDING PERIODS.

	June, 1849.	June, 1850.	June, 1851.	June, 1852.
Beasts	15,899	16,608	17,805	18,209
Sheep and lambs	153,320	182,620	169,420	134,160
Calves	2,667	2,453	2,275	2,781
Pigs	2,322	2,475	2,611	2,820

The arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire, have amounted to 10,100 Scots and shorthorns; from other parts of England, 2,900 Scots, Herefords, runts, Devons, &c; and from Scotland, chiefly per railway, 1,604 horned and polled Scots.

Owing to the hot weather, Newgate and Leadenhall markets have been very scantily supplied with each kind of meat. Generally speaking, the demand

has ruled active, and prices have continued on the advance. Beef has sold at from 2s. 8d. to 4s.; mutton, 3s. 4d. to 4s. 8d.; lamb, 4s. 10d. to 6s. 2d.; veal, 3s. 10d. to 4s. 10d.; and pork, 3s. 4d. to 4s. 4d., per 8 lbs., by the carcase.

Butchers in general have been loud in their complaints on the subject of the present high value of stock, and numbers of them have informed us that, in many instances, they have carried on their business at a loss; and it may be remarked that great difficulty has been experienced in getting rid of the most inferior joints. We do not mean to observe that the poorer classes have purchased largely of the primest qualities; but it is evident, that second-rate beef and mutton were never in such extensive request as at present. However, it is quite clear that consumption must have a limit, although we see little or no chance of any decline in present rates, which unquestionably are remunerative, notwithstanding that store stock was selling at enhanced rates in the early part of the year. At the present time, half-fed sheep are held at exorbitantly high prices, which render it almost unsafe to purchase largely.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF JUNE.

Rather an important rise has taken place in the value of wheat since our last, and prices of other kinds of agricultural produce have also improved. The upward movement in wheat we were prepared for, and we can look back with some satisfaction to preceding articles, in which we have endeavoured to point out the various circumstances which, in our opinion, would tend to bring about a rise, the result having proved that our calculations were not very far from correct.

The somewhat serious fall which occurred in prices of wheat in May, was caused by the simultaneous arrival of large supplies from the Black Sea, the Mediterranean, and the Baltic. The consumptive demand, though active, was not sufficiently extensive to absorb all at once the whole of these liberal receipts, and speculators keeping aloof, we experienced a temporary pressure, the result of which was a decline of 4s. to 5s. per qr. This took place in the face of inauspicious weather, and by no means favourable reports respecting the growing crops. The ease with which prices have recovered from so great a depression, and the rapid disappearance of the enormous importations, afford ample proofs of the soundness of the trade. The fact is, that the grounds on which we have all along based our calculations as to a comparatively high range of prices, cannot be questioned—firstly, the inferiority of the wheat crop of 1852; and secondly, the very extensive consumption of bread, that having for some time been, and still continuing one of the cheapest articles of food. Nearly the whole of the decline which took place in May has since been recovered, and though there have recently been indications of a pause in the upward movement, we see no reason to expect any material reaction.

The weather has undergone a decided improvement since our last; the first eight or ten days in June were not propitious, but subsequently the wind, which had for a long period been easterly, veered to the westward, the temperature rose, and warm showers fell in most parts of the kingdom. This supply of moisture, followed as it was by great heat, acted very favourably on the grain crops, and an amazing improvement was wrought thereby in the aspect of the country. This naturally has had some effect on the minds of buyers and sellers of grain, and the activity which prevailed the first fortnight of the month has been succeeded by a period of comparative calm. Thus far, the character of the weather and the appearance of the growing crops have not exercised so great an influence on quotations as usual; indeed, they may be said to have been almost wholly governed by supply and demand. In May the former exceeded the latter; and though the weather was then much more unfavourable than it has been since, prices of wheat gave way, as already intimated, 4s. to 5s. per qr. In June, on the contrary, with a decided improvement in the prospects for the future, a falling off in the supplies sufficed to alter the state of affairs, and nearly the whole of the above-named decline was speedily recovered. This appears to us to prove that the future range of prices will be dependent more on the extent of the imports than on any other circumstance.

At most of the principal ports in the north, from which the manufacturing districts draw their supplies of foreign wheat, stocks have, notwithstanding the liberal receipts from abroad, been reduced into a narrow compass, and the rally in prices commenced in the Yorkshire and Lancashire markets some time before it was felt in the metropolis. The increase of vegetables may be expected to cause some decrease in the demand for bread; still there is reason to believe that the north will have to look to the south for supplies,

and we feel tolerably confident in venturing to give it as our opinion that prices will not recede below their present level, even if the weather should continue auspitions.

In regard to the present position of the crops on the ground, we cannot, we are sorry to say, speak very favourably. Notwithstanding the great improvement which has unquestionably taken place in the aspect of the country since we last addressed our readers, the prospects for the next harvest are but indifferent. The autumn-sown wheat, where got in early, and on good land, looks tolerably well; but the proportion thus favourably situated is very small. The greater part was sown late, and with the soil in indifferent condition to receive the seed; and a considerable breadth of land was not seeded until spring. There is consequently a very great difference in the aspect of the wheat crop on different farms; but taking it as a whole, and allowing for the shortness of the breadth, we are decidedly of opinion that the yield must fall short of the usual average.

The barley and oat crops suffered from the east winds and cold nights in May, and, though much improved since, are exceedingly backward. Beans and peas are likely to be short, more especially the latter crop. The wheat did not come into ear till about a fortnight after the accustomed time, and unless we should have very forcing weather in July, the harvest must be late—always a great disadvantage.

The cutting of grass was pretty generally commenced in the southern parts of the kingdom about the middle of the month; comparatively little has, however, been carried, the frequent showers which have fallen since the 18th inst. having interfered with carting. The bulk is large, and should it be well got up, farmers will do well with this crop.

Before commencing our usual monthly retrospect of the corn trade at Mark Lane, we consider that it may be useful to say a few words respecting the probable extent of the arrivals from abroad. We touched on this subject in our last, and nothing has since occurred to alter our opinion materially; still a re-examination of the matter may not be amiss.

The arrivals from the Black Sea and Mediterranean have not been so large as expected; but a considerable number of vessels are known to be on passage, and many of these must now be close at hand. It is estimated, by those who have studied the subject closely, that 500,000 qrs. of wheat are at present on the way to Great Britain from ports east of Gibraltar. This is certainly a very large supply, but it will be distributed widely; different ports in Ireland will receive the greater proportion, a good many cargoes will be discharged at the channel ports, Bristol and Bermingham will take some quantity, and Liverpool will also have her share. The receipts into London are therefore not likely to be overwhelming.

The Baltic supplies have fallen off within the last week or two, and the probability is that the arrivals from thence will be on a comparatively small scale during the next month. The number of vessels which have passed Elsinore within the last fortnight has not been large, and by the latest advices from the Baltic, we learn that there was but little being shipped, the limits of the English orders received having been too low to allow of their execution.

From America the exports of flour were trifling in May, but it is probable that the recent rise here may induce consignments; these cannot, however, if they should take place, be expected to reach us just yet, and we are decidedly inclined to think that the importations of foreign bread-stuffs will during the next month be much lighter than they have been in any preceding month this year. With regard to the home deliveries, there is reason to believe that so soon as farmers shall have succeeded in securing their hay, they will thrash pretty freely, and as they are supposed to hold quite as much wheat as they usually do at this period of the year, we may expect to see the markets in the agricultural districts rather liberally supplied, which would certainly tend to keep down quotations; but we repeat what we have already stated, that we do not expect a lower range of prices between this and harvest than that now prevailing, more especially for the finer descriptions of wheat, whether of home or foreign growth.

Stocks of barley and oats appear to be very nearly exhausted in all parts of England; of the latter grain some quantity remains in growers' hands; in Scotland and in Ireland the stocks are probably about as large as usual at the corresponding period of the year, but the scarcity of wheat in the sister isle will prevent shipments of oats of consequence to this side of the channel. Barley has all along borne a relatively higher value than wheat, and is likely to creep up rather than recede in value. Oats may also be expected to rise during the next month, more especially if anything should occur to lead to an impression that the accustomed supplies from Russia—which, in the present state of political affairs, is not improbable—should be interrupted or delayed.

The arrivals of wheat coastwise into the port of London have been on a moderate scale; less than usual has reached us from Lincolnshire and that neighbourhood, shippers having directed their consignments to Wakefield, &c., where better

prices have, until lately, been obtained than in London. The receipts have therefore been principally from Essex, Kent, and Suffolk; what has been furnished by these counties has scarcely sufficed to provide for the weekly wants of the town millers. We have consequently had a steady rise in prices. The advance on the 6th inst. amounted to 2s. per qr., and there was considerable competition between buyers to secure the best runs; hence the stands were cleared almost as soon as the samples were exposed. During the following week, the confidence of purchasers increased, and on the 13th a further rise of 1s. to 2s. per qr. was established without much difficulty. The auspicious change which afterwards took place in the weather had the effect of checking the upward movement, and on the following Monday the extreme prices of the preceding week were paid with some reluctance; still no quotable reduction took place, and the weather having since become broken, we should not be surprised to see a renewed activity ere long. The millers do not in general hold large stocks, and as they made rather extensive forward sales in the early part of the month, they will not be able to go on long without buying.

The arrivals of foreign wheat into London have, until within the last eight or ten days, been liberal; since then, however, they have been comparatively small. The rise which took place the first fortnight in the month, in the value of English, was closely followed as regards foreign; and we consider that the finer descriptions of the latter have got up quite as much as the best samples of home growth. The red wheat received from the Lower Baltic ports, the produce of 1852, is far superior to our own growth of the same season, and has consequently realized higher prices. At present Pomeranian, Uckermark, and Silesian red wheat, weighing 61lbs. per bush., realizes from 50s. to 51s. per qr., and 62lbs. parcels 52s. per qr. For superior Rostock 52s. up to 54s. per qr. is demanded, and very choice high-mixed Danzig has, we believe, been sold at 63s. per qr. Stocks in granary have been considerably reduced, notwithstanding the large arrivals; and if the receipts should fall off as anticipated, the best sorts would soon become scarce. Besides the regular local demand, we have been visited by buyers from different parts of the kingdom; these have generally conducted their operations with considerable caution, being disappointed at the prices asked; still the aggregate quantity taken off the market has been large. There may perhaps be a pause of a week or two in the country demand; but that those who have lately bought will have to return to our market for fresh supplies so soon as those recently secured shall have been consumed, is certain; and we reckon on a steady demand for foreign wheat up to harvest.

The value of Black Sea and Mediterranean wheat, which was much depressed in May, recovered rapidly in the early part of this month; the advance from the lowest point of depression may be fairly estimated at 5s. per qr., and at present floating cargoes of red Polish Odessa cannot be bought under 40s. to 42s., as in quality. Other sorts have risen in the same proportion; the last sales of Ghirka were at 42s. per qr., and for Marinopoli and Berdianski from 45s. to 46s. per qr., cost and freight, has lately been paid. There were few arrivals off the coast between the 6th and the 20th; but since then rather a large fleet of vessels has appeared; but an active foreign demand has given a fresh impetus to the upward movement.

The top price of town-manufactured flour has undergone no change since our last. Whilst wheat was advancing, the bakers were free buyers; but within the last ten days the sale has been much less extensive. Country flour (more especially Norfolk household), which was relatively lower than other descriptions, has improved in value and is at least 2s. 6d. per sack dearer than it was at the close of May. The arrivals of flour from abroad have been unimportant; in France prices have risen so fast as to put a stop to shipments, and the supplies from Spain have decreased materially. From America the arrivals have for some weeks past been quite insignificant, not only here, but likewise at Liverpool. Speculative investments to some extent were made in barrelled flour in the early part of the month, which, with a tolerably active consumptive demand, enabled sellers to establish an advance of 1s. 6d. per brl. The demand slackened for about a week; but since then large parcels have been taken for export.

Barley of home-growth has come very sparingly to hand, and the arrivals of foreign have, during the last week or two, fallen off materially. There has not been much demand for malting or distilling qualities, but the scarcity of the finer kinds has prevented prices suffering any decline. Grinding barley has been in good request, and has rather crept up in value, notwithstanding the reported improvement in the appearance of the growing crop since the rain. Good qualities from Denmark, weighing 52lbs. to 53lbs. per bushel, are worth 28s. per qr., and other descriptions have sold at corresponding rates. Some quantity of French has reached us, but being much inferior to the Baltic sorts, sellers have had to take from 24s. to 26s. per qr. The market has, however, been mostly cleared of the latter, and purchases could now hardly be made on the terms named. In southern barley, viz., Alexandrian, Smyrna, &c.,

a fair business has been done, at 23s. to 24s. per qr.

The value of malt has undergone no change since our last monthly notice; there has been a steady demand, which sellers have met, without attempting to raise their pretensions, and we consider quotations precisely the same as before.

The arrivals of oats coastwise have been on the same limited scale as for some months past, and the receipts from Ireland have fallen short of expectation. From abroad we received tolerably good supplies the first fortnight in the month, but during the last week or two these have also been on a materially reduced scale. The large dealers, who have for a considerable time past drawn rather freely on their stocks, without deeming it necessary to purchase extensively, have at length found themselves compelled to come into the market, and this occurring simultaneously with the falling off in the foreign arrivals, prices have suddenly advanced. The total rise from the lowest point we consider to be 1s. 6d. per qr. This improvement commenced the second Monday in the month, a rise of 6d. per qr. being then established; this was followed up by a further enhancement of 1s. per qr. on the 20th, and the tendency is still upwards. For Riga and Archangel oats 22s. per qr. has this week been realized. Danish feed, in fair condition, are worth 21s., and seeds 21s. 6d. per qr. Of English there are hardly any on the market, and prices are consequently nominal. Scotch sell at from 23s. to 26s., and Irish may be quoted from 18s. up to 22s. per qr., as in quality. We may calculate on still receiving some quantity of oats from the Danish Islands, Sweden, and a small supply from Dutch and Hanoverian ports, but we must depend principally on Archangel, St. Petersburg, and Riga for arrivals; and if these should, in consequence of the political state of affairs, be withheld or interrupted, we should certainly experience a very great scarcity of this grain.

Beans have felt the influence of the advance in oats, and must be quoted 2s. per qr. higher than they were at the close of last month. This rise has taken place within the last fortnight, and extends to Egyptian, as well as to home-grown.

Scarcely any peas have come forward, and though the demand for this article is not very extensive at this period of the year, prices have crept up 1s. to 2s. per qr., and good boilers are now held at 44s. per qr., and even higher. The growing crop is said to be exceedingly short.

Less than the average amount of business has been done in Indian corn. The Irish demand has been comparatively trifling, but this is not unusual in June, when new potatoes begin to come into consumption. There are at present few cargoes off the coast, or near at hand, and for those at a distance there has been little or no demand. The prices asked for arrived cargoes from the Black Sea vary from 28s. up to 31s. per qr., cost and freight, according to quality, condition, &c.

The remainder of our space we shall devote to a short notice of the state of the corn trade abroad at the dates of our latest advices.

During the greater part of May and early in June, the weather was cold and ungenial on the continent of Europe, as well as in this country, but at about the same period that it changed here a favourable alteration likewise took place abroad. The fears so generally entertained in Holland, Germany, and Belgium, respecting the rye crop, have consequently been in a great measure dissipated, and wheat, notwithstanding the somewhat inauspicious character of the spring, is said to promise a good return. Prices of the latter article have nevertheless continued to rise at all the principal ports in the Baltic, as well as at Hamburg, Rotterdam, Antwerp, &c. That this has been partly caused by the advance here is more than probable; but, at the same time, it appears tolerably certain that the large shipments made immediately after the opening of the navigation to Great Britain reduced stocks abroad into a very narrow compass. Danzig is nearly the only place in the Baltic where any quantity of wheat of importance is held, and holders there are so confident of an extensive English demand that they are by no means anxious sellers. Letters from thence of the 24th inst. inform us 51s. per qr. free on board had been freely paid for superior quality.

At Stettin, a great deal of speculation took place in rye in May, and prices were driven up to a very high point; the subsequent improvement in the weather caused a serious reaction, and this, to a certain extent, had its influence on wheat; still good qualities of red have not been sold there below 45s., and by the most recent accounts 46s. per qr., free on board, was again asked.

Rostock advices of the 24th inst. state that farmers had almost ceased to bring wheat to market, and that the supplies of spring corn had proved insufficient to satisfy the local demand. The commoner sorts of wheat could not be bought, so as to be put free on board, below 46s. per qr., and for fine 62lbs. quality 47s. per qr. had been demanded. Prices of barley and oats were out of proportion to those current here. We have similar reports from most of the other Lower Baltic ports.

At Hamburg, and in the Dutch and Belgian markets, stocks of wheat are very small, and purchases could not be made at any of the near continental ports at such prices as to leave a margin

for profit on sales in England, at the terms at present current. The same may be said respecting France; indeed, there appears a strong probability of the latter country requiring supplies of wheat, and within the last week purchases of several thousand quarters have actually been made in London on French account. From the Mediterranean the reports of the crops are more favourable than they were a month ago, but quotations are much too high in that quarter to offer any inducement to English buyers.

From the north of France the accounts in regard to the probable result of the ensuing harvest are by no means favourable, and wheat has risen materially at the principal shipping ports on the coast within the last few weeks, as well as in the interior.

At Paris, flour has advanced 1f. per sack for several consecutive weeks, and the article is now actually dearer there than in the English markets.

From the more distant ports on the Black Sea we learn that the threatening position of political affairs between Russia and Turkey had interrupted business, merchants and others having been deterred from entering into fresh engagements.

At Odessa, however, large purchases of grain had been made for the supply of the army and navy, which had given an impetus to prices. Freights were very high, and little was being shipped to British ports.

The last accounts from America describe the grain trade as dull, the export demand having for some time been far from active. At New York the supplies of flour had exceeded what had been immediately needed, and prices had consequently shown a tendency to decline.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter					
Wheat, Essex and Kent, white, new..	41	to	46	fine up to	51
Ditto ditto old ..	42		50	„	57
Ditto ditto red, new....	41		44	„	47
Ditto ditto old	42		46	„	50
Norfolk, Lincoln, & Yorksh., red..	41		46	„	51
Ditto ditto new	36		43	„	45
Ditto ditto white new,	none			„	—
Ditto ditto old	none			„	—
Barley, malting, new.. 30 32	Chevalier .				32	37
Distilling .. 27 29	Grinding .				25	29
Malt, Essex, Norfolk, and Suffolk, new	54		55	extra	58
Ditto ditto old	52		54	„	56
Kingston, Ware, and town made, new	59		60	„	63
Ditto ditto old	57		59	„	61
Oats, English feed.. 19 23	Potato..				22	26
Scotch feed .. 23 27	Potato..				25	29
Irish feed, white	19		21	fine	23
Ditto, black	18		19	fine	21
Rye	28		30	old	28	30
Beans, Mazagan.....	33		34	„	34	35
Ticks.....	34		36	„	36	38
Harrow.....	35		37	„	37	39
Pigeon	36		40	„	40	44
Peas, white boilers 37 40.. Maple 32	36.. Grey				30	35
Flour, town made, per sack of 280 lbs.	—		—	„	39	44
Households, Town 40s. Country	—		—	„	35	38
Norfolk and Suffolk, ex-ship	—		—	„	33	35

IMPERIAL AVERAGES.

For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
May 14, 1853..	44	7	31	5	18	8	29	8	35	5	33	3
May 21, 1853..	43	11	30	11	19	1	35	8	36	0	32	1
May 28, 1853..	43	9	30	6	18	7	33	2	36	7	32	7
June 4, 1853..	43	3	29	6	19	0	34	0	36	9	33	8
June 11, 1853..	43	11	29	10	18	10	34	9	38	1	34	9
June 18, 1853..	45	0	29	1	18	11	30	11	38	11	34	6
Aggregate average of last six weeks	44	1	30	2	18	10	33	0	37	0	33	6
Comparative avge. same time last year	40	9	27	9	20	2	30	2	31	7	30	2
Duties.....	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Friday's Av. s.	d.	Averages from the corresponding *Gazette* in 1852.	Qrs.	Av. s.	d.
Wheat....	98,824 ..	45	0	Wheat....	100,671 ..	40	9
Barley....	4,104 ..	29	1	Barley....	3,354 ..	27	5
Oats	15,180 ..	18	11	Oats	12,124 ..	20	2
Rye.....	309 ..	30	11	Rye.....	27 ..	30	7
Beans....	3,884 ..	38	11	Beans....	3,118 ..	32	0
Peas	272 ..	34	6	Peas	464 ..	31	9

HOP MARKET.

BOROUGH, Monday, June 27.

The few hops in offer fully maintain former rates. Our reports from the plantations are somewhat less unfavourable. Duty £135,000.

Mid and East Kents.....	130*s.* *to* 180*s.*
Weald of Kents.....	128*s.* „ 140*s.*
Sussex	115*s.* „ 130*s.*

POTATO MARKET.

SOUTHWARK, WATERSIDE, Monday, June 27.

Since our last report the demand for old Potatoes has been daily declining; there being a good supply of new ones from France and Germany, and a few from the neighbourhood of London.

This will be the last report from the Waterside market for the season, as a few days will clear all out.

The following are the present quotations:—

York Regents .... per ton	40*s.* *to* 60*s.*
Lincolnshire ditto	40*s.* „ 50*s.*
Scotch ditto.....	None.
Ditto Reds	20*s.* „ 40*s.*
Rhenish	20*s.* „ 40*s.*

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	*s.*	*s.*		*s.*	*s.*
Friesland .....-	86 *to*	88	*Cheese, per cwt. Cheshire*	66 *to*	86
Kiel.....	82	86	*Cheddar*	66	80
Dorset.....new	96	—	*Double Gloucester*	66	72
Carlow..... „	78	82	*Single do.* ..	60	70
Waterford .. „	74	80	*Hams, York, new*....	84	94
Cork..... „	76	82	*Westmoreland*..	80	90
Limerick .... „	74	80	*Irish*	70	80
Sligo..... „	74	82	*Bacon, Wiltshire, green*	70	76
Fresh, per doz. 10*s.* 6*d.* 11*s.* 6*d.*			*Waterford*	68	70

WOOL MARKET.

BRITISH WOOL TRADE.

Current Prices.

	s.	*d.*		*s.*	*d.*
South Down Hoggets	1	4	*to*	1	6
Half-bred ditto	1	3½	—	1	6
Ewes, clothing.....	1	2	—	1	3
Kent fleeces.....	1	1½	—	1	3
Combing skins.....	1	1	—	1	4½
Flannel wool	1	0	—	1	4
Blanket wool	0	8	—	1	0
Leicester fleeces.....	1	2½	—	1	4

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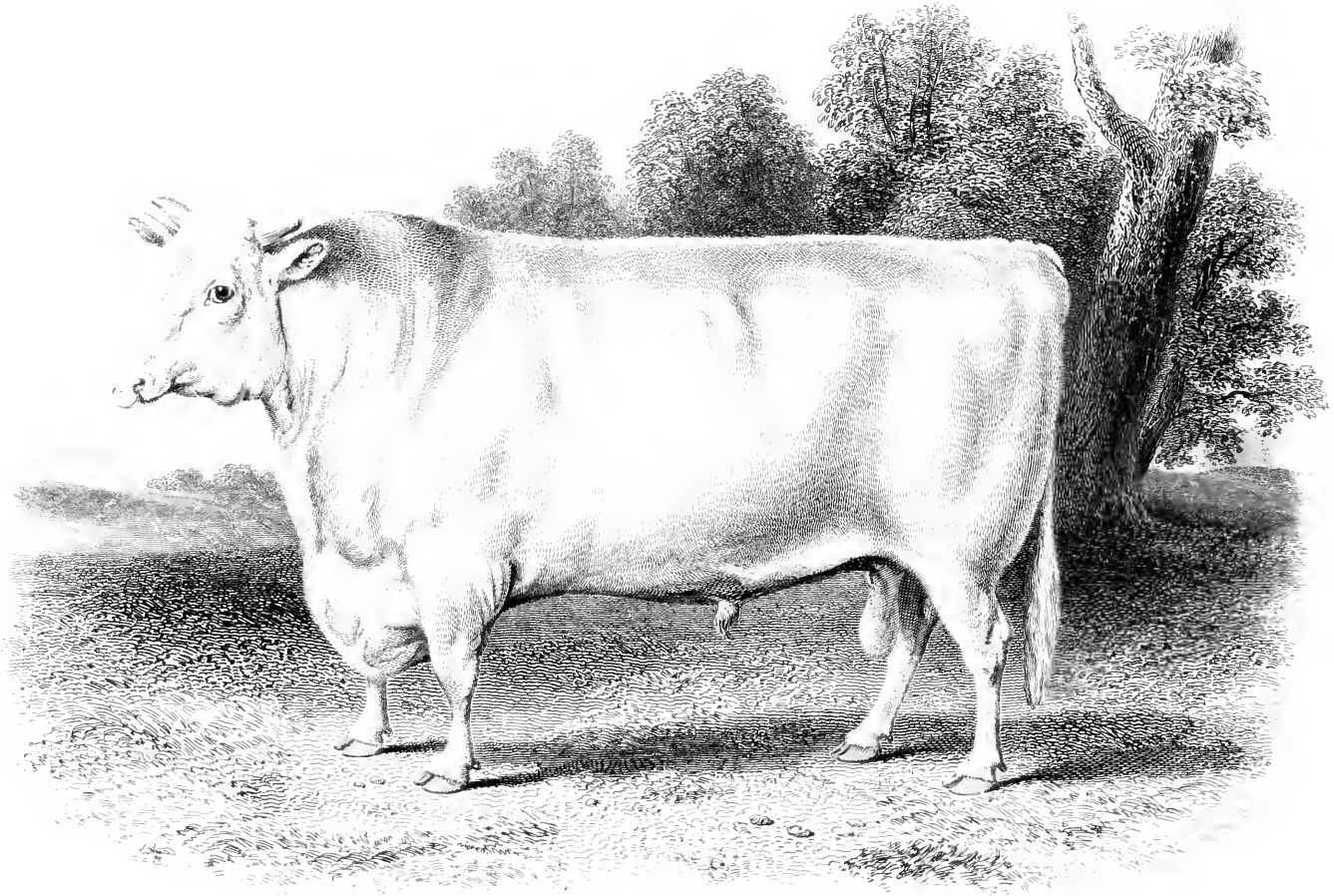

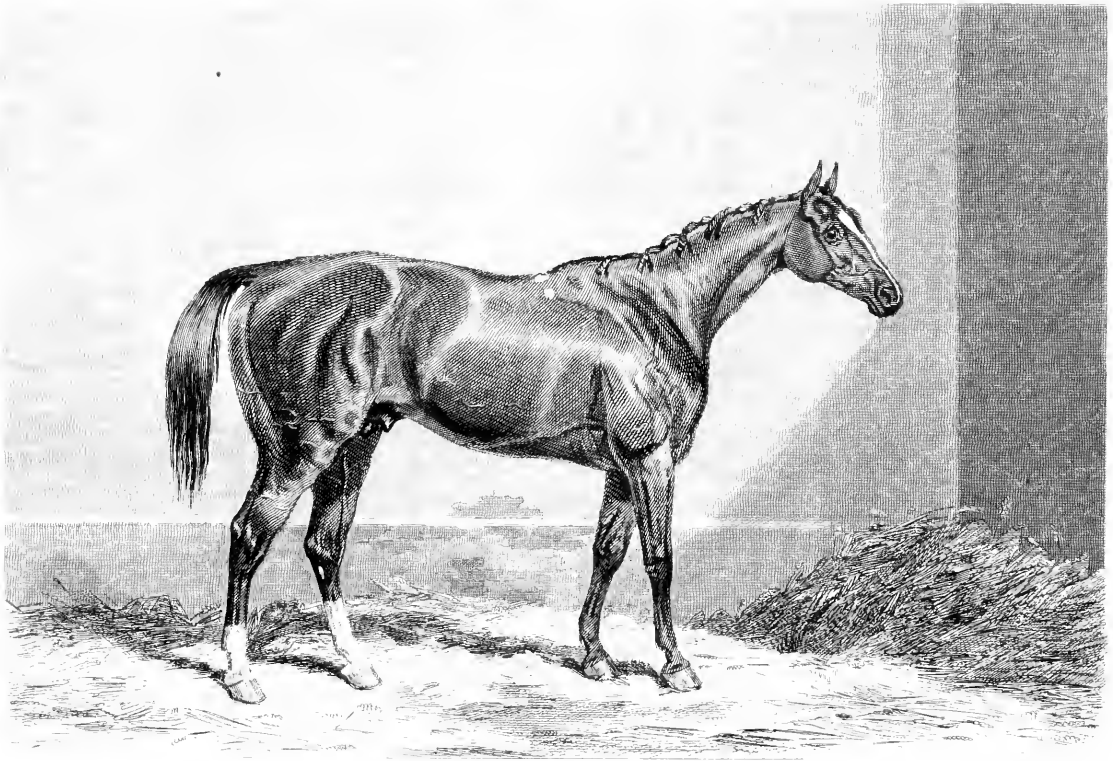

THE FARMER'S MAGAZINE.

AUGUST, 1853.

PLATE I.

A SHORT-HORNED BULL,

THE PROPERTY OF F. H. FAWKES, OF FARNLEY HALL, NEAR OTLEY, YORKSHIRE,

To which the first prize of Twenty-five Sovereigns was awarded at the Royal Agricultural Society's Show, held at Sheffield, in August, 1852.

PLATE II.

STOCKWELL; A CELEBRATED HORSE,

THE PROPERTY OF THE MARQUIS OF EXETER.

Stockwell, bred by the late Mr. Theobald in 1849, and called after his well-known breeding establishment at Stockwell, was got by the Baron out of Pocahontas, by Glencoe, her dam Marpessa, by Muley —Clare, by Marmion—Gohanna.

Stockwell is a bright chesnut horse, standing sixteen hands high; he has rather a plain head, with a Roman nose, and small ears; a short, strong neck, with good shoulders, and fair depth of girth; his ribs and barrel are immense, his back and loins showing great power, and his quarters equally good, though a little short from the hip to the tail; he has very powerful thighs and arms, large hocks, knees, and bone generally, with very sound legs and feet. He has a blaze of white in his forehead, running right down to his nose, and two white heels behind; a switch tail, which, like his head, he carries well up; and a most even, easy temper, both for public and private life. Stockwell altogether is a fine, powerful, but by no means handsome horse, and looking quite as much like carrying sixteen stone to hounds as winning a Leger.

METEOROLOGY—ITS INFLUENCE UPON THE CULTIVATION OF THE EARTH.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

In tracing the influence, which a varying degree of moisture and temperature exerts, in determining the general mode of cultivation, by which most of our English counties are distinguished, we have as yet paid little attention to the causes of these meteorological variations.

The mild temperature of Britain, and the difference in the climate of its western and eastern sides, may be traced to a variety of sources, the chief of which, however, is the higher temperature of the water of the Atlantic compared with that of the German Ocean, and the consequent moister atmosphere which rests on its surface. This is mainly owing to the great ocean current or stream, which sets over to our island from the Gulf of Mexico. The origin of this great ocean river, whose vast extent, and the marvellous effects it produces in tempering the severity of even the winters of Lapland, has not attracted the general attention its importance deserves. Humboldt in his "Cosmos", translated by

Sabine, (*vol.* i, *p.* 299), has sketched with his usual clearness, giving all that is known on the subject, and tracing it from its first origin at the south-east of the Cape of Good Hope. "The general movement of the sea from east to west between the tropics, known by the name of the equatorial or rotation current, is regarded as the joint effect of the trade winds, and of the progressive propagation of the tidal wave. Its direction is modified by the resistance which it experiences from the eastern sides of continents. The velocity of this current, computed by Daussy from data supplied by bottles purposely thrown overboard, and subsequently picked up in different localities, agrees within one-eighteenth part with the velocity of ten French nautical miles in 24 hours, which I had previously deduced from comparing the experience of different navigators. Columbus was aware of the existence of this current at the period of his third voyage (the first in which he sought to enter the tropics in the meridian of the Canary Islands); since we find in his journal the following passage —"I regard it as proved that the waters of the sea move from east to west, as do the heavens, (or the apparent motion of the sun, moon, and stars) "*las aguas van con los cielos.*" Of the narrow currents or true oceanic rivers of which we have spoken, some carry warm water into higher, and others cold water into lower latitudes. To the first class belongs the celebrated gulf stream, the existence of which was recognised by Anghiera, and more particularly by Sir Humphrey Gilbert, as early as the 16th century, and of which the first origin and impulse is to be sought to the south of the Cape of Good Hope. After a wide circuit, it pours itself from the Caribbean sea and the Mexican Gulf through the Channel of the Bahamas, and following a direction from S.S.W. to N.N.E., deviates more and more from the coast of the United States; until, deflected still further to the east by the Banks of Newfoundland, it crosses the Atlantic, and casts an abundance of tropical seeds (*Mimosa scandens, Guilandina bonduc, Dolichos urens,*) on the coasts of Ireland, of the Hebrides, and of Norway. Its north-easternmost prolongation mitigates the cold of the ocean, and exercises a beneficent influence on the climate of the northernmost point of Scandinavia. This great current, there is little doubt, meets with and crosses over (from its superior lightness, owing to its higher temperature,) other colder, and therefore heavier currents flowing in an opposite direction from the north, just as the great fresh-water currents, caused by the great rivers Amazon and La Plata, pass over the currents of the ocean, which cross them two or three hundred miles from land.

That the water of the gulf stream is warmer, and flows with greater velocity in some years than in others, is, as Mr. N. Whitly remarks in a very valuable prize essay on the climate of the British islands, in its effect on cultivation (*Jour. R.A.S, vol.* 11, *p.* 1,) well known; and this is the most probable cause of the great variations which occur in our winter temperature, and a mild winter is usually accompanied with much rain. Thus, in 1845, the 'Clyde' on her voyage to Barbadoes found the winter temperature of the water near the Scilly Islands as warm as it actually is off the coasts of Portugul. (*Edinburgh Phil. Journal,* 1846.) The succeeding autumn months at Truro were exceedingly mild, and the following January and February were 6 degrees above the average temperature. There is little doubt, therefore, that to the varying flow, and the changeful temperature thereby produced, in the surface waters of the western ocean may be attributed the fickle seasons to which we are so well accustomed. There is a secondary effect also produced by these changes, viz., the greater or less cloudiness of the sky, which again influences the temperature of the earth's surface.

The temperature of the air, as influenced by the state of the clouds, will be found in the following table, by Mr. Glaisher (*Trans. Royal Soc.,* 1847., *p.* 214). In this, column I. gives the date of the observations; II., the monthly (in 1844) mean reading of the minimum self-registering thermometer, placed in the air at the height of 4 feet from the ground on *cloudy* nights; III, on broken cloudy nights; IV, on half cloudy nights; V., on principally clear nights; VI., on cloudless nights.

1.	II.	III.	IV.	V.	VI.
January....	33.0	37.6	34.1	34.1	22.0
February ..	32.3	27.9	35.3	29.4	29.4
March	37.8	38.9	33.5	41.9	30.5
April.....	47.1	46.6	45.4	43.0	39.6
May	47.1	46.2	42.4	42.5	44.1
June	50.3	51.4	52.5	50.4	53.0
July	56.2	55.4	54.6	53.8	52.8
August	54.8	51.6	51.1	49.3	47.7
September..	55.3	54.1	59.7	50.8	44.3
October ...	47.0	45.3	45.3	46.0	40.1
November..	42.6	42.0	38.9	33.5	41.6
December..	31.9	—	—	30.1	24.6

The radiation of heat from the earth's surface is a question full of interest; for (as Mr. Glaisher remarks) to many persons it must be a new fact that a perfectly dry body placed in contact with other bodies of the same temperature with itself when the sky is covered with clouds, shall, on the sky becoming less cloudy or cloudless, become much colder than those bodies. The formation of dew was found to depend solely upon the temperature of the bodies upon which it was deposited; the amount of water thus deposited was the greatest upon the substances whose temperatures were the lowest. Radiation of heat from the

earth to the heavens must exist at all times, both day and night, and in all states of the sky. Generally, when the sun is above the horizon, the heat emitted by it to the earth will overbalance that which the earth radiates upwards; at times, however, in places shaded from its direct beams, the amount of heat radiated exceeds that received from the sun and all other sources, and dew will be continually deposited throughout the day.

From the elaborate series of valuable experiments by Mr. James Glaisher, we find, amongst other things very closely connected with the objects of this paper, that the mean excess of temperature indicated by a thermometer placed in the air, at the height of four feet from the ground, and protected from the effects of radiation, above those of thermometers placed on different substances fully exposed to the sky, was as follows—

On long grass	8.39
On short grass	7.30
1 inch below the surface of the ground under grass	1.75
On surface of ground under long grass	0.55
Ditto under short grass	1.69
On long grass covered with glass	6.01
Ditto, glass 1 inch thick	3.35
Ditto, covered with hare-skin	0.75
Ditto, covered with rabbit-skin	0.60
1 inch above the top of the grass (in air)	5.63
2 inches ditto ditto	4.78
3 inches ditto ditto	4.00
6 inches ditto ditto	2.37
1 foot ditto ditto	1.08
2 feet ditto ditto	0.72
4 feet ditto ditto	0.58
6 feet ditto ditto	0.44
8 feet ditto ditto	0.14
10 feet ditto ditto	0.13
12 feet ditto ditto	0.12
On brick	3.12
On pantile	3.94
On slate	4.81
On glass	7.25
¼ of an inch above water	2.72
On hare-skin	11.04
On rabbit-skin	10.40
On stone	3.27

"Of all the substances experimented upon (adds Mr. Glaisher) those on which the readings of the thermometer have been the lowest were hare-skin and rabbit-skin, thus explaining the fact frequently noticed by sportsmen that the snow upon which hares have been lying is never in the slightest degree melted."

In the experiments of Mr. Glaisher upon the influence of a covering of snow and other substances, on the radiation of the earth (*ibid*, p. 162); he found that the mean excess of the reading of the thermometer in air at the height of four feet protected from radiation, over other thermometers placed on various substances, which were fully exposed to the sky, was as follows; and these results, amongst other things, show the considerable extent of the protecting influence of a covering of snow to the farmer's crops—

On long grass clear of snow	7.3
On ditto covered with snow	1.3
On short grass clear of snow	5.5
On ditto covered by snow	1.0
On surface of ground under short grass clear of snow	0.9
On ditto ditto under long grass	0.1
1 inch below surface of ground under long grass covered by snow	4.2
On snow	4.8
On raw wool on snow	8.2
On flax on snow	8.3
1 foot above snow	1.7
2 feet above snow	1.8
On copper on snow	5.1
On lime on snow	5.0
On glass on snow	7.6
On blackened tin on snow	8.2

"At the time of two of five sets of observations, (says Mr. Glaisher) the mean temperature of the air was 30.9; the mean reading of the thermometer on long grass, clear of snow, was 1.8 less than on short grass, also clear of snow; and the readings were nearly alike when the two were covered with snow. The effects of snow on long grass was to cause the thermometer on the grass to read higher by 8.6. On another night of observation, February 12, 1845, snow had previously fallen to the depth of three inches, and during the night the reading of a thermometer which was placed on long grass was 6 degrees, whilst that covered by snow was 28 degrees; the effect of the snow was, therefore, to keep the grass warmer by 22 degrees, and, therefore, vegetation was kept warmer by this amount than it would have been had there been no snow. Snow being so perfect a non-conductor of heat evidently prevents to a high degree the loss of heat by radiation from bodies covered by it, and it also prevents the loss of heat from such bodies by conduction at times when the temperature of the air is lower than they are. Raw wool, flax, straw, and other bodies, which are bad conductors of heat, act in a similar way, and prevent the injurious effects of cold to bodies covered by them to which injurious effects vegetation is liable in this climate in every season of the year, since it is liable to a temperature at night below the freezing point of water in every month."

These laborious researches of the gentlemen of the Royal Observatory at Greenwich will be noted by the intelligent reader of this valuable magazine, as peculiarly interesting. They are directed (in common with the observations of the scientific sailor) to the origin of those meteorological pheno-

mena, upon which the farmer's crops are so entirely dependent. The hour has happily for agriculture now arrived, when its disciples are pretty generally convinced that by science and by skill they can *profitably* withstand the competition in a free market of the tenants of richer soils and of warmer climates. That belief the events of the last few months has very materially strengthened, and there is now, I trust, little or no doubt, but that the same energy, scientific skill, and capital, which have produced in almostevery other English pursuit an ample reward, will now under God's blessing cause a similar golden harvest to attend the agriculturists of England.

LAND AGENTS AND AGRICULTURAL ENGINEERS.

So long as those who employ land-valuers shall be content to be informed only of results, and to have processes concealed from them, no progress will be made in reducing the art of valuation to something like system.

There are many valuers who would object to making such a revelation of the reasons on which their valuation is founded, because they have nothing to reveal. With such, mere mystification is everything; their valuation is a mere guess. In some cases it is founded on the appearance of the crops; so that the good farmer pays a larger rent than the sloven, for land of the same intrinsic quality. In other cases they arrive at the value by the simple process of ascertaining the current rate of rents in the neighbourhood. We know a gentleman who purchased an estate on the valuation of a professional man of this kind, to whom he was recommended by his solicitor. He found a dashing and extensive office, a host of clerks, a large array of maps and red-taped bundles of papers, together with tin boxes innumerable, bearing the names of the Earl of This, and Sir Something That. Such a man must be in extensive practice, thought our friend; he must know something of the value of land. He discovered, some years afterwards, in what this knowledge consisted, and how the valuation was made. This valuer of land knew so much about land that he did not find it necessary to go over the estate; but sat on a gate in one of the fields, assembled the tenants, heard what rents they were paying, added twenty per cent., multiplied the sum by thirty, and there was the value of the land in fee, at so many years' purchase. The cost of this elaborate valuation was, in one shape or other, more than one hundred pounds. A host of valuers of this kind sprang up during the war. It was an easy vocation then, when prices were continually advancing. But these locusts proved the curse of the tenant farmers when the revulsion came. There are other valuers, who go into some of the fields, but not all, give a kick to the grass or clods, as the land happens to be under grass or arable, assume a very important and mysterious look, and jot down something in their notebook as the value. So long as landowners shall be satisfied with this, they will receive nothing better in the form of professional assistance; but let them insist on being informed, not only how much their land is worth, but why it is worth so much, and the system will speedily be changed. At the present rate of remuneration for valuing land, more ought to be done. The valuer ought to go into every field, and open holes in it, in order to ascertain the composition, and, above all, the depth of the soil, the nature of the subsoil, and of the substrata on which they rest. He ought to furnish his employer with a map, or a field book, in which these particulars are recorded, together with the indications afforded by the natural vegetation. He should point out, in his report, the local circumstances which cause him to set a higher or lower value than the average rent of land of similar intrinsic quality in other localities. He should state the improvements of which it is susceptible, the estimated cost of such improvements, and the interest which they may be expected to pay for the capital expended to effect them. He should state the value of the land, under the system of cultivation established in the neighbourhood, and its value under a better system in actual operation elsewhere, upon land of the same intrinsic quality, under similar conditions of climate.

All these particulars land-valuers ought to give, and they would give them if employment were to be obtained on no other terms. There are many land-agents capable of giving them. There are many who would now give the data, be they those above described or any other, from which their conclusions are derived, if it were not contrary to custom to do so.

It is through such men acting in conjunction that we must arrive at a true knowledge of soils. It is out of the communication of the knowledge of the processes which they employ, that system will arise where at present there is little more than chaos, and that an art will be exalted to the rank of a science; for "science is the knowledge of many, methodised and arranged so as to be attainable by one."

We have a Geological, a Chemical, an Astronomical Society; we have a Royal Agricultural Society, and local associations of the same kind without end. We have an Institute of Civil Engineers, and an Institute of Actuaries: why should we not have an Institute of Land Agents and Agricultural Engineers? It might consist of such members of the profession as are willing to communicate, to those who employ them, processes as well as results. It is only through the co-operation of such men, aided by those men of science who will join them, that we shall ever obtain a systematic classification and nomenclature of soils and subsoils, and of substrata in their agricultural relations. Such knowledge, by whatever name we may call it, is, in fact, agricultural geology. An Institute of Land Agents and Agricultural Engineers would be more comprehensive, however, than an Association for the Advancement of Agricultural Geology; because a knowledge of soils, subsoils, and substrata is only one part of the business of a land-agent: there are the principles and practice of draining, embanking, irrigating, planting, and road making to be discussed; and there is the wide subject of agricultural mechanics; and above all, the means by which that hundred-handed giant Steam, whose connection with agriculture is increasing day by day, may be best made to do our bidding in the art of cultivation. Such an association should have a central establishment in London, where papers might be read and discussed; and it should hold sectional meetings at the gatherings of the British Association, and the Royal Agricultural Society; it should publish transactions—unless arrangements could be made for engrafting them, by way of appendix, on the journal of the latter society. This institute would not clash with any existing agricultural society. It would rather form an upper house to such societies. Consisting, as it would, of the most highly educated among practical men connected with agriculture, it would take a higher range of subjects; and not leaning so much on the agricultural masses for support, it would be less addicted to the worship of the bull Apis, under the form of cattle-shows, and the exaltation of "practice" *only*, which means, in plain English, *something like* the maintenance of things as they are. The funds of such a society would not be large, but its expenses would be small in proportion, and it could not fail to be very effective in the establishment and diffusion of sound agricultural principles. We have only to add, in conclusion, that if there are among the profession any gentlemen who are of our opinion as to the utility of such an institution, we shall be happy to hear from them, to bring them in communication with one another, and to afford any aid in our power to its organization.

ON WEANING LAMBS, AND THEIR SUBSEQUENT MANAGEMENT.

One of the principal objects which I desire to keep in view in the department which I have undertaken, as an agricultural writer on plain matters of practical business, is to take up such matters in the season when any observations I may make may be most acceptable, and possibly useful, either in reminding men of business upon some point that may have for the time escaped their notice, or in giving information to the young farmer as to the usual and most desirable course for him to pursue. In trying to act in accordance with this view, I often feel perplexed in choosing a subject for the few remarks to which I have to confine myself. I have this week chosen the subject named above—as the month of July is generally, if not universally, the time of year when all flock-masters cause their lambs to be weaned.

The season or time of weaning is a critical one, both for the ewe and lamb. It is indispensable to the prosperity of a breeding flock, that the ewes during the time of suckling should be kept in a healthy and thriving state. For this purpose, they should be thinly stocked on the sweetest and best suckling pastures the farm will afford; but by no means selecting the most fattening pastures, as, in such case, they will accumulate fat, and decrease in their milking properties. The lambs will, if thus thinly stocked, have room to roam about in search of such varieties of food, or of such natural grasses, as instinct appears to direct them to, for their better sustenance; at all events, we know that the more pasture-room lambs have to roam over, the better they thrive.

The ewes should all be shorn before the middle of June. This will cause both ewe and lamb for a short time to improve fast in condition. The ewe having no fleece to support will yield more and richer milk, and will also add to her own fattening considerably. As this proceeds, her milk will slightly decrease, and it will soon become desirable, and may be sufficiently evident, that the time for weaning has arrived. The lamb, which will now be large, and require more milk, will be constantly teasing the ewe, and abstracting every drop of milk from her udder. This constant application, and consequent drawing of the udder, will begin to show detrimentally upon the ewe; and it then becomes re-

quisite, and is in accordance with good management, to wean the lamb immediately, for which contingency every good breeder will have made provision.

Weaning Lambs.—I have invariably found it to be good practice to take the ewes from the lambs, and leave the lambs in the field where they have been accustomed to graze. The pasture, owing to the absence of the ewes, will soon improve; and as they have been habituated to the field, and their wonted haunts therein, they rest more speedily, and they are saved the risk arising from a change of food as in a new pasture. On this old and well-accustomed pasture they should remain for three or four weeks, taking care that it is neither allowed to grow too fast, and become too succulent, nor too bare, or become "dry and husky," as in either case they will cease to do well, and from self-evident causes, which I need not describe. About the middle of August they should be put upon clover or grass, eddishes or aftermaths: these, again, ought not be too strong or succulent. The clover should be ready to come into second flowering, and the grass eddishes well-grown, sound and nutritious food. It is not desirable to stock heavily. The lambs must have plenty of room; and should a little waste of food take place, it will be found to be more than compensated in their extra condition. Although these remarks are more applicable to those farms possessing a proportion of permanent grass pastures, yet similar provision may be made on those not so favoured. The grass-seeds, clovers, sainfoins, trefoils, &c., may be so managed, so "laid in" and preserved, as to enable the breeder to adopt a somewhat similar course—the great desideratum being to keep the lambs thriving, without scouring, and which food too rich and succulent is sure to produce. As the pasturage declines, and in preparation for their most profitable transfer to the turnip crop, they should about the middle of September be allowed a small portion of cake or corn daily. In some districts it has been found that two ounces of good linseed-cake will suffice for each lamb, not only in promoting their condition, but in rendering them healthy, and improving their digestive functions so satisfactorily that little or no danger arises from putting them on the strongest and most luxuriant crops of winter food. This allowance should be continued for a short time, and then gradually increased to a quarter of a pound, upon which they will thrive very satisfactorily throughout the winter. I am well aware that these are very general remarks, and possibly inapplicable in many cases; but it will be seen that my aim is to incite breeders to more care in bringing up their young flock, so as to provide against the many casualties of winter. If they are "well summered" and brought to their winter food in a truly sound and healthy state, they seldom suffer much from winter changes, under proper management.

Scab, Ticks, Lice, &c.—Should a breeder unfortunately find his flock affected with that sore pest "the scab," and for which disease I know of no certain cure but mercurial ointment,* I would say that on no account must he dress his flock immediately prior to a change of keeping, and more particularly a change from grass or like pasturage to turnip keeping: it is certain death to many, and injurious to all. Some caution is requisite in dressing for ticks and lice; but as these dressings are generally arsenical mixtures in various proportions, the effect is mainly on the skin—the great danger being from colds, if used in wet weather or when the keeping is high and thickly grown. Fine weather is the best time, and a weak and plentiful dilution the best application.

The Ewe.—On weaning, the ewes should, for a few days at least, be put into the worst pasture upon the farm, and in considerable numbers too, and if without water for a day or two, all the better. The first object being to dry up their milk, the shepherd should look very closely to their udders, and, in all cases where requisite, draw a considerable portion of the milk out, and gently rub it with some soft emollient, *i. e.*, soft-soap or hog's-lard. Should any difficulty appear in drying up the milk, it will be right to bleed, and give a slight dose of purgative medicine, *i. e.*, Epsom or Glauber's salts. As their milk becomes dried up, they should be drafted on to better pasturage—more particularly those intended for sale, while those to be kept for breeding may still remain on inferior keeping. As the time, however, approaches for putting them to the ram, and all danger from their milk has subsided, they cannot be put on pasturage too rich for them; and the faster they thrive, the more security for their safety as breeders, and the more and finer lambs they will produce. They should at all hazard, and under any inconvenience, be kept on good pasturage while with the ram.

P. F.

REMEDY FOR YOUNG PIGS LOSING THEIR TAILS.—A gentleman called at this office, and stated that, by gently rubbing the tail, at two or three inches wide round its base, with tincture of myrrh, it will eventually prevent young pigs losing their tails. He assured us he has never known it to fail after many years' experience. Another correspondent assures us that a tincture made of strong whisky and bitter aloes, applied every night for a week, has the same effect, and cures the disease even when considerably advanced. He also says that the tincture of benzoin would answer equally well. In the application, care must be taken not to pull or wound the tail, but rub in the tincture lightly for about two minutes. —Irish Farmers' Gazette.

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* I have repeatedly tried as an experiment to cure scab by the application of some of the liquid preparations sold by chemists and others, but hitherto without complete success.

MANURES NECESSARY TO GROW A GIVEN CROP OF PRODUCE.

There are those who profess to know to the pound —aye, and to the ounce, the quantity of abstract manures necessary to grow a given crop of produce. Chemistry, they say, has settled the average constituents of each crop grown by the farmer, sufficiently accurately to enable the Man of Tnam to prescribe the exact ingredients for every rotation, and if a debtor and creditor account is kept of the condition of the soil, the crops removed, and the manures returned, no waste matter need ever be applied, or any want of the necessary manure ever take place. For, they argue, though the proportions of each element are not exactly ascertained, yet there is sufficient plasticity and accommodation in nature to remedy this deficiency by the substitution of one kind of material for another. Hence we have seen prescriptions in the shape of specific manures for different crops—one for flax, one for wheat, and another for turnips—mixed by the pound, and in this state prepared by the village chemist and druggist.

But it is to be feared we as yet know far too little both of the elements contained in the soil and their state to enable chemists so far to help us. We remember one gentleman, for instance, who thought that the cause of clover failure was not owing to the want of potash in the soil, but for want of a sufficient quantity of that material in a state of solubility. The whole theory of fallowing shows that there are still locked up in the undisintegrated materials of our most worn-out soils a constant supply of materials fitted to grow future crops.

We were startled a few months ago by the appearance of a letter by M. Rotshke, addressed to M. Von Thaër, showing that a farm in Silesia had been cultivated for fourteen years by the application of light artificial manures alone. The soil was of good quality; the subsoil generally rich in mineral resources, especially potash.

The feldspars often contained in clays, Professor Way thinks, may be by decomposition the origin of the double silicate, to which he says the retentive power of clays for manure is mainly attributable. And before him, Professor Hodges, of Belfast, alluded to the silicate of potash and silicate of alumina as being the result of the decay of the feldspar of granitic rocks; he showed also, by his analysis of the granite from Annalong, that it is a rock abundant in mineral elements suitable as food for plants, and gives it as follows :—

Silica	74.30
Peroxide of iron	3.00
Alumina	12.20
Lime	0.22
Magnesia	0.45
Potash and soda	9.33
Fluoric acid and water	0.50
	100.00

Hence, the decay of the granitic subsoil of M. Rotshke was likely to supply very considerable quantities of the elements of the crops.

Mr. Way shows that 20 crops of wheat, of the not unusual quantity of 35 bushels of grain and 2 tons of straw and chaff, will remove only 5540lbs., or less than two tons and a-half, per acre; and that if the soil be calculated at 10 inches in depth, and weighing 1000 tons per acre, it will only be 0.248 per cent. of the soil that would thus disappear.

The soil was carried on after a two crop-and-fallow principle—a very exhausting one, and, as we might expect, was by no means profitable.

M. Rotshke commenced, therefore, to sell off. Year after year he carried away the whole of the produce in grain and straw, and determined to replace these bulky materials by small applications of concentrated manure. He began with wheat, and sowed it with 12 cwt. of rapecake per acre; then followed potatoes, selling all off as usual; then barley, then clover, which he removed and sold off as before; then rye, to which he however applied farmyard dung; then oats; then clover, ploughed up and sown with peas and flax. And by thus acting he made money—sometimes as much as six pounds per acre English being realized by this sale of his produce. He did not, however, confine himself to rapedust as a manure: he applied bones at the rate of about 9½ cwt. per acre, and ultimately used Peruvian guano, which he found reason to prefer to either of the above applications. The only manure he had seems to have been that of a couple of cows; for he appears to have sold off his horses annually in winter, and then says by these means he made farming a profitable concern.

But after all, did he not apply every element of these plants?—carbonaceous and ammoniacal matter in the rapecake, phosphoric and ammoniacal in the bones, and both in the guano? And keeping clean, and being a granitic subsoil, continually dissolving out its elements, with a soil mechanically favourable to the growth of crops, and indisposed to the rapid propagation of weeds, M. Rotshke

was enabled to make profit of what would easily have ruined others.

Professor Way says: "Now, although it has been a constant axiom, in the instruction of chemists and farmers, to 'return to the soil what the crops remove' —and every candid agricultural chemist will aver that at the outset of his career he has somewhat overrated the importance of literally fulfilling this obligation— it is certain that most soils of fair quality contain an amount of the different mineral substances far greater than is necessary for many succeeding crops of the most impoverishing character."

Taking, however, the leaves and the roots of plants as the great means of appropriating food, we cannot help arriving at the conclusion that it must be important to give as great an amount of vigour as possible to those organs, and hence that a *ready supply of highly soluble manure in the first stage of a plant* is one of the very best means of supplying the substratum of a future abundant crop.

Still there are evidences that the compounding principle—the application of pounds and ounces of mineral and other elements of plants—is not without its force and value, and some of the facts and analyses of Mr. Hemming go very far to show that there is some truth lying between the two extremes of doctoring the land by the scales of the chemist, and allowing the soil and atmosphere alone to do all that is necessary for a farmer's crop. Where exactly the medium lies, we are not at present quite in a position to judge; but we would desire to place the facts as they occur, tending which way soever they will, before our readers, and stripping them of as much of their mere theory as is possible, for their assistance.

There can be no doubt that parties who wish to keep a debtor and creditor account with their soils, should first know the organic and inorganic materials such soils contain, and also what is available as well as what the crops actually abstract. Nor can all they apply be absolutely useful to the plants to which they intend to render assistance. Much as the roots will often permeate the soil—vast as are the powers of appropriation possessed by a variety of plants, they cannot accomplish impossibilities; and it seldom happens that the whole mass of roots, how ramified soever they may be, will even comprehend the whole of any soil whatever. The solution and evaporation also of the manure applied will often sadly baffle the skill of the party applying a mixture, so as generally to render it necessary to give the soil much more manure than is scientifically shown to be necessary for the growth of the plant, judging of its contents as appreciable by the scale.

To do fairly by a soil, it either ought to be so thoroughly denuded of manure to begin with, as to represent its natural condition, and so have a knowledge either of the elements or the deficiencies of the soil, or it ought to be first put in a sound and *equal* state as regards production.

The latter is far more easily ascertained than the former, as one or two specimens will not always indicate the exact condition of the soil, as regards at any rate its fertility or composition. But the eye will be a guide, as accurate as almost is needed, to ascertain the precise state of the land when it is in good condition. It is not always easy to get land of certain descriptions clean without an open fallow, while the same soils can easily be kept clean without the intervention of that vexatious accompaniment of cultivation. When a field presents a crop *all alike*, no thinner or thicker, nor unlevel places, it is usually up to the mark in its fair average productiveness. It is the crop which is thin here and thick there, which is tall in one place and short in another, which is heavily lodged in one part and very stunted in another, which manifests a low state of cultivation. Get it once ready for the trial, and let it have a liberal allowance of the materials indicated, and it may be measured by the scale and weight for some considerable time.

But to imagine a soil can carry out year after year the hopes of the farmer, without applying all the constituents of the crops, is a simple absurdity. To apply part—say the inorganic—and leave the atmosphere to do the rest, is so unsatisfactory, so certain of failure sooner or later, that it is a folly to attempt its commencement.

The most striking fact we have seen, as applicable to the question of weight and measure, is that mentioned by Mr. Edward T. Hemming, in the Journal of the Royal Agricultural Society of England. He manured a three-acre field in the autumn of 1846, at the rate of twenty tons of fold-yard manure per acre, and sowed the land with rye for the soiling of the following spring and summer. It out-grew the wants of his stock, and while a part was consumed green, the rest ran to seed and was harvested in the ensuing May; about one-half of the land was subjected to each process.

The crop in both cases was particularly heavy. The soiled part of the field was then ploughed, and sown with globe turnips, and had given to it an application of three hundred-weight of Peruvian guano per acre. Of course, as may be supposed, the turnips after such applications would be excellent, and so they were. Mr. Hemming does not mention whether the turnips were pulled off, or eaten on the land; but we infer they were pulled off. The whole field—the part which had borne two green crops, and the part which had borne only one corn crop—was sown with beans in the following spring.

The difference in the bean crop was very striking; the part where the corn crop had been taken off being far superior to that where the grain crop had been grown. But when six inches high, the beans stopped all growth in the green crop parts, and never seeded; while the remainder of the field grew the beans in a state too luxuriant.

Here was the astounding fact that two crops which did not mature their seed, absolutely prevented a crop from coming to maturity at all, while a corn crop which did, left the land in very high condition. And to explain this, Mr. Heming makes a debtor and creditor account in two tables, far too elaborate and extensive to insert here; but he debits the land with the manure, seed rye, seed beans, on the one hand, and credits it with the crops produced, and shows *surplus*, or as he describes them plus (+) quantities of silica, potash, lime, magnesia, oxide of iron, chloride of sodium, phosphoric and sulphuric acid. He follows the same course as regards the other portion of the field and though the plus quantities of some materials may not at first sight strike the observer as very different in kind, they certainly do in quantity. Taking potash for instance, there is a difference of 84 lbs. per acre, a considerable quantity by the one over the other rotation; or, as he says, "in other words, the soil would have to supply 84 lbs. of potash in addition to that supplied by the manure, in order to grow a crop of beans, whereas in the rotation where the rye was allowed to stand for seed there was a large excess of potash and a sufficiency of nitrogen."

We have given the above as a sample of the bearings of the question, and it is at any rate worthy of attention and consideration; but we as yet know far too little, and have too few facts on which to theorise, to indicate any definite course to be adopted in reference to the ledger account of the abstractions and additions to a soil, or to define with any degree of accuracy the quantities required for any particular crop.

It is always a good rule, however, to err on the safe side, and give plenty. In all artificial manures the application should never be stinted. Not that we advocate excessive quantities. We do not think it advisable, for instance, to give more than 4 to 5 bushels of dissolved bones per acre, at one application; we prefer that quantity with an allowance of manure, to all others, how much greater soever they may be. The *proper* quantity rather than the excessive is always the most economical, and the variety of manures will uniformly tell against quantity of any one kind. Perhaps the combination of farmyard manures with those of a phosphate and ammoniacal character is always the safest.

TURNIP-HOEING.

Turnip-hoeing, or singling turnips with the hoe, is perhaps one of the nicest manipulations in the art of agriculture, engaging equally the mind, the eye, and the hand. The best plants should be left, and at equal distances from each other. Weeds should be eradicated, and the earth carefully removed from the young bulbs, but the roots on no account disturbed, while the earth in which they spread should be left free from pits or hollows made by the corners of the hoe, presenting thus the best surface for resisting drought, and yet gaining at the same time the full influence of the atmosphere and night dews—conditions by no means easily observed, under all the circumstances of the case.

Few seeds braird more irregularly than turnips, owing to the nature of the season in which they are sown, and their own constitutional character. They require, for instance, a peculiar modification of heat, moisture, and air, to make them vegetate; which when obtained, they braird readily, but otherwise will lie days, weeks, and months, and yet afterwards make their appearance. Again, after a braird has been obtained, there is no plant subject to more calamities in its infant state than the turnip. Even when it has got into the rough leaf, it is liable to various complaints, of which we know comparatively little beyond the bare fact that at this stage it often lingers in a sickly state for many days together, during which it is almost impossible to say what will be the issue, whether death or life. Under such circumstances, it is often no easy matter to determine, when the hoe hangs over the heads of two plants, which should be left and which removed; for although one may appear more debilitated and less promising than the other, it may yet have got over that trying stage of its complaint, which the other has not arrived at. It but too frequently occurs that both are swept away in the process of hoeing, not intentionally, but because they are unable to withstand the rough treatment of the hoer. So long as the whole field remains sickly, singling may be deferred; but convalescence is invariably very unequal—a friendly morsel of dung, or the like, administering relief to some plants; while the roots of weeds victimize others, robbing them of any scanty supply of nourishment which they otherwise might have enjoyed. After they do start, they generally push away vigorously, if the ground is in a favourable state; hence the bunchy appearance which they present, those in advance

"drawing up" each other, as it is termed, thereby demanding the hoe before those not recovered are well able to bear it. It is not, however, always the largest and healthiest plants which should be left, whether in the bunches or not; for such are frequently the most degenerated and worthless as to quality—plants having coarse deep roots, and small bulbs, with large coarse tops. They are generally, however, inviting specimens for the hoe of the beginner to choose, standing well up to its rude treatment—occupying frequently also a prominent place, having established themselves like wild mustard where others have sunk from a lack of moisture and food. Quality, therefore, ought to be carefully discriminated; and between sickness on the one hand, and an extraordinary exuberance of health (if we may call it) on the other, the task, we repeat, is by no means an easy one to accomplish.

Horse-hoeing usually precedes hand-hoeing, under the ridge system that now generally followed, forming an important auxiliary, if the work be properly performed; for, when such is the case, the work of hoeing is much lighter. The coulters should be set as wide as possible, not to injure the young plants by throwing earth upon their leaves, or loosening their roots, both of which are against the process of singling. In dry weather the work is easily performed, but in wet it is otherwise; for when weeds predominate, as they then generally do, it is sometimes necessary to precede the horse-hoe with the paring-plough (we have frequently used the common plough to keep down charlock), running one furrow up every drill in the first case, and then reversing the furrows in going over the field the second time, thus subjecting weeds to a twofold death—twice burying them, as it were, or oftener if necessary—when the horse-hoe or scuffle may follow in a few days, or as soon as the weather will admit, going a little closer to the plants.

Turnip-hoers either work by the day or by "task," generally the latter, unless where engaged by the year, at so much wages, without reference to specific portions of work done. In laying off task-work, it is usual to allot so many drills to each hoe, as the forward state of the plants will admit, at so much per drill. Members of a family, or parties fond of gossip, frequently solicit to be allowed to club together; but a prudent master always separates them, so that the work of each appears by itself. Members of a family may hoe next to each other, yet separate, forming one account. Where good work is made, there is no occasion for reproof; but where bad, the necessary correction can be more satisfactorily given singly than otherwise, and the labours of the field controlled. Hoers are never wholly deaf to "common sense," as they themselves would term it, if practically administered; and the only successful mode of reaching their conviction at times is to take their hoe, and show them that what you demand is easily done. Where the work is done by the day, the hoers work together, under the control of a foreman, sometimes taking on two drills each at a time, and at others only one. In the former case, they are more at liberty to pass each other; but are apt to trample the first hoed drills in hoeing the second uprooting, and otherwise destroying many plants; so that the latter is preferable, where the hoers are taught either to reverse the position of their hands and feet when required, or to hoe backwards—changes easily learned, and which always ought to be so. We have sometimes experienced a difficulty in getting old hands—men much more so than women—to throw aside their confirmed habits, such as to do with the right hand and foot what they formerly did with the left. But we never had any difficulty in teaching them to work backwards when that failed—a movement which, although it may not look so plausible in theory, is yet equally easy and effective in practice. In point of fact, those who learn to hoe with the right hand as the left change hands at every hundred yards or so—a practical proof of the soundness of our conclusion.

The *modus operandi* in turnip-hoeing is a lesson which few learn aright. For "ever prone to take the opposite course from right," beginners at the commencement get into all the awkward habits imaginable, both in handling the hoe and standing, out of which it is scarcely ever possible afterwards to move them; and what renders their case the more anomalous is the fact that, if you stand behind fifty in a field, as we have done, you may not perceive two of them following the same theory of action. One, for instance, keeps thrusting with his hoe, driving weeds and everything from him, as if the hoe and the steam-hammer were governed by the same laws of motion; a second keeps hacking—drawing everything to him; a third, straddling over a drill with his elbow leaning on his thigh, his hoe on his knee, and with his back almost bent in a horizontal position, keeps scratching away in this slovenly attitude, sometimes with one corner of his hoe and sometimes with another; and in this manner you may go over the whole number without finding two alike. In the manufacturing and commercial world such an awkward state of things is never exemplified; for there hundreds of workmen uniformly move together like clockwork, all governed by one theory of action, their left hands being equally well informed with their right. Why should it be otherwise with farm-labourers, and even farmers' sons? Why should they be deformed with low shoulders, as frequently seen from continually lifting with one hand and pressing down with the other, in working the spade or any other implement acting on the principle of the lever, where one hand is the fulcrum and the other the power? Why should they not learn to use both hands alike, and also both feet? The obvious answer to all this is, a want of inquiry—a rooted aversion to science, coupled with the fact, that the majority are, in a great measure, self-taught. During infancy, for instance, they learn to do things with one hand without restraint; becoming thus "right handed," or "left handed," as it is

termed. When boys, they handle the hoe accordingly, as if it were the duty of farmers to confirm the bad habits of childhood! At first the hand is never steady; so the first lesson is, "Don't be afraid." Consequently, the boy or girl lets fly at two plants either with a "push" or a "hack;" and if he or she succeeds in separating the one from the other by either, it is a won game, and they abide by the method, which ever of the two it is. If they fail, they must bend the back, straddle a drill, steady the hoe on the knee, and begin again. All have practical reasons of this kind for their awkward methods—being taught by experience. But we cannot enter upon the details of fifty bad methods—our limits not permitting us. The grand question at issue is, not how many bad methods turnips may be hoed in, but what is the best.

In hoeing, the hoer should learn to stand erect; for a stooping position of the body is not only a painful one to work in, but one in which he has less muscular power. It is true that when the arm and hoe rest upon the thigh and knee, the reverse may be the case, for then the weight of the body may be thrown upon the hoe—it in this case becoming a lever of the second kind, instead of the first, second, and third, as it otherwise would be. But the gain here is at a sacrifice of muscular action, while the greater power is, in nine cases out of ten, misapplied; for, first, the resistance should be equal; for if greater, then it may balance the greater power, and if less the power may be equal, which is contrary to hypothesis. Now if a greater *power* is applied to produce an equal effect, there must of necessity, be either a waste of it or of *time*. But the times are equal, for falling behind in the number of drills is falling short of pay. Hence the obvious conclusion. The bodies of those who hoe over the knee keep rocking like bad-going cradles. In practice the resistance is generally greater, the hoe pressing more perpendicularly into the soil in pushing off, thus levelling the drill more, and not unfrequently making pits. Of the details of the over-knee action more after. The feet should stand in one drill, or between two rows of turnips, the leading foot nearly parrallel, the other oblique, bringing the front rather more than half way round to the work or plants in being hoed, so as to give the muscles of the arms, especially the one farthest from the work, the greatest power in pushing off, which cannot be given when the hoer straddles over one row with his right or left side to the work, for then there is no alternative but to lean on the knee, rocking over the foot as a fulcrum. If hoers would learn to stand in the position thus recommended, they would not only find it more easy for themselves, but better also for performing quantity and quality of work. We speak from nearly thirty years' experience, twelve of which were spent as foreman, hoeing the leading drill in a large field, under a kind father but hard master. The hoe should be held firmly, rather than loosely, yet so as to leave its action free from being cramped in any manner. It has two principal motions across the drill, the one pushing off from the line on which the plant is growing, the other drawing; both should be gentle or uniform, free from thrusting or hacking, and in both the cutting-edge or mouth of the hoe should be carried level. In performing these motions the effect produced on both sides of the plant should be equal, consequently the action of the hands must be very different before such a result can be obtained, owing to the position of the hoe. If, for instance, we suppose the hoer working with the right hand lowermost, then, in pushing, he lifts the mouth of the hoe, or raises the right hand a little, lowering the left at the same time, so as to remove an equal depth of soil, while in drawing a slight pressure is given with the right and elevation with the left, so that the two are opposite to each other. When the land is dry, free from weeds, clods, or stones, and where the plants come up regularly, and not too thick, the work is soon learned, and as easily performed, requiring little strength; for the plants selected fall over as the hoe comes close up to them upon the hoed ground, leaving the unhoed separate, so that the alternate horizontal motion of the edge of the hoe is all that is required to make good work. But when the land is wet, adhering to the hoe, full of weeds, clods, and stones, and the plants spindling among weeds or in bunches, it is otherwise, being neither so easily performed or so soon learned; for then various other motions of the hoe are required in addition, to perform the same result. The hoe, for instance, is best kept clean in wet weather by a knife, made for the purpose, which may be carried in the vest pocket or top of the "leggin," where such are worn. Weeds frequently entwine themselves around plants, preventing them from "falling over" or "singling," as it is termed, when a separation has to be made by the corner of the hoe, which may be done in various ways, according to circumstances. Sometimes the corner is easily run in between the two, and a separation thus effected either by a gentle draw, push, or pressure; while, on the other hand, when the roots of the weeds are so entwined around those of plants as to pull up both together, it is very different. In such cases the former must be cut as low as possible with a slight drawing-cut by a turn of the hoe-handle, thus making the corner of its cutting edge revolve around it as its axis, as it were, the drawing-cut in this case being in the line of the edge of the hoe, and not across the drill, as in ordinary cases. When the plants spindle they frequently fall over double and treble, instead of single, when it is better to touch them on the tops with the blunt corner of the hoe, as if to raise them again, when a separation will generally take place, than to attempt putting the corner of the hoe between them, for they frequently entwine themselves around each other, so that by the latter you not only take more time, but run a greater risk of pulling the whole out. Sometimes, however, when the roots are very feeble, instead of a touch with the corner of the hoe, purposely to separate the tops doing so it only separates the roots; when the weakest of these may then be cut by a revolving stroke

of the corner of the hoe, as above, leaving the strongest one with the others still adhering to its top, from which they will soon fall away as they wither and its leaves expand and rise. In either of those examples, both that of the weeds as well as the doubles, the singling should be effected before the hoe proceeds further along the drill, so as to avoid blanks; for if the open spaces on both sides of the plant be first hoed, and the plant then rooted out in the singling—as is frequently the case under the most careful and expert hoer—the roots of the plant selected being cut by worms, or otherwise imperceptibly destroyed, then there is a blank; whereas if the reserve we propose is adopted, the space on the one side may be only an inch or two wider when that on the other may be as much narrower, thus leaving an acre with its proper number of bulbs. Clods and stones are great obstructions to the hoe, especially when accompanied with weeds, rendering it more difficult to carry the edge level and to perform the other manipulations in hoeing.

It is the above class of difficulties which induce beginners to work the hoe over the knee; for until once full command of the hoe has been acquired, it is no easy matter singling turnips and removing weeds in such cases. For instance, we have stated that an equal effect ought to be produced on both sides of the plant (*i. e.*, the ground left equal in curvature); and that the edge of the hoe ought, consequently, to describe similar lines, or have the same motion in "pushing" as in "drawing," but that the action of the arms was opposite in effecting these: more practically speaking, that the beginner should learn to single in drawing as well as in pushing, on the ground of less toil, more expedition, and better performed work. But before he can do so he must learn the proper action of the arms; he must learn to use the handle of his hoe as a lever of the first, second, and third kind in pushing and drawing, making his right and left hand the fulcrum, as required, so as to describe the proper line with the edge of the hoe on both sides of the plant. But he, unfortunately, is altogether a child of experience, knowing nothing of levers, fulcrums, and lines; for all that he knows is, that when he leans his hoe on his knee he can hold it the steadier—that when he puts the flat of his hoe on a bunch of turnips it presses down or off the tops, separating those so pressed from those not—and that by pressing down the handle as he gives his knee a hitch forward he can do the work which gains the pay and pleases his master. If the first hitch does not single a turnip, a second is made; and in this manner the off side of the ridge or drill is hoed along with the process of singling, when the hoe is lifted from the knee and the near side hoed by a few hasty "hacks," removing the weeds, and leaving the whole in a passable appearance behind, when another hitch or two is again made.

We have said that *the best plants should be left at equal distances in the rows*, which is sound in theory but impossible in practice; hence the rule in hoeing is to "borrow and lend," leaving as nearly as possible the desired number to each acre. The selection of good plants is of the greatest importance, and these are rarely to be found at equal distances. For example, if Theory says "fourteen inches between mangold plants," the best plants are never thus found; hence Practice reads the rule thus—"leave one plant in every fourteen inches as nearly in the centre as possible." And to carry out such a rule requires a discriminating eye and careful hand. When the manure is dibbled the plants grow in bunches, so that the best of each should be left. Such require to be as early singled as possible, or their roots will pull out the manure, especially undissolved bones when dibbled.

TIPTREE HALL FARM.

It is still a question how the agriculturist should regard the Tiptree Hall experiment. Cameleon-like, when you think you have it in one light, it straightway comes before you in another. When you determine to deal with it gently and briefly as the plaything of a hospitable citizen, you are gravely assured that it is no such thing. The Tiptree Farm is no rural villa, where a man may disburse at his pleasure a portion of the means he has made elsewhere. It is simply another matter of business—one of pounds, shillings, and pence—conducted with the strictest reference to profitable return, and as such only to be considered. And when you proceed in obedience to orders to consider it so—to ascertain whether everything you see or hear of does work on so surely to the right side of the account—"lo! now 'tis blue!" Recollect, if you please, this is the hobby of an amiable enthusiast, "who is doing the best he can to elicit the powers of the soil without any especial reference to profit or loss."

No wonder, then, if the simple-minded working farmer feels somewhat tired of a subject that is so continually shifting its phases, and so systematically defying anything like tangible proof. Tiptree at one time is an example *to* him; and when he is seriously advised to follow it out, 'tis only an experiment *for* him. In either of these points of view the agriculturist might ere this have been taught to regard it. Just at present, however, there is little anxiety shown as to whether he regards or not. Mr. Mechi asked him to believe all he heard, and to

do everything he was told. That was the understanding on which they first came together. When though, the pupil rather demurred at going so fast—when he asked awkward questions and found out awkward facts—when it gradually came to this, Mr. Mechi at once threw him off. As he handsomely put it, at his own gathering on Wednesday, July 21st—"Was it likely that he should go and consult the old watchmen, when he was about to form a new police?"

"This meeting," as a significant N.B. to the invitation, annually informs us—"This meeting is strictly agricultural." That is to say, the man who receives it may count upon meeting a number of the most eminent agriculturists in the kingdom. With these will he go round the farm; and from these, more especially, may he expect to hear, in the course of the evening, what they think of that they have seen. We can remember when it was so—when "this meeting" was "strictly agricultural." It is such no longer. In the some three or four hundred visitors the agriculturist is now but the tithe, or the exception; while in the authorities to be heard and to be depended on, he is nowhere. The farming at Tiptree is declared to be wonderful, and the luncheon excellent. But we don't hear this from any brother-farmer: it is not he who points out to you the strength of the wheat-crop, the goodness of the clover-lay, or the promise of the turnips. "The old watchman" is superseded at last, and you have the new police instead. The very *new* police, we may say—excellent, and even renowned men in their several lines, but who know just as much about practical farming as D. 23, who has a beat this side of Temple Bar. Let us number up, as well as we can remember them, some of the more prominent speakers on Wednesday last:—Mr. Gurney, Captain Peel, the Mayor of Gloucester, Mr. Chadwick, Lord Ebrington, Lord Kinnaird, Lord Harrowby, and Mr. Waddington, the chairman of the Railway. These were the gentlemen of the jury that tried once more the Tiptree Hall Farm; and they found it super-excellent. We bow, of course, at once to their authority, and go to do likewise, remembering, as we do go, the safeguard we have to act on—that "this meeting is strictly agricultural."

There is no forgetting, however, as we view all these wonders, that in the words of Mr. Gurney, "Our friend has another good farm in the metropolis." We have heard a mere farmer accused of coarseness when making the same remark, but it was very well received on Wednesday. Of the other speakers, Lord Kinnaird was kind enough to say that if we would only took a leaf or two out of Mr. Mechi's book there was no occasion to travel north. Mr. Chadwick and Lord Ebrington of course repeated their last year's addresses on liquid manure. The Mayor of Gloucester, like the apple in the dumpling, began by admitting his surprise as to how he got there—the "strictly agricultural" caution no doubt running through his mind at the time; while Captain Peel, in returning thanks for "the Navy," and the allusion made to his own family, did so in a little speech that we never remember to have heard excelled for the good taste or nice feeling with which it was given.

We do not wish to dispute the goodness of Mr. Mechi's intentions, no more than we would that good-humoured tact with which he proceeds to them. But we want to know a little more clearly what these are, or what position he really means to occupy? In expressing this desire, we do not see that we should be restrained by any notions of false delicacy. The good and bad in this world are pretty evenly distributed. If, according to his own showing, no man has been more wantonly abused than Mr. Mechi, no man is, or has been, more outrageously puffed. The give and take here has been fair enough, and "the Balance Sheet" and "the Watchman" very nicely weighted one against the other.

In, then, his own postcript—the very essence of a letter, as we are told—are we to write the Tiptree Hall gathering as "strictly agricultural?" Are we to expect for the future to see the meeting made up at least for the most part by those strictly agriculturists? Or are we to see it go on, as it is now growing, into a mere holiday for learned gentlemen from London? Is it to be "science with practice," or science only? And is the award to be made solely on the dicta of Professor This, or Mr. Commissioner That? or shall Philip Pusey, Jonas Webb, William Hutley, or Fisher Hobbs be requested to take as prominent a part in the decision?

It was curious and amusing, indeed, to notice how this strictly agricultural meeting was made up; and we must give Mr. Mechi the credit for affording us the best opportunity of doing so. About half an hour or so before dinner, the visitors began to assemble in front of a railed-in yard, in which stood the host, and Mr. Harker his toast-master. The sportsman will gather the best notion of the scene from a kennel of hounds at feeding-time. One by one the guests were drafted in by name, the "dainty feeders," of course, being first called. Now and then as they passed on, you caught a glimpse of one of the old "Watchman" sort, as

they are here known; but they were greatly outnumbered by the more showy Townsman, Trumpeter, Theorist, and so on—hounds that carry some head, and give a deal of tongue, but that are terribly apt to run riot at times.

Putting the "strictly agricultural" almost entirely out of the question, the meeting was really a most entertaining one. We should counsel such of our friends as may be honoured with invitations to take care to avail themselves of them. There is an agreeable walk to begin with; one of the most tasty cold dinners we have ever sat down to, an equally good dessert; and an afternoon not all consumed in declamation. After a speech there were glee-singers "from the London concerts;" close on another oration, a comic song by a well-known gentleman from the West End. Then a neighbour delivered himself of a really capital bit of doggrel, written specially for the occasion. Encouraged by the reception of this, another friend, more in the sentimental way, got Mr. Leffler to sing another "original," which, by the masterly aid of a young lady with her harp, went off well enough. The poet, however, was so far indiscreet as to have copies of his composition distributed amongst the company. We will not say much for his muse, but his foot-notes are certainly good. Indeed, we cannot do better than conclude with one of them, leaving, as it does, our worthy host in very good company, and clearly defining those whose names

"Time must take care on his wings to emblazon."

Here comes the *, and then follows the note:—

* "*Prince Albert, the Duke of Richmond, and Mr. Mechi* have acquired deserved celebrity for their unceasing exertions, spirited enterprises, and numerous practical experiments, in promoting the cause of agricultural success and prosperity. Every impartial and unprejudiced mind must admit their object to be *pro bono publico*."

"Prince Albert, the Duke of Richmond, and Mr. Mechi"—could we say more?

HERTS AGRICULTURAL SOCIETY.

The "Drainage Match"—announced, at least, as under the auspices of this Society, though more immediately in the hands of Mr. Bailey Denton—took place, according to previous notice, on 22nd July. The field selected for the trial was a stiffish clay on the estate of Mr. Perkins, and within two miles of the Stevenage Station. The entries—considering the great demand there is just now for agricultural labour—were most encouraging to the promoters of the undertaking; while the work was declared by many competent judges present to be some of the best ever seen. The contests, in fact, between the different "gangs" were all very close, and all as deserving of the commendation they received. The depth selected for the test of a good drainer was four feet, and the result was made to depend more upon the perfection of the work than the rapidity with which it might be got over. The prizes—delivered in the field by the Rev. Mr. Bloomfield—went first, second, and third, to Huntingdonshire men; a fourth, or extra prize, being given to a Lincolnshire gang, whose labours were certainly in every way worthy of it. There were, in addition to these, other workmen, from Bedfordshire, Peterborough, and elsewhere, all of whom were liberally remunerated for their exertions. The experiment was altogether a most successful one; while its moral may be gathered from a remark of one of the vanquished: "I should like to have another trial to-morrow," said he to one of his employers; "for I can see where I was wrong to-day, and I think I could do as well as any of them another time." Here is a good man made something like a perfect one by a single lesson, which, if properly repeated, cannot benefit him more than it will those who have to seek his services.

At the conclusion of the award, the majority of those present proceeded to the residence of Mr. Denton, where lunch had been provided for the occasion. Consequent upon this, arose an interesting discussion, introduced by Mr. Denton himself, and supported by Mr. Bullock Webster, Mr. Hewitt Davis, Mr. Livesey, and other gentlemen more directly connected with the county. This turned, of course, on the merits of deep and shallow drainage, the existence of a "water table," and, perhaps more particularly, on the duties of Government Inspectors appointed to control or sanction the outlay of money borrowed for draining estates. The limit to which this supervision extends was explained at some length by Mr. Davis, himself one of these inspectors; and from whose statement it appeared that these gentlemen have no power to enforce any especial system, but merely to report as to what they may consider will be effective or non-effective, and so determine the answer to applications for assistance.

The trial thus brought to so successful an issue is almost entirely attributable to the exertions of Mr. Bailey Denton, who, in this instance at least, originated the experiment and provided the prizes. While allowing him every credit for the opening he has thus made, we think that for the future it would, indeed, be hardly fair to let all the labour and expense rest on him. We see no objection, but rather every reason, to warrant the "Drainage Match" coming henceforth more thoroughly into the proceedings of the Herts Agricultural Society.

HIGHLAND AND AGRICULTURAL SOCIETY.

The half-yearly general meeting of the Society was held on Wednesday, the 13th July, at one o'clock, in the Hall, 6, Albyn-Place, Edinburgh. The Right Hon. Lord Dunfermline occupied the chair.

New Members.

80 gentlemen, 43 of whom are tenant-farmers, were balloted for, and admitted as members.

Premiums were awarded to the following parties:—

1. To Colonel M'Douall, of Logan, £20, for a Report of Experiments on different kinds of food for Cattle, conducted by Mr. David M'Culloch, Auchness.

2. Mr. George Hope, Fenton Barns, East Lothian, the gold medal, for a Report on the feeding qualities of turnips raised with farm-yard manure and with guano.

3. Mr. James Porter, land steward, Monymusk, Aberdeenshire, the gold medal, for a Report on the same subject.

4. Mr. John Lockhart Morton, land agent, Edinburgh, the gold medal, for a Report on the cultivation of field cabbage.

Agricultural Statistics.

Sir John M'Neill said that at a former meeting he had the pleasure of reporting that the Government, yielding to the repeated applications which the Society had made, had determined to take some steps towards collecting agricultural statistics. In pursuance of that resolution, an arrangement was entered into between the Board of Trade and the Society, by which they were authorized, and they undertook, to collect the agricultural statistics of three selected counties—East Lothian, Roxburgh, and Sutherland. The meeting would remember that the directors had recommended, and that they approved of the resolution, to collect these statistics through the agency of the tenant-farmers. It was obvious that in entering on such an undertaking they had, to a very considerable extent, to stake the credit of the Society on the success of the experiment; and it gave him great gratification to report that the confidence with which the directors relied on the intelligence and public spirit and integrity of the tenant-farmers had been amply justified. They had not only maintained the credit of the Society, they had done more—they had put the Society in a position which proved their case clearly, and in a position of rendering still more important services to the country generally than perhaps they had previously got credit for ability to perform. The inquiry which they had thus undertaken was necessarily divided into two parts—the one having reference to the extent of land under each variety of crop, and the amount of stock; and the other, for which the season had not yet arrived, having reference to the amount of the produce. The President of the Board of Trade expressed a hope that the first part of the inquiry might be completed by the middle of the present month. The directors had the gratification of reporting to the general meeting their compliance with this desire, and the successful conclusion of this part of the inquiry in the three selected counties. There were certain returns yet due; but the number was trifling, and the causes of delay had been satisfactorily accounted for. In Roxburgh there were issued 1,282 schedules, of which five were not returned; in East Lothian there were issued 518, of which only one was not returned; in Sutherland 202 schedules were issued, of which two had not been returned. The total number of schedules issued was 2,002, and the number returned was 1,994, leaving only eight still due. The Sutherland returns further comprised the particulars of 2,667 crofts. The returns in Roxburghshire were complete, with the exception of five cases, which do not among them represent a rental of £90. The single exception in East Lothian would be filled up immediately, and it presented the only instance of a direct refusal to give information. The two blanks in Sutherland the secretary was in daily expectation of completing. The returns from all the counties included a note of the cattle, horses, or other stock belonging to villagers or townspeople who did not occupy land; and that from East Lothian further contained a statement of the steam and water power applied to agricultural purposes. It afforded the directors great pleasure to report that the confidence with which the society relied on the good sense and integrity of the tenantry had not been misplaced, and that the appeal made for their co-operation and assistance in this matter had been cordially and promptly responded to. As had been stated, only one direct refusal had been received. In other five instances the application of the enumerator, followed by that of the secretary, had been disregarded, and the information required had been obtained from third parties. With these exceptions, the whole of the returns had been voluntarily rendered. At first, the nature and objects of the inquiry were by some misunderstood, and the secretary found it necessary to hold meetings at different places for the purpose of affording information. The directors felt much indebted to the tenantry, not only for the readiness with which they met the secretary on these occasions, but for the liberal manner in which they received his explanations. The principal difficulty experienced was a repugnance on the part of the sheep-farmers in some districts to make a return to any local enumerator. It was gratifying, however, to the directors to find that, where such objections were entertained, the parties had such confidence in the society that they readily consented to send their returns directly to the secretary. It was proposed to lay the results of the inquiry before the Board of Trade, as soon as they had received the approval of this general meeting; and no time would be lost, after harvest, in proceeding to estimate the produce of the crops. It would be the duty of the Directors, at the termination of the inquiry, to submit to the Board of Trade various alterations on the present machinery, with the view of promoting the simplicity and efficiency of any general measure that might be adopted. This was not the proper time to consider such suggestions—they were merely alluded to, to remind those who had criticized different details of the inquiry as now conducted, that it was strictly experimental, and was instituted with the view of ascertaining the objections which must be obviated, as well as the facilities which were available, in carrying out the object in a more extended manner. They were, therefore, now in the condition of complying with the wishes of the Board of Trade, and had completed the first part of their undertaking. It could not be expected that such an inquiry could be conducted without exciting in the minds of some less or more

diffidence and jealousy; and it did sometimes happen that the objects of their inquiry were not perfectly understood; but the Secretary of the Society, to whose zeal and ability, and to whose admirable tact, they were greatly indebted for the success of the inquiry—in fact, he was satisfied that in many places they would not have succeeded, but for him—was able, by calling meetings of the farmers, to explain the real objects of the inquiry; and this had led to the unanimous co-operation of which they now saw the results. He might mention that experience had taught that there were some defects in the schedules—that there were some other questions which it was desirable to put, and some that might be omitted; but that was to be expected, and these defects would at a future time be remedied. He thought they might take credit to themselves for having been the first in the United Kingdom in pressing for this inquiry, the public value of which had been satisfactorily shown. He expressed the thanks they owed to the tenant-farmers for their cordial and active co-operation, and to the enumerators chosen from amongst them, who had shown so much intelligence in the matter; and he trusted that, with further experience, they would be able to furnish them with a mass of agricultural statistics connected with this country such as no part of the United Kingdom had yet been able to furnish.

After some remarks from Mr. FINNIE, of Swanston,

The Secretary was instructed to send to Mr. Cardwell, President of the Board of Trade, an abstract of the returns which had been collected.

ORDNANCE SURVEY.

Mr. MAKGILL, of Kemback, said there was another subject of great public importance, which had occupied, during the last half-year, much of the attention of the Board of Direction—he alluded to the Ordnance survey. Colonel Dawson, of the Engineers, had been appointed to make that survey, and the result was surprising. It appeared from his estimate that Scotland possessed 500,000 acres less than was supposed; and in the two adjoining counties of Ayr and Dumfries the discrepancy between the old and new calculations was no less than 800,000, which was nearly two-thirds of their whole extent. That fact was sufficient to show the absolute necessity of the survey being carried through with as little delay as possible. The Society was aware that, during the last year, the question of what scale the survey should be executed on had assumed a new aspect. He had heard it asserted that the Society did wrong in opposing the survey on the six-inch scale, and recommending a smaller one. The truth was, that neither the Society, nor the Board of Directors, nor the Secretary, ever recommended the survey to be made on a less scale than six inches. They had no reason to doubt the benefit and importance of the six-inch scale; but the opinion all along had been, that if a larger survey could be made, it would be attended with greater benefit to the country, provided they could insure to the country the possession of an accurate map on a smaller scale for general purposes.

After some remarks from Mr. Pringle, of Whytbank, who took an interest in the matter, and Sir John M'Neil, a report was agreed to and approved of.

WINTER SHOW.

Mr. FALCONER, Foxhall, reported the steps that had been taken in reference to the show of fat stock, &c., to be held at Edinburgh next winter. It has been arranged that the exhibition of fat stock shall take place on the 12th and 13th December, which allows sufficient time for the Christmas killing. A sum of nearly £300 has been offered in premiums for cattle, sheep, and pigs; and the Directors are in hopes that the opportunity thus afforded to feeders of exhibiting their cattle and of securing a good market will not be overlooked. The poultry, dairy produce, roots, and seeds, will be shown in the Corn Market on the 26th and 27th of December. These exhibitions will necessarily involve a heavy expenditure; and, unless they are to be in a great measure self-supporting, they cannot be continued by the Society. On this account the right of free admission, which was last year conferred on members at the Perth Show, and which will be continued next year at Berwick, cannot be extended to those winter exhibitions. The Directors particularly wish it to be understood that all persons intending to exhibit must make an entry with the secretary by the 1st of November. Copies of the premium lists and regulations, and forms of entry, will be furnished on application being made to the Secretary.

BERWICK SHOW, 1854.

Mr. WARDLAW RAMSAY, of Whitehill, reported that the usual preliminary arrangements were in a satisfactory state of progress for the show to be held at Berwick next year. The district more immediately connected with the show comprised the counties of Berwick, Roxburgh, and Selkirk, and each of them, at their respective meetings on the 30th of April, had voted, in aid of the premium fund, liberal sums to be raised according to rental. The assistance of the Northumberland, Border Union, Berwickshire, and other local agricultural societies, had farther been promised; while the mayor and other authorities of Berwick had evinced the utmost readiness to co-operate with the Society, and to promote the success of the meeting. Sir Hugh Hume Campbell had consented to act as Convener of the General Committee; and the directors had to acknowledge the readiness with which the Duke of Northumberland had granted them the privilege of erecting the show-yard on the Magdalene Fields, the most available site for the purpose in the neighbourhood. Looking to the high agricultural character of the district, the advantages which it possesses as regards railway conveyance, and the facilities which have been offered to the Society, the Directors anticipate a meeting of more than ordinary interest and importance.

THE CHEMICAL DEPARTMENT.

Professor ANDERSON said, he was at present engaged in testing the value of various sorts of green refuse—a subject which, so far as he knew, had not hitherto been properly examined. He mentioned this, that any member present who could do so might supply him with substances of this kind to analyze. He had also other investigations in progress in regard to the general properties of soils, and the action of sulphates upon them, which might lead to results of interest. He might mention, as a matter of general interest to the agricultural public, that he was at present engaged in an analysis of some sorts of guano from an entirely new locality—from an island which had been recently discovered, above twenty miles in length, and of considerable breadth, and which contained an almost inexhaustible supply of guano. The analysis was now so far proceeded with as to prove that it was certainly good and valuable guano; and, so far as he could understand from the statements made to him by the discoverers, the island was easily accessible, and likely to be of considerable importance in relation to the supply of guano.

The Secretary intimated the following donations to the library of the Society:—Transactions of the Royal Agricultural Society of England; Transactions of the Royal Agricultural Improvement Society of Ireland; Transactions of the New York State Agricultural Society; Transactions of the Lower Canada Society; Tables of the Trade and Navigation of the Province of Canada; the Albany Cultivator, U.S.; Morton's Cyclopædia of Agriculture; Mark-Lane Express; Bell's Weekly Messenger; Gardener's Chronicle; Chester Farmer's Herald; the Advocate, Dublin; Irish Farmer's Gazette; and the North British Agriculturist.

The SECRETARY further stated that he had received a letter from the Agricultural Society of Sweden, stating that their meeting was to take place in August, and inviting any members of this Society to honour it with their presence.

The business being terminated, Mr. RAMSAY, of White-hill moved a vote of thanks to Lord Dunfermline for presiding; and the meeting separated.

INDICATIONS OF FERTILITY AND BARRENNESS IN SOILS AFFORDED BY GEOLOGICAL STRUCTURE.—CHEMICAL CLASSIFICATION OF SOILS.

In Mr. Bravender's excellent essay on the natural indications of fertility and barrenness in soils, to which we have so often referred, the weakest part is that which treats of those afforded by geological structure. This arises from his having adopted the views respecting the relations between geology and agriculture, which were current at the time when he wrote, and which ascribed too much importance to the strata constituting the assumed surface of geological maps, and too little to the superficial deposits disregarded on those maps. Had he conducted a series of independent observations, unfettered by the conventionalities thus imposed by geological authorities having but a very slight acquaintance with agriculture, his sound judgment must have led him to very different conclusions. His fundamental proposition is that the surface of certain geological formations is composed almost exclusively of fertile, and that of others of barren land. From these views we are compelled to dissent, and to dissent, as we shall show hereafter, on the evidence of Mr. Bravender himself. The fact is, that there is every variety of soil, from the best to the most worthless, not only on every system or group, which Mr. Bravender calls a formation, but upon each of its subdivisions which constitutes a formation in the modern nomenclature of geology. In proof of this, we refer to the reports of the Board of Agriculture, in which whether the agricultural districts, into which the several surveyors divide the counties which they describe, be defined on geological or non-geological principles, a number of independent observers will be found making the same complaint, as to the difficulty of giving a general description of the soils of any extensive district, from the irregularity with which they are distributed, and the intermixture within it of numerous small areas composed of very different soils. This irregular distribution arises from two causes—variations in the depth and composition of the superficial accumulations; and the changes which take place, both vertically and horizontally, in the mineral character of the substrata assumed as the surface on geological maps.

Even where the superficial deposits are the thinnest, as a consequence either of original deposit or subsequent denudation, the rocks are, in most cases, covered with a soil mixed more or less with other matter than that which could have been furnished exclusively by the rock on which it rests. Where they are of moderate depth, they constitute both soil and subsoil; in their greatest devlopment they are so deep as to become the substrata also, and to exclude all direct influence of the rock beneath. There are certain districts, therefore, in which, from the depth of the superficial accumulations, no relations between agricultural and geological areas can be traced. There are others in which, from the thinness of those superficial deposits, agricultural districts, or districts with one prevailing character of soil, nearly coincide with the out-crop of the strata; and hence it was, that for some counties the agricultural maps appended to the reports of the Board of Agriculture were the first published geological maps of any part of England; and hence a partial accordance came to be assumed as universal. This accordance, however, only subsists while general views alone are taken: it vanishes when followed into details. It is then found as we have said, that on every formation there are soils of very different composition and of very different values.

In those cases in which the rocks have the greatest influence on the soil, it arises from the mineral character of the rock from which the soil is exclusively derived, or which is near enough to the surface to constitute the subsoil.

All rocks may be classified mineralogically as argillaceous, siliceous, and calcareous; and it is on these general mineral character, which recur again and again in all parts of the vertical series, and not on minor distinctions between the clays, sandstone, or limestones of different parts of the series, that the agricultural characters of extensive districts depend.

Soils, again, are all referrible to the three heads of argillaceous, siliceous, and calcareous. No soil composed exclusively of either of these earths is fertile; it is their mixture which constitutes fertility. Loams are intermediate in composition between the sands and the clays. The most fertile loams are those which contain a certain quantity of calcareous matter, and in which the sand and clay are so intimately mixed, and in particles of such size, as to produce that degree of tenacity on the one hand, and of friability on the other, which Mr. Bravender has recognised as essential to fer-

tility, pointing out certain characters by which it may be ascertained empirically.

This intermixture of the earths is to be found in soils covering rocks belonging to all parts of the series. On each there are fertile loams and clay loams, passing into the extremes of sterility as each end of the scale is approached, and as the soil becomes either pure clay or siliceous sand. In proof of this, which is directly opposed to Mr. Bravender's fundamental proposition, we would refer to the table which he has himself given of the prevailing agricultural character of the different rocks. The strata are arranged in horizontal lines, corresponding with the order of succession, and against them are placed three vertical columns, headed clayey, sandy, or rocky and loamy. The formations which are set down as fertile, are all entered in the loamy column; those that are barren, either in the clayey, or the sandy and rocky column. We find as barren in the clayey column —the London and plastic clays (what was then called the plastic clay is composed, by the way, however, chiefly of sand), the gault and the weald clays, the Kimmeridge and Oxford clays, the fullers' earth, the lias shales, and the coal measures. As barren, we find in the sandy and rocky column, the upper chalk, the greensand, the Hastings sand, the cornbrash, forest marble, and great oolite; the new red sandstone, upper and lower, and the magnesian limestone, the millstone grit, and the carboniferous limestone. In the loamy column are ranged as fertile—the lower chalk, and the greensand, the Kimmeridge and Oxford clays, the cornbrash and forest marble, the inferior oolite, the lias shales and marls, and the new red marls. What is this but saying that loamy soils are fertile, and siliceous and purely calcareous soils infertile, from whatever formation they have been derived, and on whatever formation they may rest?

The chemical composition, then, of the soil is of more importance, in estimating the productiveness of land, than geological position. Depth, however, is of quite as much importance as composition. A light sandy loam, for instance, three and four feet deep, and of uniform composition throughout, like those of the Hupping Hundred, in Norfolk, yields to analysis nothing indicating superior fertility, though it produces its seven or eight quarters of wheat an acre, with every other crop in proportion. A soil of the same composition, not more than six inches deep, is naturally barren upon a subsoil of sand, sandstone, or gravel, and moderately productive on a calcareous rock. With the increasing depth of the soil, the influence of the subsoil diminishes, provided it be not too retentive of moisture. At depths exceeding a foot, little difference will be found between soils of the same composition on calcareous and siliceous rocks.

The depth of the soil varies generally with the contour of the surface. It is least on steep escarpments and sharp ridges; greater on table lands, particularly if surrounded by higher ridges, gradually deepening upon long slopes towards the bottoms of valleys; and greatest of all on those low tracts bordering the coast, which are but little elevated above the alluvial deposits of rivers and estuaries.

The several articles wherein we have described from time to time the principles on which land is valued, have shown how the process is conducted under the general valuation of Ireland, and how it is conducted in England, by those valuers, who, like Mr. Bravender, make no secret of their art—who admit its imperfect state, and are desirous of improving it.

We have seen that in Ireland the basis of the valuation is the quantity of produce of which the land is supposed to be capable, that estimated produce being deduced from the composition of the soil, its natural vegetation, its elevation and aspect. We have seen also that this produce is monied according to a given scale of prices, modified by local circumstances, and that the proportion of this modified monied produce, allotted as rent, receives a further local modification from the prevalent state of husbandry in different districts. The same principles, according to Mr. Bravender, form the basis of the valuation in England. His essay being, however, on the indications of natural fertility and barrenness, and not on the valuation of land; he has not entered into the question of local circumstances affecting the money value of the produce. He has shown that the productive quality of the soil depends on composition—of which he has endeavoured to point out the physical indications, that afforded by the natural vegetation among others,—and on elevation and aspect; through which we have not deemed it necessary to follow him. To these he has added geological position, which we apprehend is not taken into account by many valuers in England except himself, and on which Mr. Griffith—a geologist of considerable original research—has placed no reliance, except so far as the *mineral* characters of the rocks beneath influence the composition of the soil. He assigns different values to clayey, sandy, loamy, calcareous, and rocky soils; but he does not assign different values to the clays, sands, loams, &c., upon the various parts of the geological series; and Mr. Bravender, who has attempted this, or something very like it, has only succeeded in showing that clays, sands, and rocky soils are barren, and loams fertile, whatever the rock

on which they rest, or from which they are derived.

We will now state our own views as to the improvement of which the art of valuing land is susceptible, and the means by which it may be effected. The first point is the establishment of a classification and nomenclature of soils. In the reports of the Board of Agriculture, the surveyors—who were some of the most experienced land-agents and agriculturists of their day—complain of the difficulty of describing the soils of any extensive district, not only because of the irregularity and intricacy of their distribution, but because of the confusion arising from local names, unintelligible beyond the district in which they are used, and from the loose and inaccurate manner in which the common names of clay, sand, and loam are employed among farmers. They complain that the meaning attached to these terms varies with the district. If the prevailing character of its soils be clay, loam is called sand; while in a sandy district it is called clay, particularly if inclined to be wet.

The best classification of soils is a chemical classification, founded on their composition according to the proportion of sand separable by washing; it divides them into sands, sandy loams, loams, clay loams, and clays. It subdivides these again into fine and coarse sands and sandy loams, according to the size of the particles of sand, and into gravelly sands, loams, and clays, according to the proportion of pebbles or fragments of rocks. The proportion of calcareous matter indicates whether they are to be called marly or calcareous sands, loams, and clays; while if they contain a certain proportion of vegetable matter, they are called vegetable soils. Each name should express some defined proportion of sand separable by washing, and of calcareous or vegetable matter. The defect in the classification of soils given in the instructions to the Irish valuers is want of precision in this respect. In such a classification as we advocate, we should have:—

1. *Siliceous soils*, containing from 90 to 95 per cent. of sand. These would be divided, on the same principle, into blowing sand, coarse sand, good agricultural sand, and calcareous sand.

2. *Loamy soils*; 70 to 90 per cent. of sand separable by washing, subdivided into coarse sandy loam, fine sandy loam, loam, rich loam, and calcareous loam.

3. *Clayey soils*, with 40 to 70 per cent. of sand; divided into clay loam, clay, and calcareous clay.

Each of these soils, termed calcareous sand, calcareous loam, &c., contains 5 per cent of lime.

Marly soils constitute a fourth group, in which the proportion of lime ranges between 5 and 20 per cent., and are divided into sandy marls, loamy marls, and clayey marls.

Calcareous soils contain more than 20 per cent. of lime. They are divided into sandy calcareous, loamy calcareous, and clayey calcareous. While in calcareous sands, clays, and loams, the proportion of lime does not exceed 5 per cent. The difference of composition denoted by difference of name, is similar to the sulph*ates* and sulph*ites* of chemical nomenclature, which contain different proportions of sulphuric acid.

According to the quantity of pebbly fragments yielded by a square yard, or by a cubic foot of the soil, they might be denominated *gravels*, or *gravelly* sands, loams, and clays.

Vegetable soils vary from the common garden mould, which contains from 5 to 10 per cent. of vegetable matter, to the peaty soil, in which the organic matter is about 60 or 70 per cent. They will be vegetable sands, loams, clays, marls, &c.,

Considered geologically, soils may be classed in three groups:—

1. *Local* soils, or those derived exclusively from the debris of the rock on which they rest, unmixed with the materials of other rocks.

2. *Erratic* soils, containing the mixed materials of several, and in many cases distinct formations, transported by currents of water which, at the close of what is called the tertiary period of geology, acted irrespectively of the present lines of drainage and sea levels.

3. *Alluvial* soils, composed of finely divided matter, transported and deposited by rivers and tidal currents, in subordination to the existing levels and lines of drainage.

In this combined chemical and geological classification, then, we would reverse the form of Mr. Bravender's table, and arrange the chemical groups in horizontal lines, beginning with the siliceous, and refer them to one or the other of three vertical columns, headed erratic, local, and alluvial. We should thus have erratic, local, and alluvial sands, sandy loams, or clays; of which the erratic would be found to be by far the most numerous. To these names might be added that of the formation on which they rest. Thus we should have, as in a large portion of Norfolk, Suffolk, and Essex, erratic clays and clay loams on the chalk or London clay; and we should have local calcareous soils in certain parts of the chalk, the oolites, and the carboniferous limestone. In the case of alluvial deposits, the soil has been formed of fine matter derived from so many rocks along the course of the river, that the formation on which it rests makes little or no difference in its composition.

AGRICULTURE OF ASSYRIA.

The researches of Dr. Layard in the East embrace the whole country of the Euphrates and Tigris, inhabited by Noah and his family immediately after the flood, from Ararat eastward, until their dispersion from Babel—a country justly termed "the cradle of the human family." The agriculture of this sacred land, including many ancient kingdoms, has made no progress so far as its *modus operandi* is concerned, since the days of Isaiah, whose writings furnish so many faithful pictures of rural life. Indeed, since the downfall of the Assyrian and Babylonian empires, instead of progress, things have rather been moving in the opposite direction; and it is doubtful whether agriculture was not better understood even in the days of Noah himself than it has been ever since. But be that as it may, it is very remarkable to contemplate the comparatively stationary state of agricultural practice in the East, amid all the political revolutions which have been experienced; for although empires have succeeded empires, scarcely leaving a vestige of their greatness behind, yet no change has taken place in the cultivation of the soil and the management of live stock. The influence of Greece and Rome produced no effect whatever upon the character of the plough and the mode of working it—the produce of the soil and its husbandry—or the breeds of cattle and their management. All these things remain the same to-day, comparatively speaking, as they were when the sculptures of Nineveh were chiselled from the rock. While science has been progressing in Europe, it has been standing still, as it were, in the plains of the Tigris and Euphrates, like the sun "upon Gibeon" and the "moon in the valley of Ajalon," as if the Governor of all things had a great work in hand. Nineveh and Babylon carried captive the Lord's chosen people, as his prophets foretold; and as surely have the predictions of those holy men been literally fulfilled in their own case, for their fertile plains, which once teemed with industrious millions cultivating a grateful soil, are truly now "a desolation," inhabited by a people whose hand is against every man and every man's hand against them. Now we are not about to enter the field of prophecy, but only to glance at oriental agriculture, including the management of flocks and herds, as evidenced by Dr. Layard.

Without regard to descent, the inhabitants may be divided into two classes—those who live in fenced cities and villages, and those who live in tents: the former cultivating the soil and a few of the other arts; the latter almost entirely pastoral in their habits, roaming the country from place to place, in search of grass for their flocks and herds, living wholly in tents. The sculptures of Nineveh represent tents within the walls of fenced cities—whether those of nomads who had sought shelter in troublesome times, times which the sculptured scenes generally represent, would not now be easy to say; but the modern Arabs who live in tents hate agriculture, fenced cities, and villages, as the ancient Egyptians hated shepherds and a pastoral life. Were an Arab chief to send his son or any of his tribe to Bagdad, for instance, on an errand, and if he had not time to return to his father's tent that night, he would make his bed under a tree by the way-side or in the open fields, fearless of all the dangers of the night, rather than come under the curse pronounced against those of his tribe who defile themselves by living within its walls. Citizens and villagers, on the other hand, have no such rooted animosity against living in tents and managing flocks and herds, and hence possess generally more or less of both, especially that portion of them engaged in the cultivation of the soil. There are, however, exceptions from all rules; and necessity not unfrequently, it appears, compels Arab tribes to lay aside their native prejudices, and cultivate small strips of land along the banks of rivers for growing a little millet, of which to make bread, and the villagers to betake themselves to tents.

The oriental plough is a rude implement, sometimes with wheels not unlike some of the old English sort, and sometimes without wheels. The soil about Wan, we are told, is well cultivated with the former; while in other cases no wheels are mentioned, and therefore we presume none exist. In the valley of the Zab, the principal tributary of the Tigris, for instance, "the land," says Dr. Layard, "is so heavy that the rude plough of the country frequently requires as many as eight pairs of oxen." "The Armenian ploughmen sit on the yokes, and while guiding or urging the beasts with a long iron pointed goad, chant a monotonous ditty, to which the animals appear so well accustomed, that when the driver ceases from his dirge they also stop from their labours." In the valley of the Ghaour 6,493 feet above the level of the sea, 10 buffaloes are mentioned as being frequently yoked in rude ploughs of the same sort.

The principal seeds sown are wheat, millet, barley, rice, cotton, tobacco, &c.; of these, millet appears to be the most frequently noticed, forming the staple breadstuff of the poorer Arabs, wheaten bread being always spoken of as a luxury. As in all similar cases, much depends upon climate as well as habits of the people; at the above altitude on the Ghaour, for instance, we are told that it is "too cold for barley;" while at a lower level, in the territory of the Kurds "winding streams irrigate fields of cotton, tobacco, and rice, and turn numerous corn mills."

After the seed is sown, the drought is so great, that without irrigation the fields would be burnt up. Hence works and machinery for this purpose, and their operation in summer form a subject of no ordinary importance among oriental farmers, a description of which we shall give in the words of Dr. Layard himself.

"The mode of raising water generally adopted in the country traversed by the rivers of Mesopotamia is very simple. In the first place, a high bank which is never completely deserted by the river must be chosen; a

broad recess down to the water's edge is then cut in it. Above, on the edge of this recess, are fixed three or four upright poles, according to the number of oxen to be employed, uniting at the top by rollers running in a swivel, and supporting a large framework of boughs and grass, which extends to some distance behind, and is intended as a shelter from the sun during the hot days of summer. Over each roller are passed two ropes, the one being fastened to the mouth and the other to the opposite end of a sack, formed of an entire bullock-skin. These ropes are attached to oxen, who throw their whole weight upon them by descending an inclining plane cut into the ground behind the apparatus. A trough formed of wood and lined with bitumen, or a shallow trench coated with matting, is constructed at the bottom of the poles, and leads to the canal running into the fields. When the sack is drawn up to the roller, the ox turns round at the bottom of the inclined plane. The rope attached to the lower part of the bucket being fastened to the back part of the animal, he raises the bottom of the sack in turning to the bottom of the roller, and the contents are poured into the troughs. As the ox ascends, the bucket is lowered, and when filled by being immersed in the stream, is again raised and emptied as I have described. Although this mode of irrigation is very toilsome, and requires the constant labour of several men and animals, it is generally adopted on the banks of the Tigris and Euphrates. In this way all the gardens of Bagdad and Buzrah are watered, and by such means the Arabs, who condescend to cultivate when from the failure of the crops famine is staring them in the face, raise a little millet to supply their immediate wants."

An example is given close by the ruins of Nimroud, where the friends of the Arab labourers engaged in the excavations encamped or pitched their tents, took possession of strips of land on the banks of the Tigris, and "began to prepare water courses and machines for irrigation." We may here mention that in his travels through the country, continual mention is made of passing the remains of canals, water courses, and ruins of former habitations. For instance: "The embankments of innumerable canals, long deserted by their waters, crossed our path, bearing witness to the skill and industry which once turned these barren plains into one vast garden." A great dam of mason-work across the Tigris is especially mentioned, which is rather thought to be the foundation of a fortification than walls to raise the level of the river for the purpose of irrigation, but it may have served both purposes; for it is scarcely possible that a people so well acquainted with hydraulic engineering as the Assyrians obviously were, should not have adopted some such expedient for conveying the water to great distances across the country, yet so as not to interrupt the navigation of the river. In modern times, with railways, it is difficult to say what effects might be produced towards the restoration of this once fertile country, were such dams made, the embankments of the canals repaired, and the waters of the Euphrates and Tigris once more spread over its parched fields; were ancient Mesopotamia, in short, an English colony, we might profitably enlarge upon the practice, but as it is, it is truly enough speculation.

The operations of harvest are similar to those of the olden times. "The thrashing floor, which added so much to the beauty and interest of the picture at Karagol, had been seen in all the villages we had passed during our day's journey. The abundant harvest had been gathered in, and the corn was now to be thrashed and stored for the winter. The process adopted is simple, and nearly such as it was in patriarchal times. The children either drive horses round and round the heaps, or, standing upon a sledge stuck full of sharp flints on the under part, are drawn by oxen over the scattered sheaves: such were 'the thrashing sledges armed with teeth,' mentioned by Isaiah. In no instance are the animals muzzled: 'thou shalt not muzzle the ox that treadeth out the corn;' but they lounge to pick up a scanty mouthful as they are urged on by the boys and girls to whom the duties of the thrashing floor are chiefly assigned. The grain is winnowed by men and women, who throw the corn and straw together into the air with a wooden shovel, leaving the wind to carry away the chaff, while the seed falls to the ground. The wheat is then raked into heaps, and left in the thrashing floor until the tithe-gatherer has taken his portion. The straw is stored for the winter as provender for cattle." A drawing accompanies this description, and consists of four horses abreast, tied with a rope to a pole in the centre of the floor, and driven at a cantering pace by a boy; another boy is represented as being drawn on a sledge by two oxen, while several men are attending to the straw and corn.

Mills driven by water for grinding corn have already been mentioned among the Kurds; but the wandering Arabs of Mesopotamia use hand-mills, which they carry about with them, consisting of two circular flat stones, about eighteen inches in diameter, the upper one turning loosely upon a pivot, and having a wooden handle for driving it. The grain is put in above, and the flour falls upon a cloth below. They are invariably worked by the women, who, seated on the ground beside the mill, drive with one hand and feed with the other: grinding as the wants of the family demand. All Arab bread consists of unleavened cakes, baked on a gridiron or primitive oven—a hole dug in the ground and plastered with clay, heated with camels dung on brushwood; the latter only being made when the tribe expects to remain stationary for any length of time. On some occasions the women will even make bread riding on their camels: one kneads the dough in a wooden bowl, a second rolls it out on a wooden platter, while the third holds the gridiron—or '*sadj*,' as it is termed, and thus soon hand bread to their husbands; boys attending between the camels in taking the flour, the dough, and cakes from the one to the other, as the several manipulations demand.

The management of live stock is equally primitive with that of corn just noted, as the following interesting example of sheep will shew:—

On his way to Wan, writes Dr. Layard, "three

hours' ride, always rapidly, ascending along the banks of the rivulet, brought us to a large encampment. The flocks had been driven down from the higher pastures, and were gathered together to be milked before the black tents. A party of women already crouched round their sheep. Their long hair was platted in tresses, ending in tassels mingled with gold coins. From a high turban of gay colours, also adorned with coins, a thin white veil fell over their shoulders; and their flowing garments were of bright silk. The children ran to and fro with wooden bowls; and a girl, standing near, sung a plaintive air, beating the measure on a tambourine. The features of the women and the men who came out of their tents as we rode up, as well as the tongue in which they addressed one another, shewed at once that they were not Kurds—they were Jews:" part of the ten tribes, it is thought, wandering shepherds from place to place, like Abraham, Isaac, and Jacob; then at an elevation of about 9,000 feet above the level of the sea.

The practice of the Arabs is similar, women milking the ewes and goats, but men milking the camels. The milk of the latter is drunk fresh, but the former always sour. The Bedouins do not make cheese; the milk of sheep and goats is shaken into butter in skins, or curdled, the curdled milk being eaten. Several varieties of sheep are noticed, including one wild breed, the particulars of which are not given.

An interesting account is given of the horses of the Bedouin Arabs, divided into five breeds. 1st, Obeyan Sherakh; 2nd, Hedha Zayhi; 3rd, Manikia Hedrehji; 4th, Shauaymah sublah, and 5th, Marjoub; all descended, it is affirmed, from the stud of the prophet? The attention paid by Arabs to their horses has been the theme of all travellers, and is also noticed by Dr. Layard; but the breed, he thinks, is degenerating after all, which is much to be regretted, but not more than what might be expected. Horses are only used for the saddle.

Both breeds of camels are still used as they were in the days when Nineveh was in its glory. Frequent mention is made of their usefulness as beasts of burden, the fatigue they endure, and long journeys performed through the desert, where every other animal would sink under the treatment they there survive with apparent ease. In reading these accounts, it has frequently occurred to us that this "ship of the desert" might navigate the interior of our Australian colonies, where it could also be profitably reared. Asses are also used as beasts of burden, and appear to be in their native climate, vast herds of them roaming the country in a wild state, as swift as the antelope, and approaching in size the horse. Mules also exist of great value.

The ox, so much valued in Europe, is less esteemed in the east, among the Arabs. The Bedouins have none, being dependent upon their sheep, goats, and camels for milk and butcher meat. There are, however, large herds of buffaloes, pasturing in the swamps, and common oxen among the Arabs and other tribes, partly used as beasts of draught, and partly for yielding dairy produce and butcher meat. All the breeds are inferior and far below the European in quality. Formerly it was mentioned that we had not been able to discover anything among the sculptures or drawings of the monuments of Nineveh to represent the buffalo, but that we were in doubts as to the humped ox; since then we have seen the second series of "monuments" just published, which we think leaves no doubt that the Assyrians were familiar with the humped ox, for plates 26 and 35 show examples where the back and horn are quite different from those of the other breed shown in plate 22 as the spoil of the city of Lachish, and are evidently intended to represent a different breed—the humped ox, and not the gayal or buffalo. Plate 26 gives a bull and cow, both the hump and quarters of which are of the Indian type.

Such is a hasty glance at the rural economy of the East from the invaluable works of Dr. Layard. Justly may it be said, in conclusion, "The sower is cut off from Babylon, and him that handleth the scythe or sickle in the time of harvest." "Nineveh is become a waste." Nought but famine, with the immediate prospects of starvation, occasioned by some extraordinary interposition of Providence, ever compels the Arab to cultivate the once fertile banks of the Euphrates and Tigris; and even when cases of this kind occur, which are far from rare, how imperfectly is the work performed with an unwilling hand! How temporary its character! How small the return! a stolen morsel as it were, when compared with the crops mentioned in a previous number from Herodotus. Animals also have sadly degenerated, the ass alone in its wild state maintaining its ground. Had not the sculptors of Nineveh been acquainted with better breeds than those which now roam their native land, they could never have produced those monuments of their art which now adorn the walls of the British Museum. Truly Time has laid bare his destroying arm over the cradle of the human family; for when Sennacherib, the king of Assyria, conquered the Hagarenes and Nabathæans, he led captive 208,000 women! 7,200 horses; 11,063 asses; 5,230 camels; 120,000 oxen, and 800,500 sheep. Where shall we now look for these immense flocks and herds? where find the proud victor and his captive female host? We add two pictures illustrative of Arab life, and the spirit which now rules the plains of the Euphrates and Tigris.

"I was riding home from the ruins one evening," adds Dr. Layard, "along with Mr. Longwath. The Arabs returning from their day's work were following a flock of sheep belonging to the people of the village, shouting their war-cry, flourishing their swords and indulging in their extravagant jesticulations. My friend, less acquainted with the excitable temperament of the children of the desert than myself, was somewhat amazed at these violent proceedings, and desired to learn their cause. I asked one of the most active of the party, "O Bey," they exclaimed almost altogether, 'God be praised! we have eaten butter and wheaten bread under your shadow and are content. But an Arab is an Arab. It is not for a man to carry about dirt in baskets, and to use a spade all his life: he should be with his sword and his mare in the desert. We are sad, as we think of the days when we plundered the Anayza; and we must have excitement, or our hearts would burst. Let us then believe that these are the sheep we have taken from the

enemy, and that we are driving them to our tents.' And off they ran, raising their wild cry and flourishing their swords, to the no small alarm of the shepherd, who saw his sheep scampering in all directions, and did not seem inclined to enter into the joke."

"Poetry and flowers are the wine and spirits of the Arab: a couplet is equal to a bottle, and a rose to a dram, without the evil effect of either. Would that in more civilized climes the sources of excitement were equally harmless." B * * * * *.

HOW TO PRESERVE CROPS FROM SLUGS.

One of our correspondents has inquired how to preserve the crops in his garden from slugs, which are so generally complained of this season; and the inquiry has elicited many recommendations of processes, all of which are based upon the principle of destroying the enemy. To build a bridge of gold for him, by pampering his appetite, has been advised by none; and yet is a practice extensively followed by the farmers of some districts. Whether it would be equally successful in the garden, where slugs have such a choice of food, is perhaps doubtful. We are trying it at the present time, and hope shortly to be able to communicate the result. The practice of feeding slugs, in order to save the young wheat from their ravages, has been extensively adopted for more than 40 years by the farmers on the line of the Bath and Staines roads, within reach of the London dung-cart. How much farther to the west the practice extends, we know not. The wheat of that district, sown upon clover ley, is particularly liable to be infested by these devourers, and among farmers whose system partakes of a mixture of market gardening and farming, the practice of setting traps for the slugs was transferred from the garden to the farm. The traps consisted of turnip leaves scattered over the wheat, and looked over every morning by women, who brushed the slugs into a vessel containing lime or salt. It was supposed that the slugs resorted to the leaves for shelter. It happened, however, during one season, that the continuance of rainy weather for nearly a week prevented the clearing of the traps, and in the interval it was found that the slugs had deserted the wheat, in order to devour the turnip tops. The hint was taken, and the expense of collecting the slugs is now avoided by giving them a liberal supply of food, which is more to their taste than even the tender spear of the wheat, and which occupies them till the wheat becomes sufficiently advanced to be safe from their depredations. In our own practice, we invariably strewed abundance of turnip leaves, immediately after the last harrowing, on land on which we had reason to expect the presence of slugs. We have strewn them so thickly that the soil was scarcely visible, and in a fortnight there was not a turnip leaf remaining, the slugs having devoured all but the midribs, on which they were hard at work, while the wheat was untouched; the more the leaves are withered, the more they appear to prefer them. In the garden this season, we found cabbage leaves, strewed along some rows of scarlet runners, which the slugs were devouring, attract them away from the crop we wished to preserve. Fearing they might not relish cabbage leaves so much as turnip tops, we merely used the former as traps and destroyed the slugs. We are now trying the plan of feeding them with cabbage leaves, to save some young peas and broccoli, and other plants of the cabbage tribe, just pricked out, on which our slimy enemies are very busy. It may appear hopeless to attract them from tender young cabbages to the tough leaves of the old plant; but as we have observed that they are greedily devouring and dragging into their holes, even in the vicinity of the young cabbages, the withered leaves and stems of weeds, on which they do not feed when they are in a growing state, there are reasonable hopes that withered cabbage-leaves may suit the slug palate better than the fresh and more tender leaves of the choicest broccoli.

As to ducks, a neighbour who has lost nearly the whole of his successive crops of peas by the slugs, says that he has at last turned his ducks among them with success. Having once called in the aid of these allies, we found them as fatal auxiliaries as the Saxons proved to the Britons. They perversely devoured every young lettuce in the garden, and, in fact, everything but the slugs. Pewits and seagulls are frequently kept in gardens as a slug police, and are not liable to the same objection as the ducks. On the farm, however, the feeding plan is decidedly the most economical. It might be extended with advantage to some of the insect ravagers of our crops, as may be seen in that interesting work "An introduction to entomology," by Kirby and Spence, from which it also appears that the method of decoying slugs from wheat with turnips was practised in Suffolk about the same time as that at which it was adopted in Middlesex. These writers describe, as a very simple and effectual remedy for the wire-worm, a plan communicated to one of them by Sir Joseph Banks. He stuck slices of potato on skewers,

which he buried near the plants expected to be attacked, examining them every day, and destroying the wireworms which had collected upon them in great numbers.

They then add—"This plan of decoying destructive insects from our crops, by offering them more tempting food, is excellent, and deserves to be pursued in other instances. It was very successfully employed in 1813, by J. M. Rodwell, Esq., of Barham Hall, near Ipswich—one of the most skilful and best informed agriculturists in the county of Suffolk—to preserve some of his wheat fields from the ravages of a small grey slug, which threatened to demolish the plant. Having heard that turnips had been used with success to entice slugs from wheat, he caused a sufficient quantity to dress eight acres to be got together, and then the tops being divided, and the bulbs sliced, he directed the pieces to be laid separately, dressing two stetches with them, and omitting two alternately, till the whole field of eight acres was gone over. On the following morning he employed two women to examine and free the tops and slices from slugs, which they did into a measure; and when cleared, they were laid upon those stetches which were omitted the day before. It was observed invariably, that in the stetches dressed with the turnips no slugs were to be found upon the wheat, or crawling upon the land, though they abounded upon the turnips; while upon the undressed stetches they were to be seen in great numbers, both on the wheat and on the land. The quantity of slugs thus collected was near a bushel. Mr. Rodwell is persuaded that by this plan he saved his wheat from material injury."

It will be observed that this process ended where the more economical and equally efficacious practice of the Middlesex farmers commenced as an accidental discovery. Truly, there are few to whom the study of natural history, and observations on the habits of the weeds and vermin around us, would be more beneficial than to the farmer. Who would have thought there was a money value attached to a knowledge of the epicurean tastes of a slug? How a philosopher would have been ridiculed for trying the experiment!

THE CULTURE OF COLSEEED.

Colesced is the common name by which this plant is generally known in this country. That there are two kinds—recognized as Rape, or Rapeseed—and also that their distinctive peculiarities are as readily understood, cannot be doubted. Von Thaër describes them at length—one variety as Colza; the other, Rape. The Colza, or large Colza, is, I have no doubt, precisely the same plant generally cultivated in this country and *known as Coleseed*; Colza, or Coleseed, belonging to the cabbage-tribe; Rape belonging to the radish-tribe—"bearing a great resemblance to plants of that family."

Culture.—The preparation of the land for the reception of this crop differs in no respect from the preparation required for turnips, except that it may be extended to a later period in the season; as coleseed, on good soils, will thrive admirably if the sowing is delayed even so late as the latter end of July. It is indispensably necessary to secure a fine, deep, cleanly tilth, in order to obtain a good crop. The land should then be manured, at the rate of fourteen loads of good dung per acre; and, where practicable, put in upon ridges about twenty-five inches apart. A cheap compost drilled in with the seed would tend much to promote its early growth. If it is impracticable to adopt the ridge-system, drilling on the flat will do well, but requires more care. The manure is so liable to disturbance from drill or harrow, and subsequent hoeing, in either case, on ridge or flat, that the land must be left evenly rolled down: indeed the management required for turnips is just what is requisite for coleseed, and as that is so often pointed out in the columns of the *Mark Lane Express*, it seems to me superfluous here.

Seed.—Cultivators should be careful to procure genuine seed, from seedsmen of acknowledged integrity. If, however, it is known to be produced in this country, no great fear need be entertained as to its true character. It will be coleseed; but then there are some selections superior to others. We hear of "the true branching coleseed," "the gigantic coleseed," &c.; and it is a very common practice, in coleseed-countries, to grow from well-known stocks. The quantity of seed required per acre is small: one-fourth of a peck is sufficient upon ridges, and one-third of a peck upon the flat, drilled at intervals of from twelve to fourteen inches. Great errors are made, in this respect, in many districts; as much as one, two, and even three pecks per acre have been sown. This is decidedly wrong. The plants come up too thickly, so that neither bulk nor quality can be obtained. The great desideratum is to produce a sufficient number of fine broccoli-looking plants, possessing large pithy stalks, and a luxuriant leafage. This is the kind and quality of coleseed upon which sheep delight to graze, and upon which they will probably fatten more rapidly than upon any other description of food; whereas, if the stems stand very thickly, they are small, and being composed of hard, woody fibre, are of no value as food, nor do the sheep care to eat them.

Subsequent Management.—I have said that one great desideratum is to produce this plant of good quality. In order to do this, early-sowing is necessary—not later than the third or fourth week in June. As soon as it attains to the height of four inches, it should be hoed; precisely as the turnip-crop—the ridges by horse-hoeing, the flat by hand-hoeing. The ridged

coleseed should be set or hoed out with a 4½-inch hoe; that on the flat with a 6-inch hoe; taking care to leave good plants single and clear, but weak and feeble ones double, or rather thicker than single ones. This the judgment of the hoer must decide; still bearing in mind that it is large plants, of good quality, he is trying to obtain. The more frequent the hoeings the better the crop. On good soils it will frequently attain to four feet in height.

Depasturing.—The economical consumption of this crop is of great importance. The most common practice is to turn in the sheep be the crop never so good, and let them make their way; this must be wasteful. It is better to provide an adjoining field for the accommodation of the sheep as a "fall-back," and allow them a portion only of the coleseed; upon which portion, however, it will often be requisite to confine them when first put on, to oblige all to feed thereon; as many will prefer searching for blades of grass and other herbage rather than commence vigorously upon the coleseed. But when once they get accustomed to it, no difficulty will ensue, as they will then feed with great avidity. I prefer giving young sheep a daily portion. Fatting sheep require more choice of food; they should not be too closely restricted: rather permit a little waste than retard their progress. Store sheep may be brought forward to eat up such food as the more favoured fatting ones refuse. Many lands of adhesive character are well adapted to the growth of coleseed, but do not permit the crop to be readily or favourably eaten off upon them. Sheep frequently receive injury from such bad lairage as this presents in unfavourable weather; and the land itself, from over-treading, becomes so tough and kneaded as greatly to endanger the succeeding corn-crop. This crop, grown on heavy clay-lands, ought generally to be mown and carted to cattle in the fold-yards, or to sheep on dry lairage. Cattle will thrive surprisingly on coleseed thus supplied to them; and the weight of food produced per acre will exceed most crops of turnips, and the quality of the food be far superior up to a certain period, or rather before any severe frost occurs to injure it. No ordinary frost will do serious hurt; but a continuous frost of several days will do harm—particularly in the absence of snow. I have seen many good crops retain their chief virtues through rather severe winters. The better mode, however, is to consume the coleseed-crop before Christmas, and then proceed or follow with the turnip-crop; and finally, conclude the winter and commence the spring with a good reserve of mangel-wurzel.

In conclusion, I would say that this crop (coleseed) deserves far greater attention and ought to be more generally cultivated than it is at present. All lands will grow it; and most lands of moderate fertility, under good culture, will produce fine crops of it. I have seen many good crops from late-sowing, extending into the month of August; but the earlier the better.

As a Seed-crop.—One word on this point. Land, to produce a seed-crop, should be good, or in a highly fertile state. It is best to sow the seed for this crop about the latter end of July, or early in August. It is customary to feed off nearly the whole of this crop, on some rich soils, and then allow the roots to shoot forth again for a seed-crop. This course, in severe winters, often fails. It is best to sow with an especial view to a seed-crop; it gives more time to clean and prepare the land. I have never seen a crop of coleseed sown and ripen its seeds in one season. It ought to be treated as a biennial. The produce of seed will vary from twenty to thirty bushels per acre. The haulm, however, is not of much value. P. F.

APPLICATION OF STEAM TO AGRICULTURAL PURPOSES.

Sir,—Having much interested myself of late about the application of steam to agricultural purposes, I was glad to see the subject so fully and ably discussed by the Farmers' Club, as reported in your valuable paper (of which I am a constant reader). The relative merits of fixed or portable steam-engines for the use of the farm must, in my opinion, depend entirely upon circumstances. Where the farm is not large, and the buildings are tolerably central, perhaps a fixture might be desirable; but where it is otherwise, or where there are more than one set of buildings, I think portable engines far preferable. My own crops, for the last two years, have been thrashed by steam; and I do not remember that more than two or three days' work (beyond what was put into the barns during the harvest) has been thrashed in the barn, all parties concerned preferring to do it out-doors; and I am sure less damage is done to the corn in showery weather, and more good to damp corn in fine weather. My plan is to place the engine by the stack over night, ready for the morning. The quantity I thrash is precisely the same as a set of men would remove in the straw into the barn, viz., 60 square yards of barley, and a similar quantity of wheat; that is, ten yards long by six yards wide, and the usual height. At the same time I employ as many horses and carts to remove the straw to the yards where it is wanted, and the corn into the barns ready for dressing. This will require, perhaps, one horse more than it would to remove the unthrashed stack. My calculation is that I save by this plan the entire expense of removing the stack, with the exception perhaps of a boy or two to help with the thrashed corn. I was prejudiced against thrashing abroad until custom removed the prejudice, as I have no doubt it will do with all who try it.

If you think these few remarks worthy a space in your next week's paper, your great desire to promote economy in all matters relating to farming I am sure will induce you to insert them.

I am, dear sir, yours truly,

A West Norfolk Farmer.

West Norfolk, June 23, 1853.

HAYMAKING.

The old saying, that "farmers are too dependent upon the ever fluctuating changes of climate, soil, and circumstances, for being guided by theoretical rules," has this year been realized in haymaking in not a few cases. Book-learning has been proved not enough to inform the amateur how to perform the operations of the harvest-field between thunder-showers; an apprenticeship being necessary, under such circumstances, before the art can be practised. For example: Middleton's rules for Middlesex, which have generally been quoted, either verbatim or in substance, as the best for making meadow-hay, are not enough; for they are not adapted for bad hay weather, nor for all our provinces in good, or probably for one year out of ten, even in Middlesex itself. They are rules for the exception—good years, exempt from all difficulties; seasons, in short, when any one can make hay. It is no easy matter laying down rules for haymaking in showery weather; and yet the work must be done.

Haymaking is partly a chemical, and partly a mechanical, process; either of which comprises a series of practical details, at all times influenced by the weather, whether wet or dry; burning suns and scorching winds influencing them on the one hand, as well as thunder-showers and muggy weather on the other. On the former branch of the subject it is not our object at present to enter, but to offer a few general observations on the latter.

Mowing-machines, tedding, or haymaking-machines, horse-rakes and pitching-machines, have given rise to new theories and practices of late. Very little hay, as yet, has been mown by horse-machines in this country, it is true, almost the whole being cut by the scythe; but in the United States of America it is otherwise; as, for many years there, strong efforts have been made to cut by horse-power, although hitherto mowing grass has not been so successful as mowing corn; and one of her farmers is now actively exerting himself to introduce the practice here: with what prospects of success the Gloucester meeting will very soon tell.

The difference between the mowing-machine and scythe is this: that the grass is not gathered into swathes with the former, but falls backwards over the blade or cutting-knife, and is thus nearly as evenly spread over the ground as it grew—a difference attended with very important results in practice, both in wet weather and dry; more so, probably, in the case of artificial grasses than the natural. In our northern provinces, where artificial grasses are generally cultivated, and where meadow hay forms the exception, such a difference may cause an entire revolution in the art of haymaking. Mr. Stephens, an authority of considerable repute, very justly observes to the effect that the worst mode of making hay in the world is that generally followed in Scotland; and although it must thus be admitted that our northern neighbours are occasionally a little obtuse in chemistry, yet they are never far behind in mechanics; and hence, if Hussey succeeds in showing them that artificial grasses can successfully be mown by horse-power, then we may yet hope to see haymaking machines and horse-rakes following in the wake of an "American harvester," to say nothing of pitching-machines, subsequently noticed.

This difference between the mowing-machine and scythe will be much in favour of the tedding-machine, whose greatest shortcoming is in spreading equally the newly-mown swathe. All machinery, where the power and velocity are each uniform, require the resistance, or work to be done, also to be uniform; but such cannot be realized when the grass is gathered into swathes; for in this position it not only presents an irregular resistance, especially when the horse is going across the swathes, but the hay is also of unequal weight, and hence the bottom and heaviest flies the farthest, parcels not unfrequently being thrown from the machine in a non-separated state, adhering together, as it were, by the mere dint of gravity, its weight being too great for the resistance of the atmosphere through which it has to move to separate it. Frequently, instead of flying off at a tangent perpendicular to the ground, so as to allow it to fall when the machine passes under it, it is thrown before the machine, requiring to be lifted a second time; greatly thus increasing the draught and resistance, and leaving the work at the same time less perfectly performed—probably not so well and equally spread on the ground as it is behind the blade of the mowing-machine. In short, the cutting of grass with the scythe takes a vast amount of hard-labour from the mower to gather it into swathes, and no little sweat of his brow afterwards to spread it out again from them; both of which the mowing-machine obviates. Every mower is familiar with the fact that little strength, comparatively speaking, is necessary to cut any crop to what is required to bring it round into the swathe.

The tedding-machine and horse-rake have long now been important auxiliaries to the intelligent farmer in hay-harvest, effecting not only a great saving of labour, but ensuring also better performed work. We say so with great deference to some old people whose prejudices lead them to the opposite conclusion, and who, although occupying large hay farms in localities where labour is expensive, complaining loudly about bad times, grumbling at the cost of farming on the one hand and reduction of the price of produce on the other, have yet neither sought the assistance of the one nor the other; but who make hay as their forefathers did, with forked sticks—implements fitter, indeed, for the days of Boadicea than those of Queen Victoria. We have seen very good hay made, too, with forked sticks, not a hundred miles from the metropolis; but when farmers meet in public assembly to discuss the comparative

merits of fixed and portable steam-engines for agricultural purposes, it is surely high time to think of progress; for wooden forks of Nature's manufacture are slow-going implements in the harvest-field, and those who use them, like themselves, very blunt farmers.

The tedding-machine has two distinct modes of action: the one revolving in the opposite way from that of the wheels on which it is borne, and the other in the same way. The former is used in tedding before the grass is gathered into "wind-rows," and the latter for shaking up, turning, and loosening it after it lies in this state; but these rules are not arbitrary, the opposite being sometimes necessary in practice, as peculiar circumstances demand. Indeed, the only safe rule which can be laid down in practice is, to "drive on, and keep out of the way of the horse-rake." To work the machine successfully, the farmer must attend in the field himself, and give orders always as the state of the grass and weather demands; and in fine sunny weather, with a brisk drying breeze, such a rule may frequently be heard responded to by the whip of the driver. At the same time a certain *modus operandi* is preserved, something as follows:—

As soon as the state of the grass will admit, whether lying in the swathe or already shaken out the first time, the machine is started and kept moving on as fast as possible until the farmer calls it back to give it a second tedding. Where the "windrows" of the previous evening had not been carried, but cocked, they by this time require tedding, and the machine has consequently to go over them. The nearer the grass is made into hay the more liable is it to "burn" or "scorch," as it is technically termed, and hence requires to be more frequently turned; so that the working of the machine demands very close attention immediately before the hay is gathered with the rake into windrows; and also before it is carried for stacking, in order to secure the best quality. In this manner it is alternately moved from one place to another until the work is completed, finishing off one break for the rake, a second for carrying, and taking on another from the first tedded or newly-mown grass. If the weather is fine there is never any occasion for the machine standing idle.

As soon as the hay is fit for "windrowing" the horse-rake commences. A careful hand is required to work it, and if such is employed the rows will be left regularly, of the proper size, in going across the tedded hay, neither being too large nor too small, but so left as easily to be turned with the machine, and the process of drying concluded. The lighter the crop the sooner may the rake commence, and as soon as the rows are made they should be turned with the tedding machine, shaking up the hay from the compressed state in which it is left by the rake into an open, loose body. Besides gathering into windrows, the horse-rake has to bring up the rakings behind the teams and carts, leaving the field clean.

Carrying seldom commences before 11 o'clock A.M., and not unfrequently after an early dinner. The latter hour will leave from 6 to 7 hours, during which time a sufficient quantity of hay can be secured to make good work in the process of heating the stack if hands are active. No small part of the art of hay-making consists in arranging matters so that a regular quantity of hay is put together daily or at one time. If the process of heating does not proceed regularly upwards from the bottom to the top, it is seldom that the result is favourable. But we are not to digress into the chemical part of the subject. In the early part of the day the hands engaged in the carrying assist to throw out the cocks of the previous evening; and besides them a few more are always required to cock the windrows not carried, or unfit for carrying, before night or rain fall, and to put together the hay in the windrows for pitching.

In the moist climate of Ireland it is no easy matter to make hay after the English fashion, either in the field or stack-yard. Indeed we never saw properly heated hay in the sister country, its peculiar climate having given rise to a different practice. There crops are generally heavy, and after being tedded are put into "lap cocks," as they are technically termed, for the first night, which are made by the hand, thus: One person with a rake rakes about three or four feet inwards to the tedded hay; another follows gathering the hay thus raked into small parcels, each rather less than an ordinary sheaf, placing them upon the raked ground, each with the two ends folded under it, on the elasticity of which it is borne, leaving the middle as it were arched, and open for the free circulation of the air under it. If the top is broken, or in a state not fit for carrying off a shower should it fall, a "lap" or small handful is put crossways over it, which finishes the "lap cock," when the hay-maker gathers hay for another, keeping close up to the rake, always advancing forwards. Any number of rakers may follow, and when finished the field has a neat and workmanlike appearance, and will stand a vast amount of rain free from much injury. If the day following is favourable the lap cocks are spread out and tedded, but otherwise they may remain, and frequently do so until the hay is fit for putting into hand cocks of considerable size so built as to resist rain, and in which it remains until it is carried. In such cases the lap cocks only require to be turned over, the bottom uppermost, to dry before being gathered into windrows for hand-cocking. When farmers intend to sell the hay, it is sometimes built in ricks of from one to two cart-loads each upon the field, in which it remains until removed by the purchaser, or is carted to him. But whether built in the field or stack-yard, heating is rather avoided than otherwise.

The foregoing observations have only reference to hay made from natural grasses or "meadow hay," as it is sometimes termed: hay from artificial grasses, such as rye-grass and clover, is rather the exception in England, although the rule in Scotland. One practice, however, prevails throughout both: the grass is allowed to lie in the swathe until fit to be put into cocks; in which it remains until put into ricks of from a load to two loads each; in these it remains over a third period, until fit for stacking. The length of these three periods depends of course upon the weather. Heating is carefully avoided, the object being to keep the hay as green as possible. For this purpose the swathe should

be turned, to prevent it from scorching above and blanching below; a rule, unfortunately, too frequently neglected in practice, the whole being left until it is fit for being got into cocks, when it is windrowed, and the first process finished with all the despatch possible. In the small cocks the extremes of blanching and scorching are modified, restoring the hay to something of an uniform appearance, but yet greatly deteriorated in quality.

The opposite practice of shaking out and tedding rye-grass, and windrowing with the horse-rake, is objected to as breaking the hay, and mixing all sorts of dirt in it. But such is merely an objection in degree, granting it to be otherwise true; for meadow hay is also broken, and mixed with dirt; so that taking into consideration the fact that rye-grass is generally too long in being cut, and never tedded otherwise, the real objection ultimately resolves itself into this—a practice which has proved itself sound in the case of natural grass *versus* a practice which has never been tried in the case of artificial grass, but one which the mowing-machines may necessitate, as already noticed at no distant period.

Hay is generally pitched from the carts or waggons by the horsemen while being carried; when the stack gets beyond their being able to accomplish the work, a second set of hands are placed upon scaffolding. In the United States of America it is done by horse-power, and we see no difficulty in making a portable steam engine pitch the whole crops, in hay and corn harvest. We shall conclude this paper with an observation from the Patent Office Report, Washington, for 1849 and 1850, under "Improved Hay Fork," communicated by M. Larkin, Esq., of East Brandywine, Chester county, Pennsylvania:—

"I cannot conclude without attempting to bring to thy favourable notice a simple contrivance, lately introduced into our State, for pitching hay by horse-power. I put one up before harvest. I think it possesses great merit as a labour-saving implement. It consists of 3 pulleys, about 85 ft. of $\frac{3}{4}$ in. rope, and a large fork. The head of the fork is about 28 in. in length, and $2\frac{1}{2}$ in. square, made of good wood; the handle should be $5\frac{1}{2}$ ft. long, morticed into the head, and secured from splitting by a strap of iron clasped around the head, and extending some distance up the handle; the prongs should be made of good steel 20 in. long, $\frac{3}{8}$ in. thick at the head, and tapering down to a point; they should be set into the head at equal distances apart, and with a burr attached, to screw them up tight; two ropes or iron rods, about 3 ft. long, fastened to the ends of the head, are brought together, to which a pulley is attached; a small rope is also fastened to the end of the handle, in length to suit the height of the beam, by which the fork is kept level as it is raised to the top of the mow, where the hay is discharged by slackening the rope. In adjusting the machine, let one end of the main rope be attached to the peak of the rafter about 3 ft. over the bay, thence let it pass through the pulley on the fork, then through the second pulley, and then through the third pulley fixed to the lower part of the door-post, to give a lever draft for the horse; one person on the load, one or two on the mow, and a boy to lead the horse, constitute the force necessary to unload hay in this manner; and though a simple machine, it will be found to save much hard-labour."

ACTION OF DROUGHT ON PLANTS.

The specific action of drought on plants is one of the problems not yet entirely solved. Whether it is the indirect waste of moisture on the plants by evaporation, or the want of the due proportions of water necessary to build up the structure of plants, or whether it is some indirect action on the constituents of the soil, is by no means a settled question.

The present season has afforded abundant illustrations of the effect of want of moisture on the several plants the farmer has to cultivate; and what is more remarkable, the drought, though absolutely less than it was last year, seems to have had a far greater effect on the plants. The meadows especially appear to have suffered. In all the northern counties particularly, the grass crop is peculiarly affected. The finer and shorter grasses are absolutely either wanting, or so thin that they show the meadows to be without bottom grass. The coarser grasses are tall, but thin, and running to seed, forming no tillering stalks, and few blades in comparison to those of former years. The corn is the same—thin, stunted, and spiry in its character. There has been no tillering—no thick matted surface. The drills have been visible up to the present period, and the stems are fast running to ear before half the usual height is attained, being also hard and yellow in colour, and as different as possible from the graceful flowing blade the wheat plant usually exhibits at this period.

Now, in what specific way has this drought so acted on the plants? In ordinary vegetables 90 per cent. of their whole structure is simply water. Hence it is easy to conceive how large a quantity of that material is necessary during their growth and development. But there was no such absolute deficiency this season. The soil always contained a comparatively large amount of moisture: the dews were often plentiful, amounting to fully as much more as any diurnal development of the plant could require, and all the tables of rain

fallen in the spring of this year, we have seen, showed a larger quantity than in the corresponding months of last year. Hence it seems we must look to the abstract cause of the injury—to somewhat beyond the mere denuding of the plant of water, as such.

We think the theory of Liebig far better established this season. The plant, to take up its elements, must have them presented to it in a state of solution. The action of rain operates to dissolve regularly and gradually the material required by the plant, both in the soil and in the rocks from which the soil is continually forming, by disintegrating the small particles existing in the land. These are being supplied to the plant by the rains as it requires them, but this year they have not been so washed out and made ready for its use. But why did not the same cause operate equally in the spring of 1852? Simply because the incessant rains of the autumn and early winter had washed out the soluble constituents of the soil, so as to leave less free material in the land by far than in the previous spring, and hence the ordinary drought had much greater effect on the plants this year than it had last.

The effect of water on plants, regularly supplied, is most wonderful. Those who have seen the Clipston water meadows, and the small and clear stream, which produce from three to five crops of grass per annum, either depastured or mown, or partly the one and partly the other, must be convinced that it is almost as much owing to the plentiful supply of water in a dry season, as to any great amount of manure held by that small river in solution, that the vast increase of grass is produced. By watering, Mr. Kennedy, of Myremill, keeps close upon a thousand head of stock on 90 acres of Italian rye-grass. In ordinary seasons, from five to nine sheep can be kept on one acre of land; the latter may be done in a dropping season, on clover lays, on well-cultivated land; but with the aid of a little artificial food, and by the application of *liquid* manure, in the shower form, by steam, Mr. Kennedy can keep fifty-six sheep per acre! Nor can we believe that this is altogether due to the manure. To that it is partly owing, doubtless; but it is by far more owing to its being *watered* with that manure in a soluble state, and so fit for the immediate use of the plants. Hence he is independent of season. The water-drill, to which we before alluded, is an application of the same principle; and the wonderful results of the dressing of dissolved bone liquid, in a dry season, by the Duke of Richmond, is a powerful fact in the same direction.

That it is the want of soluble manure, or, in other words, elements of plants, which is mainly the cause of the injury, is manifest from the fact that all the poorest land has suffered by far the most from the drought. The very highly manured land has sustained the least damage; while on land to which very highly soluble manures, Peruvian guano, for instance, and similar materials, have been applied, the crops are growing vigorously.

Nor let it be forgotten that the rain brings down the ammonia, which, in dry states of the atmosphere, will float undisturbed; and this failing, as well as the soluble supply below, would of course aggravate the cause of injury.

But what can now be done, with the meadows ripe, and not one-half or one-third of a crop? We say, free your pastures at once, and put in the whole of the stock, if rain has come, and eat up the meadows thoroughly bare. This will amply relieve the pastures, and afford them the chance of an entire new growth. The meadows, with their small produce, will soon be eaten up; and let a dressing of two or three cwt. of the best guano be then applied to them, and a beautiful new crop, and not very late, will yet be secured. The mowing machine and haymaker will soon get it, even if it should clash with the harvest; but we are clear that on all kinds of land more produce, with the present crop given in, will be obtained by such a course, and the present crop will be very acceptable of itself. The fog, or aftermath, has also every prospect of being better after thus supplying the deficiency of the year.

TUP SHOW AT BABRAHAM.

TWENTY-SEVENTH ANNIVERSARY.

The assumption of any extraordinary success in the pursuits of agriculture can scarcely be tested too severely. The effect of a well-planned puff may be to do incalculable injury, far beyond the limit of its own immediate failure, and stay him who has been persuaded to put his trust in it, from perhaps ever trusting again. Whether it be the invention of an implement, the application of a manure, or the perfection of a breed, the same caution is necessary. We have still to estimate "the real value of a thing" by the practice of the experienced man. Progression here may be comparatively slow; but the

advance thus made is achieved with a character and certainty, that must in the end tell equally to the benefit of the one who introduces, as of him who follows up, the improvement offered for his use.

We have few more extraordinary or remarkable successes in the agricultural world than that associated with the name of Jonas Webb and his Babraham flock. Tested, too, as this has been, we may safely record it as a pre-eminence arrived at by the most legitimate of means, and with the most commendable of objects. "Success of this kind," as was well observed at the meeting on Wednesday, July 6, "is not merely a triumph to the man himself, but it is one rather in which the whole world may share." It is one, too, in which the whole world does share. Another of the speakers declared that he had crossed the Atlantic for the especial purpose of attending this meeting, the fame of which was nearly as well known in America as it is in England.

This is now the twenty-seventh anniversary of the Babraham letting: and we are told by those who have been the most frequently in the habit of attending, that it was in every respect one of the best. The proof here, in some measure, must be taken from the auctioneer's book, which gives a hiring of seventy-one sheep at a gross return of £1,584. In these are included a ram, one of the prize sheep at the Lewes show of last year, which let at the extraordinary sum of one hundred and thirty guineas! It may appear difficult to many of our friends to justify such a bidding as this—one that reads, in fact, something like that approach to "fancy prices," with which the sober business of farming has or should have little or nothing to do. When it further comes out, too, that the gentleman hiring it was the stranger-visitor from the other side of the Atlantic, the less weight may we feel inclined to attach to such a precedent, as the less likely to see it followed up. No one, as it is now almost proverbially known, goes ahead with so much determination as brother Jonathan, when he has once set his heart upon having "an article." It is his pride, and boast, too, to try the length of his purse against the old country; and so, whether it be a race-horse, a short-horn, or South-down, "the figure" he went to becomes a prominent feature in the report of his bargain. Good judgment and good advice may do much for him; but it is what Sam Slick calls "the sperit" that, after all, stamps the value of his Derby winner, his Bates' heifer, or his Jonas Webb's ram.

We should be the last to dispute the real judgment and care evinced by most of our friends from the United States in their purchases of stock. Indeed, as we have already had occasion to state within these few weeks, they are becoming day by day better qualified to make their own selections, and not to trust so much to those "introductions" on which they at first almost altogether depended. Mr. Rotch, in fact, has ample confirmation for the long price to which he extended his offer at the letting on Wednesday. The last bid against him was, we believe, a *bonâ fide* one, from an English agriculturist, deservedly distinguished as a breeder of some of our best kinds of farm-horses and cattle, though not yet so famous for his flock. Still there is no gainsaying but that this extraordinary price, standing *per se*, might naturally be regarded with something like a doubt as to its genuine character; and hence the attention we have called to, and the comment we have offered upon it.

There are few who have not heard, if not all enjoyed, the pleasures and real "treat" the Babraham day affords to the lover of agriculture and of rural life. Perhaps of all the many scenes and "sights" our visitors from the United States may be called on to witness or to take a part in, none will be calculated to make a deeper impression upon them than this; none can certainly give them a better notion of what the individual exertions of an Englishman may accomplish, or of how liberally his fellows can encourage and enjoy his success. The first to originate gatherings of this description, none has ever essayed on them with better taste, or in a more thorough spirit of national hospitality, than Jonas Webb.

The meeting of last week was, as usual, attended by some hundreds of visitors of nearly every class in society. The Earl of Hardwicke again presided, supported—as will be seen in the report—by a number of gentlemen identified with the interests of the county, as well as by very many more who had come long distances for the occasion. The different addresses delivered were generally pertinent, though not, perhaps, altogether so worthy of remark as on some former anniversaries. The only one that at all threatened to interfere with the business of the day was a tedious speech from the clergyman of the parish—a reverend gentleman who evinced a most amiable lack of discretion, both as to the length and tenor of what he felt it necessary to say. For the future, we would really hold out the example of his young squire for his imitation, and advise him to be brief and to the purpose. With one sentence from the little the former so becomingly offered we may ourselves conclude these observations. It guarantees a character in which we entirely concur, and that never could come better to the tenant than when given by the man he holds under. Mr. Adeane, young as he is, appears to only properly estimate his, when he speaks of Jonas Webb as a tenant it must be "to the pleasure and honour of any landlord to have."

The annual letting of Mr. Jonas Webb's celebrated tups took place on July 6th, Mr. King officiating as auctioneer. The attendance was about as large as usual. The animals met with unqualified admiration; and one hired by Mr. Rotch, an American, fetched the astonishing price of 130 guineas, being the highest figure yet obtained by any single tup since Mr. Webb has commenced as breeder. There were 71 sheep let, which netted £1,580, being an average of £22 4s. Previous to the letting every animal has a reserved bid fixed upon it, by Mr. Webb himself, and it is but justice to that gentleman to say that every tup put up realized more than the price put upon it. Indeed, the aggregate produced £500 more than the reserve; one instance we might name, of a ram being fixed at £5 5s. fetching £18.

THE DINNER.

The usual tent was erected for the dinner. Substantials and delicacies were beautifully laid out, the tables being decorated with a profusion of flowers and evergreens, as well as the capacious tent itself, presenting a sight of surpassing excellence. This annual festivity draws together 200 gentlemen; it is graced by the presence of nobility, clergy, yeomanry, landlords, tenant farmers, professional gentlemen, and tradesmen; and, by a judicious arrangement of the worthy and hospitable host, political subjects are carefully eschewed, so that not a remote chance should exist to jeopardise or mar the spirit, good feeling, and conviviality of the day. Many eminent agriculturists who were present at the letting were obliged to content themselves with hiring some of the best tups, circumstances not permitting them to stay to dinner, to which about 200 gentlemen sat down, under the able presidency of the Earl of Hardwicke. Among the guests we observed Sir John Shelly, M.P. for Westminster (who hired some lots, and left before dinner), Sir H. Oxendon, W. P. Hammond, H. J. Adeane, Kekewich, W. J. Copeland, Bradfield, Sherwin, Hammond (Newmarket), Grasset, Rotch, E. Hicks, Thorne, Wheeler, and John Fryer, Esqrs.; Dr. Webster, Major Huddleston, Captain Davis; the Revs. J. Singleton, Mule, Graham, Fendall, W. Syer, and Lamprell; the Messrs. Frosts (2), Nices (2), Chaplins (2), H. Marshall, O. Edwards, Webbs (5), S. Jonas, Seston, Ward, John Claydon, Ed. Pope, Woodruffe, Clover, Slater, Bennett, W. Dunn, and Fairley, steward to Geo. Pryme, Esq., of Wistow, &c.

Justice having been done to the dinner, the President proposed "The Queen," with three times three.—(The National Anthem).

The PRESIDENT next proposed "Prince Albert, the Prince of Wales, and the rest of the Royal Family;" and then "The Bishop and Clergy of the Diocese," coupling with the toast the name of the Rev. Mr. Singleton.

The Rev. Mr. SINGLETON acknowledged the toast in a speech, which want of space compels us to omit.

Mr. ADEANE, in a complimentary speech, proposed "The Lord-Lieutenant of the County," who (he said) was respected and honoured by all who knew him (three times three).

The PRESIDENT said he felt indebted to his excellent young friend for the kind manner in which he had proposed his health as Lord-Lieutenant of the county, and he was equally as gratified at the manner in which they had received it; for which compliment he returned them his best thanks.

Mr. JONAS WEBB rose to propose a toast, which he felt would be acceptable to all. (Hear, hear.) He had lived about thirty years as tenant on that farm, during which time he had been treated with the greatest possible kindness. He proposed, therefore, the health of Mr. Adeane, and likewise expressed his thanks to Mr. Singleton for the kind manner in which he had introduced his name.

Mr. ADEANE acknowledged the compliment, and wished all landlords could boast of such tenants as Mr. Webb (applause).

Mr. HICKS (Wilbraham) congratulated Mr. Webb upon his success that day, and assured him that no one watched the result of his exertions with greater interest than he did: the success of agriculture depended upon such people as him (cheers). He had the honour of proposing "Success to the Royal Agricultural Society," a society formed for the purpose of encouraging a better system of agriculture throughout the country; and if they would but look around them and see the improvements in farming, they would agree with him that some tribute of merit was due to that society. In conclusion, he called upon Mr. Kekewich, who had, when a member of Parliament, so ably supported agriculture, to respond to the toast (cheers).

Mr. KEKEWICH said he rose at the bidding of his friends to return his best thanks on behalf of the Royal Agricultural Society, and could only wish that they had a worthier respondent. He had been all his life connected with agriculture, and derived his income from it; but never having been a competitor amongst them, he was not in a situation to deserve such a reception. The Royal Agricultural Society was conducted on good principles, its usefulness was generally acknowledged, it afforded fair competition to all the owners of stock; and if differences of opinion amongst them occasionally arose, they were carried on without acrimony or unpleasantness. He only recollected one instance of his friend Mr. Webb being an unsuccessful competitor, and that was when his sheep did him the honour of being the guests of his (Mr. K.'s) sheepfold. He has taught us to appreciate a good leg of mutton, which his friends did in good earnest, and he must compliment Mr Webb upon his being an admirable specimen of an English farmer—the glory of England (cheers). This was the first time that he had the honour of being introduced to the noble President, whom he appreciated as an honest Englishman, daring to say what he thinks and feels. He hoped to be enabled to meet them again another year, for now that railroads annihilated all time and space, there was every inducement to pay them another visit (cheers).

Mr. JONAS called upon them to fill a bumper to a toast he was about to propose.—[The noble Chairman: "Half full will do."]—No; a bumper, and nothing less, to drink the health of the noble Chairman, not as an able, bold, and daring seaman, although that might claim their applause and approbation, but as an English country gentleman he wished him to obtain their applause and approval (Hear, hear).

The noble CHAIRMAN said he thought it an extraordinary fact that Mr. Jonas Webb should call upon him to perform the duties of chairman when no one was fitter than himself to preside; he who performed a most important service to the community at large. He (Lord Hardwicke) had always doubted whether these annual lettings could be lucrative; there must be an enormous expense of feeding and great anxiety as to the result, but they must feel deeply indebted to Mr. Webb for the course he so steadily pursued, and if it was remunerative he was sure all present must be much pleased. He thanked them for the flattering manner in which they had drunk his health, but a great many present did not know how he was affected in the present times. No honour could be conferred upon him so great as that of being respected by those amongst whom he lived, whether they were gentlemen, farmers, or labourers; did he receive no other honour he should be perfectly contented (cheers). These annual meetings were of a peculiar character; even this day a gentleman had come over to this country from the United States, on purpose to purchase at the sale, from the most

important country on the face of the earth, connected with them by blood, name, language, and facility of intercourse; this meeting was distinguished by his attendance, and he congratulated them upon finding a brother from the other side of the water present at their board (cheers). As now situated, the ties of America, the success of their commerce, and the encouragement of their familiar association, was of great importance; he sees at this meeting the honest yeomen, and witnesses their nationality in song, never forgetting the great people on the other side of the Atlantic, whose flag is the similitude of our own, that we so much boasted of. We are remiuded still to uphold it; and if called again to emulate, there is no people he should like to be coupled with so much as their brethren of America; to extend their great liberties, carry their flags through "the battle and the breeze," and blend together that important relationship already existing between them (cheers). That gentleman, when he appeared bidding, was always going ahead, prepared to purchase, be the cost what it might. At a meeting of that sort, purely agricultural, they expected no doubt the honour done to him to be a peg upon which he might haug a speech; he addressed them purely on the agricultural interest of England. No doubt any body of men engaged in tilling the soil were one of the most important classes in the community. They had now tided through six or seven years of great anxiety, and had been unsuccessful in upholding a system; they had a right to use any weapons in their warfare, and great allowances ought to be made for the defence they made. The opening prospect before them was not of a cheering character; they would have to exercise all the vigour, talent, firmness, and magnanimity they were capable of: they had weathered the storm, and he hoped they would now meet with a clearer horizon in the times approaching. It was his (Lord Hardwicke's) individual opinion, that they were likely to find in their calculations that which would make them wish that a former state of things existed. They never wished only to meet the case fairly, and compensation ought to have been given them to meet the repeal of duties. Whilst fair and regular prices were given them for their produce they were satisfied; but he had looked on the present times with great apprehension, and had been over many farms, and his opinion was that we should have a short crop of corn at market. The foreign markets warranted them in asking high prices: in the Baltic wheat was 50s. per quarter free on board, and the cost 5s. 8d. per quarter to this country, making the charges, with landing, 7s. The demand on the continent now was so great for corn and shipping, that his agricultural friends would come to a conclusion which it was not necessary for him to mention. He (Lord Hardwicke) should be excessively disposed to demand increased prices (Hear, hear). Under the present system they never knew what prices they had a right to have; they were always in a state of ignorance as to what this country produced, and what was the amount of free importation; and unless they consented to enactments, and insisted upon an annual statistical state of imports, exports, and their own revenue, they would always be in the dark. From the state of the market in the Baltic, and other countries, there was a great dread of famine prices; from the great demands of shipping we shall have to our friends of the Atlantic, the price of labour in America, and the distance to be conveyed, must consequently enhance prices here. His lordship, in conclusion, hoped many friends present would give their opinion of the present appearance of the crops, in short statements and short speeches; and expressed a hope for the greatest prosperity for the agricultural interests (loud cheers).

The PRESIDENT again rose, and said he had arrived at the toast of the evening, "Mr. Webb, and Success to the Babraham Flock" (great cheering); and he could not withhold his expressions of thanks to Mr. Webb for the kindness and hospitality with which he invariably received them (loud cheers). It was a fact, that among the various agricultural meetings that were held in that country, there was not one more worthy of attention and attendance than Mr. Jonas Webb's (loud cheers), in whom the whole interest of the meeting was centred. His Lordship then alluded to the few other meetings of this character—those of the Duke of Bedford and Mr. Mechi most especially—the former priding himself in the production of fine horned animals for the Smithfield Cattle Shows; and the latter calling the agriculturists together to see what could be done with the worst and ugliest land on which to grow the food of the people. This savoured somewhat of the softness of the razor strop (loud laughter). Mr. Mechi spent thousands on this sort of land to show what may be done, and he likewise produced a balance-sheet; he treated his guests with great hospitality, showed them the effects of his great exertions, and he (the President) feared his useless expenditure (loud cheers). They had present among them that day an American (applause). He remembered an anecdote of an American who came to England, and, on his return to his own country, said there were two things that much astonished him here: one was, the Archbishop of Canterbury; the other, Mr. Jonas Webb's tups (laughter). These tups were appreciated by the Americans, and he wished they were equally so on the continent, where a good leg of mutton was a novelty (laughter). He (the President) would now boast of having achieved a great object, for he had gained Mr. Jonas Webb as a tenant (applause). The father of that respected gentleman had been his tenant for many years, but he regretted to say that he was now, from his great age, physically incapacitated from attending to his farm, and he was succeeded by their excellent host (cheers). He (the President) joined them in wishing happiness and prosperity to Mr. Webb (loud cheers, and "three times three").

Mr. WEBB acknowledged the compliment; he felt very grateful to his Lordship for the handsome manner in which he had proposed the toast. He was proud to see such a numerous attendance, and he assured them that nothing should be wanting on his part to produce such animals as they had seen that day (loud cheers). Their kind indulgence and liberality would enable him to keep up his flock, and so long as he met with their support and approval, he should never relax in his exertions (loud cheers). He would, with their permission, propose their annual toast—"The Hirer of the highest price tup of the day" (cheers). If there was one thing more satisfactory than another, it was to witness the spirit of competition evinced by the hirers. If he were not mistaken, the father of that gentleman who was present among them that day, Mr. Rotch, had, nine or ten years ago, bought a ram of him for £50, to take to America (loud cheers).

Mr. ROTCH begged to thank the gentlemen present for the flattering way in which they had received the toast. He little thought in his desire to obtain the ram, that he was also bidding for the honour of making a speech (laughter). It was said that it was necessary to take care of No. 1; and he had also taken care to get No. 112 (the highest lot). He had crossed the Atlantic to be present on this anniversary, an event which was almost as well known on the other side of the Atlantic as it was on this; and he hoped that, although this was his first, it would not be his last visit among them. (Loud cheers). America was trying to improve her stock, and was glad to send to the mother country to enable her to do so. (Loud cheers). He was very grateful to the noble Earl for the

kind allusions he had made to America. They were brothers in habits and in religion—(cheers)—and if any time, through spots on the political horizon, assistance should be required of America for the mother country, that would never be wanting (loud cheers); for on the other side of the Atlantic people looked upon England as the only stronghold of Liberty, and he trusted that between the two countries the most amicable feelings would ever continue to exist. (Loud cheers.)

The PRESIDENT proposed "Prosperity to Agriculture," without which Mr. Webb could not display so admirably such generous hospitality. (Cheers). The prosperity of agriculture was dependent on the zeal, energy, and talent of those who produced the food of the people. (Hear, hear). If they did not work themselves, they must have an eye to those who did the work. (Cheers).

The PRESIDENT gave as his last toast "The health of Mrs. Webb and family."

Mr. WEBB acknowledged the toast, and called upon Mr. Rigden, of Sussex, to give some information as to the growing crops in that district.

Mr. RIGDEN said that at the present time to secure remunerative prices they wanted skill, capital, and attention. With regard to the Sussex Weald he could tell them that one-half of it was unsown, and the other half was not half a crop. Circumstances may arise that would render it impossible to form a conjecture as to the future range of wheat, but he was sure the farmers did not want to see the price too high; all they wanted, and it was nothing but what was reasonable, was, that they should have a remunerating price for their articles of production. (Cheers).

The noble PRESIDENT being about to vacate the chair, there was a loud cry of "A song, a song," on which his lordship returned, and said, "If I understand you aright, before I go you want me to sing you a song. (Yes, yes). Well, you know I have not much of a voice, but I will try." His lordship then sang an excellent song, in good voice and much taste, after which he retired, and his place was ably filled by Mr. Samuel Jonas, who was unanimously voted thereto.

As usual, many of the visitors adjourned to the drawing-room, and partook of tea, at which Mrs. Webb presided, and some preferred to remain and enjoy the generous wine which was so profusely distributed over the tables.

ON THE COMPARATIVE VALUE OF LARGE AND SMALL ROOTS.

BY WILLIAM K. SULLIVAN,

CHEMIST TO THE MUSEUM OF IRISH INDUSTRY; AND ALPHONSE GAGES, ASSISTANT CHEMIST.

In consequence of the practical importance which was attached to some of the results obtained during the investigation into the composition of the sugar beet, carried on in the Museum of Irish Industry, and which were published in the form of a parliamentary report, and especially to that of the relative value of large and small roots, which was so strongly dwelt upon by Mr. Sproule, in his paper read before the Royal Agricultural Society, it was thought advisable to continue the investigation of last year. As the examination was carried on as a part of our official duties, we could not make any use of them, prior to their authorized publication, but for the kindness of the director (Sir Robert Kane), who permitted us to lay a short abstract of the principal results obtained before the society.

A great number of analyses of the usually cultivated roots have been from time to time published; but in consequence of certain necessary conditions not having been attended to, the results have been of little practical importance. Now, one of the first conditions is that of weight, which, as we shall now endeavour to show, exerts a very remarkable influence upon the composition of bulbous roots.

On the Continent, where the roots are grown for the purpose of manufacturing sugar, it was long since remarked, that large-sized roots yielded less sugar than moderate-sized ones, between one and three pounds in weight. Analytically this was fully shown by the researches of the continental chemists, who had examined the subject, and was fully confirmed by our results of last year. Further than this, no practical application seems to have been made of the fact; and as very large roots grown in a rich and properly tilled soil may be better than moderate-sized ones grown in another place, no general law as to growth was surmised. In most previous investigations upon the composition of roots the examination was confined to a single root from each locality; and hence it is owing to this cause that no satisfactory results were obtained.

To remedy this defect, we determined to take six roots from each locality—three of the largest and three of the smallest; and in order to diminish the influence of accidental causes, we subjected a great number of roots to examination. Our results are, in fact, founded upon the examination of about 450 roots of every kind, including Swedish turnips, carrots, the different varieties of the beet, &c.

With a very few exceptions, we have found that, as a general rule, small roots contain a larger per-centage of solid matter than large roots, in some cases even to the extent of fifty per cent. Thus, the mean per-centage of solid matter contained in three roots of sugar beet, varying from 3lb. 11¼oz. to 4lb. 2oz., grown by Mr. Niven, of Drumcondra, was found to be only 10.403, whilst in three small roots, varying from 1 lb. 3½ oz. to 1 lb. 11¾oz., it was 17.427; or, in other words, 100 tons of the small roots would be equal to 167.43 tons of the large. To take another example:—Three roots of long red mangel-wurzel, grown by Mr. Kelly, of Portrane, varying from 6lb. 14½oz. to 9lb. 3oz., contained only 10.986 per cent. of solid, whilst three small roots, varying from 6¼oz. to 7¾oz., contained 15.624 per cent.—that is, 100 tons of the small contained as much solid matter as 142.18 tons of the large. The rule applies equally to Swedish turnips. Thus, three turnips grown by Mr. Boyle, at the workhouse farm of Ballymoney, county of Antrim, varying from 6lbs. 5¼oz. to 6lb. 12oz., yielded 13.731 per cent. of solid matter, and three small roots, varying from 1 lb. 2oz. to 1 lb. 5¼oz., 16.254 per cent.; or, in other words, 100 tons of the small would be equal to 118.37 tons of the large.

Owing to the influence of accidental causes—such as the comparative ripeness of the grains of seed, the influence of manure, &c.—it could not be expected that, in every case, a small difference in weight would be accompanied by a corresponding difference in the amount of solid matter; and accordingly we find that, in many cases, a root of 4lbs. may contain as much and even more solid matter than a root of 3lbs. Nevertheless, such examples are rare, as will be found by reference to

the tables of the detailed report about to be published. But if we divide the roots grown upon a field into several groups, showing large differences of weight, the rule becomes universal. Thus, in seventeen roots of sugar beet, grown by Lord Talbot de Malahide, upon the Island of Lambay, there were—

4 roots of from 6 to 8lbs. in weight, which yielded, as a mean per cent. of solid matter..... 12.541
5 roots, between 3 and 5 lbs..... 14.197
8 ,, under 3lbs. 15.756

These results clearly indicate, that with increase of weight the solidity of roots diminishes.

On tabulating our results we have found that, taken as a whole, small roots, no matter how or where grown, are superior to large roots in the amount of solid matter. The following table contains a summary of our mean results, as far as we have been able as yet to reduce them :—

SIZE OF ROOTS.	White Silesian or Sugar Beet.	Long Red Mangel-wurzel.	Orange Globe Mangel.	Red Globe Mangel.	Swede Turnips.	Red Carrots.	White Belgian Carrots.
Average of roots.							
Above 7lbs.	10.204	10.017	10.785	8.704	10.755	—	—
,, 5lbs.	11.653	11.476	11.028	10.115	11.257	—	—
From 3 to 5lbs.	15.708	14.984	13.974	12.050	12.810	—	—
Average of all roots.	14.532	13.635	12.645	11.188	12.031	13.370	12.990

This table presents some curious results, besides showing the decreasing value of roots as the size increases. Thus, for instance, as far as these results go, the sugar beet contains the largest amount of solid matter of any of the root crops now cultivated; and red and white carrots, though usually sold for £2 or £2 10s. per ton, are very little superior to ordinary swedes, and much inferior to the varieties of beet. Of course we do not pretend that the value of roots can be determined by the per-centage of solid matter alone, as its composition must be taken into account. But, in the same variety of plant, it will give an approximation to the truth—indeed, practically speaking, a very close one; in different species, or different families of plants, it is absolutely necessary to take the composition as well as the quantity of solid matter into consideration. In the case of carrots, however, an examination of the solid matter does not show that they are superior to that of the beet.

In the few exceptions to the general rule which we have observed, the large and small have had nearly the same composition, and no case has occurred where the small roots exhibited a decided inferiority to the large. In general we were able to account for the cause of these exceptions. In one case it arose from the seed being mixed; consequently each root examined belonged to, more or less developed, distinct varities. As a general rule we have found that those roots of a particular variety of the beet which had white flesh were superior to those exhibiting a coloured flesh. In one case, this was remarkably shown, as the largest root which had this character was far superior to the smallest, which was remarkable for the amount of colouring matter which it contained. Another cause of exception was, that the roots which grew out of the soil, and whose upper segment was coloured more or less green, contained less solid matter than those which had grown fully under the soil. This result is in perfect accordance with the fact that the segment of the root immediately below the crown contains less solid matter than the body of the root; and hence if a large part of the root grows out of the soil, the portion thus exposed will partake of the character of that segment.

This last observation would seem to recommend the hoeing up of the soil close to the crown—a practice which, however, appears to be opposed to that of practical farmers. It is singular that not a single exception occurred in the Swedish turnips.

These results lead to the conclusion that nearly all the analyses of roots hitherto made, especially with reference to the action of manures upon gross weight and composition, are valueless. The same remark applies to all experiments made upon the relative feeding qualities of certain crops. We make this sweeping assertion with considerable diffidence, although we feel certain that, on a little consideration, it will be found to be just. Suppose, for instance, that roots grown with one manure are to be compared with the same kind of roots grown with another manure; it is quite clear that if the roots of one set examined be larger than those of the other, the manure with which the small roots were grown will be pronounced to be the better adapted of the two for the growth of that particular root crop. Now, the size of the roots depends, among other circumstances, upon the intervals between the plants; and hence in all such comparisons, the manure applied to land upon which the close-planting system prevails will have the advantage over that applied to land cultivated under the other system. Need we wonder, therefore, that practical agriculture has hitherto derived so little benefit from such an analysis?

It is needless to point out the influence which the facts which we have established must have upon the system of giving prizes for large roots, on the one hand, or of growing them on the other. It is evident that the object of the farmer ought to be, to grow the largest possible amount of food from a given space of ground, quite irrespective of the size of the roots; and if science leads to the conclusion, that that end will be best attained by the cultivation of moderate-sized roots, the present system, which favours the growth of large roots, must be modified. It is for the practical agriculturist to show how this is to be attained; but we are of opinion that a good many useful hints might be gleaned from the practice followed on the continent, with reference to the sugar beet.

EXPERIMENT IN THE FEEDING OF PIGS.

We have received the following account of a very interesting experiment, from Richard H. Bushe, Esq., of Glencairn Castle, on feeding pigs with pulped and cooked swedes, which we now place before our numerous inquirers on the subject :—

SIR,—I enclose you some account of an experiment made here lately upon pig feeding, should you think it worthy of a place in the *Gazette*. I have lately received a number of letters, containing queries as to the mode of using raw food; and, as it would take much trouble to reply to my correspondents individually, I trust they will accept this as an answer to their inquiries.—Yours, &c., RICHARD H. BUSHE, *Glencairn, Lismore, Feb.* 9, 1853.

FEEDING OF PIGS ON RAW *VERSUS* COOKED FOOD.

EXPERIMENT MADE AT GLENCAIRN.

Eight pigs were selected and divided into two lots, as evenly as could be, and put in to fatten, on the 27th November, 1852.

Lots.	No.	How Fed.	Weight on Nov. 27, 1852.	Weight on Jan. 4, 1853, when sold.	Increase of each pig in 39 days.	Quantity of cooked and raw turnips used by each Lot in 39 days.	Quantity of bran and barley-meal used by each Lot.	Quantity of coal used for steaming.
			cwt. qr. lb	cwt. qr. lb	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.
1	1	Fed three times a day, and consumed daily, 2 cwt. 2 qrs. 0 lbs. of steamed Swede turnips, mixed with 12 lbs. of bran and barley-meal.	1 3 0	1 3 21	0 0 21	..	..	..
	2		1 3 17	2 0 14	0 0 25	..	..	..
	3		1 3 25	2 1 0	0 1 13	..	..	..
	4		1 2 18	1 3 16	0 0 26	..	..	..
			7 1 4	8 0 23	0 3 19	97 2 0	4 0 20	20 0 0
2	1	Fed three times a day, and consumed daily 1 cwt. 1 qr. 0 lbs. of pulped Swede turnips, fermented, mixed with 12 lbs. of bran and meal.	1 3 4	2 0 4	0 1 6	..	..	..
	2		1 3 16	2 0 16	0 1 6	..	..	..
	3		1 3 0	2 0 2	0 1 2	..	..	..
	4		1 2 16	1 3 12	0 0 24	..	..	..
			7 0 8	8 0 6	0 3 26	43 3 0	4 0 20	..

Saving on Lot 2 *in comparison with Lot* 1.

	cwt.	qr.	lb.
Turnips	48	3	0
Coal	20	0	0
Difference of increase of weight of pigs	0	0	7

Besides the difference of labour, a quarter of an hour, three times a week, being sufficient for a boy and girl to grate and mix the raw food. Both lots were sold together on the 4th of January for the sum of £25 10s.

The turnips for Lot 2 were pulped, and mixed with bran and meal three times a week, and put into tubs. In three or four days, the food having become warm by fermentation, was used.

Each tub has an orifice near the bottom, to allow the liquor to escape into troughs, which otherwise was found to check the fermentation. The liquor received by the troughs was given to young pigs.

The quantity of coal consumed in steaming for Lot 1 may be thought excessive: however, such was the quantity actually used, although, doubtless, twice the quantity of food might have been steamed with less than twice the quantity of fuel.—PATRICK LAHY, *Steward to Major Bushe.—Irish Farmers' Gazette.*

ON THE COMPOSITION OF CHICORY ROOT.

BY PROFESSOR ANDERSON, M.D.

I have lately had an opportunity of examining chemically the root of chicory grown in this country, and as I am not aware of any previous analysis, those which follow may be considered as of some interest.

The first specimen examined was a dried one, which had been grown in Yorkshire, and was in the state in which it is sold. It was analyzed by Mr. W. M'Donald. It contained—

Water	18.01
Ash on moist substance	2.93
Ash on dry substance	3.64
Nitrogen on ditto.....	1.60

The ash had the following composition; the first column giving the actual numbers obtained, the second the calculation of the composition after subtraction of sand, charcoal, and carbonic acid:—

	1.	2.
Silica.....	3.790	4.423
Peroxide of iron	0.657	0.766
Lime.....	8.644	10.088
Magnesia	5.777	6.734
Sulphuric acid	13.048	15.238
Phosphoric acid	13.882	16.205
Potash	29.687	34.648
Soda	7.641	8.917
Chloride of sodium	2.555	2.981
Sand.....	3.251	
Charcoal	2.567	
Carbonic acid	7.927	
	99.426	100.000

The other analysis was made on a specimen of the fresh root grown at Garscube, in the neighbourhood of Glasgow. It gave these results—

Water	80.58
Ash on moist substance	1.31
Ash on dry substance	6.77
Nitrogen on moist substance	0.28
Nitrogen on dry substance	1.48

The ash had the following composition; the second column giving the results calculated without sand, charcoal, and carbonic acid:—

	1.	2.
Silica.....	0.99	1.29
Peroxide of iron	0.81	1.05
Lime.....	6.09	7.90
Magnesia	3.15	4.09
Sulphuric acid	4.80	6.23
Phosphoric acid	10.02	13.00
Potash	42.60	55.27
Chloride of potassium	1.78	2.31
Chloride of sodium	6.83	8.86
Sand.....	1.12	
Charcoal	9.90	
Carbonic acid	11.40	
	99.49	100.00

These analyses are interesting, in so far as they show the great differences which may exist in the composition of the same plant from two different localities. We can, of course, only compare the dry substances, the first specimen having been artificially dried for commercial purposes, although still very damp. We then observe, that, as regards the nitrogenous constituents, they may be said to be absolutely identical, the difference found in the two being quite within the limits of experimental error. But when we look to the quantity of ash, we find that the second sample contains almost exactly twice as much as the first. The various constituents of the ash also show remarkable differences, for the first contains 34.6 per cent. of potash, the other above 20 per cent.

more. The first contains a much larger quantity of sulphuric acid and less chlorine than the second, while the quantity of phosphoric acid is nearly the same in both. Unfortunately, I possess no information regarding the soil on which these specimens were grown, and cannot, therefore, state whether anything is to be attributed to it; but I scarcely think that, even with the analysis of the soil, much light could have been thrown upon it.

The season at which these analyses were made did not admit of any analysis of the leaves of chicory being made, but I purpose to examine them at the proper time, as I learn that they are greedily consumed by cattle.

I owe the specimens now analyzed to Mr. Fulton, who has paid much attention to the cultivation of chicory, and has made some curious experiments on the production of a sort of beer from it by fermentation, in which the natural bitter of the root supplies the place of the hops. He informs me that it has proved a profitable crop, and he is of opinion that it might be extended with advantage. I refrain, however, from entering upon this matter, which lies more strictly within the domain of practical agriculture; but merely mention it for the purpose of directing attention to the crop.—*Transactions of the Highland Society.*

PROGRESS IN THE COMMERCE OF BUTCHER-MEAT, AND MANUFACTURE OF THE OFFAL INTO MANURE.

(Continued from page 52.)

Such a reformation in the commerce of butcher-meat as that contemplated is obviously a work of time. It cannot, for instance, be supposed, consistently with practice, that our present system, exhibiting a general uniformity of character throughout the kingdom, could profitably be laid aside in one day, however antiquated it may be, and the carcass trade, on the most improved plan, turning both the butcher-meat and offal to the best advantage, established in its place to-morrow. Such, in practice, is neither more nor less than impossible; hence the conclusion. But although such is undeniably true, yet that is no reason why such a work should not be begun and concluded with as little delay as possible, for this is sound both in practice and theory. In short, it is an ultimatum at which we must arrive in due course of time, in spite of all the fears, forebodings, and even opposition which may be thrown in our way. In point of fact, it is a work already commenced—one in progress; which therefore renders it the duty, as well as the interest, of every farmer, salesman, and butcher to consider how he can best comply with the changes it demands, so as to profit by the benefits it confers, without sustaining any of the losses it must of necessity inflict; for according to the nature of things, all changes of the kind must necessarily involve losses to some one or other.

In order to illustrate our subject, let us take the metropolis as an example, where one of those changes in question is about to take place, of which there are various others in the kingdom, either being made, about to be made, or contemplated, to which our remarks will consequently be applicable. There is scarcely a session of Parliament in which we have not some half-dozen "Market-improvement Bills" on the list illustrative of the question at issue, and its importance. Now much as has been said of the impropriety of removing Smithfield, the losses which it would inflict upon "*the trade*," the privileged rights it would interfere with, the jobbing and speculation to which it would give rise, and even the impossibility of its removal from such an array of arguments against it, Smithfield, after all, is about to be removed. Now, we repeat, should no other change take place, this of itself is progress towards some ultimatum, whatever it may be. Should Smithfield, we say, be only removed to Copenhagen Fields, and there established on its present system, without a single alteration, save the change of site, it is a work of reformation begun (we are addressing ourselves to those who oppose themselves to all changes of the kind as innovations, those who can accept of no change save from Parliament); and unless the present system is perfect—which it is far from, as has already been shown—subsequent changes must follow at no great distance. Alterations, however, are proposed in the outset, thus publicly admitting that the present system is subject to improvement. The area of the market, for instance, is to be increased from between 6 and 7 acres to 15, besides which there are to be 30 acres under lairage, 4 acres under public slaughter-houses, 5 acres under private slaughter-houses, 1 acre 3 roods under a hide and skin market, 2 acres 1 rood under shops, taverns, &c., 1 acre 1 rood under stables, 3 acres under building frontage, and 9 acres under roads, making a total of 75 acres and upwards, calculated to accommodate 6,794 bullocks, 42,320 sheep in pens, 1,200 calves, and 600 pigs. Hence the question very naturally arises, are those alterations sufficient? Are 24 inches, for instance, the space proposed for one bullock in the new market, instead of 22½, as the rule in the old, all the alterations wanted? In short, is this *one inch and a-half* of difference all the distance which Smithfield has fallen behind, in the march of commercial progress?

If we take up the Blue Books on Smithfield cattle market, and examine the voluminous mass of evidence given before the committees of both Houses of Parliament, it will be found that the burden of the whole answers in the affirmative, although the opposite is unquestionably true. It will there be found proven, that had the area of Smithfield been 15 acres, the proposed area of the new market at Copenhagen Fields, instead of 6½, change would have been unnecessary; and that it was this difference or deficiency of space which was the

cause of its removal, although science leaves the question beyond dispute that not only are 24 inches too little standing room for a fat bullock, and the space allotted for sheep equally if not more defective, but that the whole system is out of date, and, in point of fact, being fast superseded by the carcass trade; so that Science and Practice are not only divided, but the latter is divided against herself, as it were: one party arguing, "The practice of our forefathers is perfect, and we are determined to adhere to it as closely as Parliament will allow us. You theoretical folks have no experience of Smithfield trade; and as theory without practice ought not to be listened to, it consequently follows that your speculations about reform in the trade should be tossed to the winds." "Ditto, ditto," answer the other party, with scarce a dissentient voice; and well they may, for the worse and more antiquated the practice of the former is, so much the better for the latter. While Science very plainly tells both, in answer to the accusation of a want of experience levelled against her, "That their experience is confined to the narrow limits of Smithfield; that they know nothing of the value of her propositions experimentally, and therefore that their opposition to them ought to be set aside as the fears and prejudices of antiquated times." In short, out of their own mouths she briefly condemns her opponents, inviting farmers, as a third party interested, to lend a willing ear to her deductions.

So long as the removal of Smithfield was pending before parliament, the improvement of the market was a subject too little discussed by farmers. The "no politics" *animus* of the day was too strong to admit of that—they would rather do anything in short but discuss a subject, though involving their own interest to the extent of £8,000,000 annually, while pending before parliament! "Leave that to their representatives in parliament, with the corporation of London, and the cattle and carcase salesmen, jobbers, and butchers of the metropolis. Take what salesmen, jobbers and butchers are willing to give, or you may do worse: if too small, grumble loudly that you may do as you have done; but depend upon it, you cannot with any consistency interfere so long as the subject is a political question." Such is wonderfully brief indeed, but conceding to parliament and the corporation of London all the wisdom ever assigned to them on practical matters in connexion with agriculture, and that farmers should not discuss "farmers' politics"—and this is conceding more than will be asked—farmers are now no longer under any political restraint, while the wisdom of parliament and the corporation of London will very shortly be brought to the bar of their experience, so to speak. The opinions of "the trade" will soon cease to be theory, for the metropolitan cattle market is about to be experimentally brought to judgment, and, we fear, condemned, if bullocks are only to receive one and a-half inch more standing-room each in the new market than in the old; for it takes no great stretch of conception to perceive that if this is all the difference in theory, it just amounts to nothing in practice; for bullocks are still to be wedged up and tied to a rail in the same cruel manner as formerly, and sheep crammed into pens, enduring an equal degree of sweating and suffocation; goads will be as much in request as ever, while drovers will yell as loud, dogs bark as fierce, pigs squeak, calves and bullocks bellow, and sheep bleat. In short, a market day from first to last will present the same "pandemonium appearance" as it now does—a scene truly humbling to the intelligent mind, acquainted with the science and practice of managing fat stock, to behold; one which it is the duty of every farmer practically to investigate, as already suggested, who consigns stock to it; not less for the sake of humanity and suppressing cruelty to animals, than the progress of science and his own pecuniary interest.

But while we condemn the present system *in toto*, let us not overlook the many practical difficulties which stand in the way of further progress, for this would be doing an injustice to the London cattle trade—a course which will lead us into the minor details of practice, at least, so far as objections are concerned, and hence compel us for the present to postpone further discussion on the carcase trade and offal, although these have been admitted our grand ultimatum. Before we get that length, we must improve our live-stock markets. Although we were certain of having steam ploughs in the field to-morrow, it would still be necessary to improve our horse-ploughs to-day; for not only would many farmers feel disposed to wear out their old ploughs before adopting steam, but the improved old will have a strong battle with the imperfect or non-improved new before they relinquish the field, for the more the former are improved, the less will be the advantages of the latter. Just so is it with Smithfield: the more we improve its machinery, the less will be the advantages of Newgate; and before the former finally gives up the palm, a desperate struggle will be maintained. Progress in science combined with capital may do much, as has already been stated, to prolong the conflict, as will subsequently be shown, provided the interests of the farmer and consumer are consulted.

Objections to the present practices of Smithfield *in toto* necessarily involve its whole practical details—a much broader field than our limits will allow us to enter upon; so that we must therefore confine our observations to a few of the more prominent of them, taking the wedging system first.

That the wedge is one of the most important of the mechanical powers, need hardly be said; but that it is necessary to uphold the commercial fabric of the cattle market of the metropolis, is a different question surely in practice. Yet such is really the case, that if the wedge of Smithfield is removed, the whole fabric will fall to pieces! So cattle salesmen have concluded, and the blue books already referred to furnish ample demonstration of the soundness of their proposition. Cattle must stand upon their own feet while in the market, and this can only be obtained by wedging them up to the rail as closely as possible. Friday's market proves the perfections of Monday's practice; so there is an end to argument on the subject: objections are harmless.

Those of our readers not practically acquainted with

Smithfield, will doubtless require a little more detail properly to comprehend the above; for the conclusion of the salesman, that fat bullocks will not stand upon a sloping stone pavement for ten hours without being wedged up so closely together that they cannot lie down is matter of fact which need not be wondered at; so that objections to wedging, under this view of the case, really do fall to the ground.

But our objections are not levelled merely against the wedge, but the system which requires it also. Why make the poor ox stand upon a stone pavement at all? This of itself is cruelty unheard of, in the management of fat stock among farmers, even for one hour, let alone ten; and the further we progress in high box-feeding and early maturity, with its consequent tender feet and heavier weights upon them, the more unpardonable will this barbarous practice be; for the pain which heavy animals endure on such occasions very much deteriorates the quality of their flesh, reducing it often to the extent of one penny per pound, and sometimes rendering it almost unsaleable, unless for sausages or salting. During the heat of summer, tons of it go to the knackers' cauldron for tallow and cat's-meat! Deterioration of quality, however, is not all the loss sustained, for quantity also is reduced. There is nothing which reduces the weight of cattle faster than excitement. An ox, for instance, has been known to waste, when labouring under fever, to the extent of nearly 100lbs. in one day; now the fat ox in question is suffering from a similar reducing cause, and the duller and more insensible to pain it appears in the market or lair, the more active may be the consuming flame within. Consequently, what is the loss in weight? and who sustains it? The loss is obviously immense, and the farmer as palpably sustains it.

We can hardly pass over this topic of waste, without noticing the want of information on the subject, as exemplified in the blue-books of Smithfield, for the bulk of the evidence there goes to show, contrary to fact, that no loss, comparatively speaking, is sustained in Smithfield. A farmer, if he perceives his ox hanging his head and ears, feels its pulse, puts it on the weighing machine to see if it is losing or gaining weight: he is not satisfied with his eye and hand; however good judges these may be, an ounce weight must tell its own practical tale. Theory alone don't suit him, practice must be conjoined with it. After his ox has recovered from indisposition, it is again weighed, the difference indicating the loss of weight sustained. Again, when he sends his ox to the exhibitions of the Royal Agricultural Society and Smithfield Club, or any other show, the same practical means are used for arriving at the same practical conclusions—*the loss of weight*. But in Smithfield it is all theory together, and no practice, so to speak—a mere world of opinion, "buying a pig in a sack," rounds of beef and legs of mutton, as did our forefathers, ignorant of science; practical means are repudiated by us, hence the erroneous conclusions at which we arrive relative to the loss sustained. Were the fat ox or sheep weighed when it entered the metropolis, and again weighed when sent to the slaughter-house, and the account sent to the columns of the agricultural press, parties would be advancing science, improving practice, conferring a lasting honour and benefit upon their own name and profession, besides doing justice to the farmer.

But while we condemn the wedging system as incompatible with the present state of science, let us not overlook its merits, if it have any. If we are candid, let us also be impartial. The wedging system, with all its faults, is the best of its kind yet exemplified in Britain! It is the utmost step we have made in the art of tying up fat-stock for sale in public markets! The trade is fully entitled to all the merits it possesses in this respect. It is better, for instance, than the loose drove system of Newcastle-upon-Tyne, and many other markets which we have examined, in the practical investigation of the subject. The ox must be tied up before butchers can handle it properly. Islington Cattle market took a step in the wrong direction in this respect. Butchers can examine beasts better in Smithfield than loose in Islington. The evidence in the blue-books is correct here, although the contrary has repeatedly been said, even in Newcastle-upon-Tyne, where the meat upon the rump and along the back is of less value, comparatively speaking, to the light flank and inferior parts along the belly, than in the capital; both the salesmen and butchers complained that they could not handle beasts so well as in Smithfield, and one had only to go up and handle bullocks in both cases to appreciate the soundness of the trade's conclusions in both places. Again, it is infinitely better than the old ringdrove system of Smithfield itself, of which a remnant is yet occasionally seen. At one time, cattle were sold in Smithfield, as at country fairs, in loose droves only. The ringdrove was an improvement upon this, because butchers could handle better; few bullocks will stand and allow the hardy grasp and often hurried handle of the butcher to pass over their short ribs without being confined somehow. They are as fidgety in this respect as their masters. Tying up to the rail was the next step—a great improvement, but it is unfortunately the furthest progress we have yet made.

(To be continued.)

A SUGGESTION TO ENCOURAGE IMPROVEMENT IN BREEDING HORSES.

Sir,—One of the principal impediments to the improvement of horses bred by farmers exists in the number of badly-shaped, defective, unsound stallions which are permitted to travel through the country and infuse their poisonous infirmities in the offspring of every mare they are suffered to approach. This bad system is encouraged by the low fee for which the services of these brutes are obtained; for too many farmers—led by a mistaken notion of economy—will put their mares to worthless stallions, to the exclusion of sound and useful ones, in consequence of the price. In France, no stallion is allowed to serve mares, beside those of his owner, unless he has been examined, properly passed, and sanctioned by the government inspector. This is an excellent precaution against breeding rubbish; but, unfortunately, there is no law in England of a similar kind. Nevertheless, I fancy much benefit would ensue if the agricultural societies

were to take the subject into consideration, and give more direct inducements to persons to breed from superior stallions. Premiums are given to the owners of best stallions serving in respective districts, which is undoubtedly an encouragement to persons to provide those horses; but that offers no direct encouragement to breeders to send their mares to them. What I propose, is for premiums to be awarded to the breeders of young horses got by certain stallions which had been examined, passed, and approved by the judges of the respective agricultural societies. To make myself clearly understood—supposing any agricultural society were to devote £50 annually to the purpose, and that next season there were five stallions in their district worthy of patronage, five premiums of £10 each should be awarded to five of the most promising and valuable of their progeny when exhibited at the age of one, two, or three years, as might be deemed most expedient. In that case farmers would be benefited by gaining the premiums, and the owners of superior stallions by the increased number of mares that would be sent to them. Yours, &c.,

CECIL.

THE PRICE OF MEAT AND THE SUPPLY OF GUANO.

SIR,—I did not observe when they first appeared the remarks of your correspondent, "A Merchant," on the other guanos besides Peruvian available to the agriculturist. The Bolivian guano to which he refers is extensively used, but the Peruvian is preferred, from its superiority and uniformity of quality. It is a mistake to say that the farmers are slow to try new sorts. Genuine guanos sell readily at prices corresponding to their relative qualities. In 1845, after the discovery of Ichaboe, an enormous sale of the guano from that island was made, its moderate price and excellent quality at once commanding a preference over the high-priced Peruvian. Ichaboe is exhausted, and none equal to it in cheapness and quality has since been offered to the public.

But nothing would so much aid negotiation with the Peruvian Government for opening the guano trade as the search for and discovery of other deposits. Ichaboe was made available to us by a Glasgow merchant, who reaped little from an enterprise by which the country was so largely benefitted. A new guano island is reported to have been lately found by a merchant ship, from which it is to be hoped we shall have good supplies. And there is every reason to believe that if a search were made we should soon have at our command supplies, hitherto undiscovered, which would render us comparatively independent of Peru. The superiority of the guano from Peru is, as is well known, caused by the dryness of the climate. The deposits of guano there are not confined to the Chincha and Lobos Islands (which are distant from each other nearly 600 miles), but are known to exist in almost incredible quantity on the small islands near the coast, and on the rocks on the mainland. Opposite an immense coast line, 2,000 miles in extent, swarming with sea birds, and in a climate where this deposit is preserved uninjured by the weather for ages, there can be little doubt of the existence of many guano islands beyond the jurisdiction of Peru. But the track of vessels, as was lately explained to me by the eminent geographer, Mr. Keith Johnston, of Edinburgh, is very much kept within the limit of the strong ocean current running along the whole coast of Peru from south to north, out of which no vessel is likely to retard her voyage and turn aside in search of guano, unless specially sent on that service. This fact shows how slight the chance is of an accidental discovery; and when we consider that, though the existence of this manure, and its application in Peru to the growth of crops, have been known for more than 300 years, yet that only 10 years ago it was untried in the agriculture of this country, it cannot be matter of much surprise that hitherto neither public nor private enterprise has been directed towards this object. It is understood that our naval authorities on that coast have lately had their attention specially drawn to it, and we may perhaps, ere long, be gratified by the news of a valuable discovery of guano as the consequence of this. The expedition which has just left the United States on a scientific exploring voyage in the Pacific may find what we want if our own ships should miss it; and, as a cheap and ample supply of this manure would have the effect of increasing the quantity, and moderating the price of butcher's meat to the 20,000,000 of consumers here, the matter will surely press itself on the attention of our own Government. Their hands would be strengthened in a negotiation with Peru to have the trade thrown open, if they showed that they were in earnest about it. At the present rate of production and consumption, the price of meat seems likely to rise still further. An increased supply is the only remedy. In my last letter I showed how easily the supply might be increased one-half. If genuine Peruvian guano could be had in abundance at a moderate price, no good farmer in the kingdom would have, but by accident, an acre of inferior turnips, clover, or grass; for it is worth remark that, while very beneficial to corn crops of all kinds in favourable seasons, guano is more safely applied to root and forage crops, which, being consumed in a green state, can hardly be over-luxuriant. Even with the present monopoly, farmers of enterprise are lavish in their use of this manure; and when a man once accustoms himself to good crops and a numerous and well-fed stock, he cannot bear to look at anything of inferior quality on his farm.

An adequate increase in the supply of meat would prevent a further rise of price, which, if only 2d. per pound, would to every individual who consumes half-a-pound a-day be a saving of 30s. a-year—a vast sum when applied to the population of this country. Yet no attention is paid to this, while weeks are spent by parliament in discussing matters of comparatively trivial importance. And this strange anomaly is presented—that, should the feelings of some wandering Englishman in any remote quarter of Europe be offended, a steam frigate or two are straightway despatched to demand satisfaction; while the whole population of these islands may be stinted of food, and a single ship cannot be spared to go in search of the means whereby the supply might be increased. It seems to me the most natural enterprise in the world for a populous country like this to despatch one or two ships of our numerous steam navy on such a mission. A discovery voyage of this nature could not, under any circumstances, be less fruitful than an Arctic voyage, and it would be more likely to be attended with success than the chance visits of commanders, who, having other duties to perform, have not their credit and responsibility at stake. And, even if it failed, we should then be no more at the mercy of Peru than we are at present; for, with the certainty of no further discovery of superior guano, commercial enterprise would be turned to the vast beds of nitrate of soda, described by Mr. Pusey in the *Journal of the Royal Agricultural Society*, as well as to the inferior qualities of guano from other parts of the world, both of which would then necessarily command more attention; and, from trustworthy information which I have lately received, there is good reason to believe that beds of nitrate of soda, more accessible from this country than those of Bolivia and Peru, are to be found in a similar rainless district of Mexico. JAMES CAIRD.

—The Times.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A WEEKLY COUNCIL was held at the Society's House in Hanover Square, on Wednesday, the 29th of June: present, Lord Ashburton, President, in the chair; Lord Camoys, Lord Kinnaird, Lord Walsingham, Right Hon. James Grattan, Sir Matthew White Ridley, Bart., Sir John V. B. Johnstone, Bart., M.P., Sir John Croft, Bart., Mr. Alcock, M.P., Mr. H. Austin, Mr. Buller (Dilhorne), Dr. Calvert, Mr. Cavendish, Mr. Chadwick, Mr. Commerell, Mr. Dyer, Mr. Farquharson (Langton), Mr. Brandreth Gibbs, Mr. Baskerville Glegg, Mr. Fisher Hobbs, Rev. C. T. James, Mr. Cuthbert Johnson, Mr. Livesey (High Sheriff of Lincoln), Mr. Manning, Mr. Mechi (Tiptree), Mr. Orlebar, Mr. Paine, Mr. Parkins, Mr. Phelips, Mr. Puller, Mr. Severn, Mr. Aug. Smith, Mr. R. Trench, Mr. Trimmer, Mr. J. E. Thomas, and Prof. Way. The following visitors were also present: The Hon. Stephen Salisbury and Prof. Nash, from the United States of America; Mr. Wilson, Farm-Bailiff at Windsor to H.R.H. Prince Albert; and Mr. Rammell and Mr. Ranger, from the General Board of Health.

The names of 58 candidates were announced for election into the Society at the next meeting of the Council.

TURNIP HOEING.—Mr. Hudson of Castleacre called the attention of the Council, in the following passage, to a revolving horse-hoe for Turnips, made by Mr. Martin, of Barmer, near Fakenham, in Norfolk:—

> "This newly-invented implement is intended to set out the Turnips in the drills. I saw it in operation a few days since; it does the work exceedingly well, and will prove a great saving of labour. I have myself ordered two of these implements, and expect that they will save the cost-price the first year, as I shall have 200 acres of Swedes all ready to set out in one day, and without these machines it would be impossible to get them done in time."

The advantages which Mr. Martin claims for his new hoe are the following:—1. To cut or hoe out, fit for being singled, Turnips, &c., as now done by hand-hoeing on either flat or ridge; 2, to do two or more drills at one time at any width; 3, to leave the plants at any distance apart; 4, to cut the land to any depth required, and with one man, one horse, and a boy, to do from 10 to 12 acres a day upon the 27-inch work.

The Council ordered their best thanks to Mr. Hudson, for the statement he had transmitted to them, and for the drawing by which it was accompanied.

SEWERAGE MATTER.—Professor Way, the consulting chemist to the Society, favoured the Council with his views on the management of the sewerage matter of towns and its agricultural application; reserving for the paper he was preparing on the subject, for the Society's Journal, the full details intended by him to illustrate and confirm the views in question. He first referred to the fallacious pretensions of many plans proposed for the extraction and concentration of manuring matter; and then explained the sanitary management of excrementitious matter in Belgium and in France, particularly noticing the recent valuable report made to the Board of Health by Mr. Rammell, on the arrangements on this subject in Paris, and to the Poudrette manufacture in that capital. He then proceeded to explain the difference in reference to the London sewerage, on account of the large amount of water which entered into its composition. He estimated this supply of water at 44½ millions of gallons a-day, and considered that all excrementitious matter, sooner or later, found its way in a comminuted state into this large mass of sewerage. He regarded rain-water, too, as being highly charged with manuring matter; and detailed some interesting results of experiments made on street-water as it rushed to the gully-holes of the sewers, which showed it to contain a much larger amount of soluble salts, especially salts of potash, than sewerage water, and proved that such washings from the streets improved rather than impaired the manuring quality of the sewerage water generally. The sewerage matter was in two states:—1. In solution; 2. In suspension. He explained that the solid matter in sewage was only the woody or fibrous refuse of solid excrement, while ammonia and the more valuable substances were retained in the liquid form. At present he was aware of no method to convert sewage into solid manure that *would pay*. It had been said that the liquid left after the removal of the insoluble portion of sewage, was "inodorous, tasteless," and might be thrown into the river; such a result might fulfil sanitary but not agricultural conditions. The question, however, was a double sanitary and agricultural one; and the two interests combined would greatly facilitate their general and special objects, which were much retarded while each party stood aloof. Professor Way then detailed the various substances proposed for the filtration of sewage, and the various precipitants to effect the subsidence of its grosser matters; he referred to the plans of Higgs, Moffat, Stotherd, Wickstead, Herapath, and Dover; to the peat-charcoal filter of the sewage manufactory company, at Fulham; and to gypsum, sulphates of iron, magnesia, and zinc; the alum salts, burnt clay, and peat and animal charcoal, as precipitants and filtering substances respectively. But no plan was efficient that did not include, in the solid matter obtained, the various salts dissolved in the original liquid. The milk of lime employed in Higgs' process clears the sewage from colour, but leaves in it nearly all the organic matter. London water, too, was hard, already holding carbonate of lime in solution; when quicklime was added a large precipitate, consisting of double the quantity of chalk, was thrown down, and thus increased, by so much comparatively inert substance, the solid matter obtained, 30 grains of chalk being obtained in this manner from every gallon of sewage liquor. He would prefer separating the sewage matter by itself; but even that would only con-

tain from 2½ to 3 per cent. of ammonia, and would not pay. He recommended farmers to avail themselves of the strongest and best manures, as occasioning less expense in the original cost, carriage, storing, and application. Many methods had been proposed to facilitate the mechanical separation of sewerage matter, and to deodorize it; but in all these the valuable salts were left behind. Peat and other charcoal did not arrest ammonia, as had been supposed, but absorbed it as gas by a peculiar power of surface, which the charcoal exercised; but water, having a tendency to unite with ammonia, washed this gas out again; charcoal, however, retained the solid matter, and deodorised it, but did not separate the soluble salts. He then referred to the application of burnt clay on soils to the purpose of absorbing manuring matter; but showed that the effect of carrying out manure to the field was very different from that of bringing a portion of soil to the manure, the relative proportion in this case deciding the result. Soil, in fact, could not be used as a filter; it could not economically be taken into the town and then out again into the fields. No plan, he believed, was at present known by which the whole of the sewerage matter could be obtained in a solid state, excepting by evaporation; and that of course was out of the question. Prof. Way was aware that every one who took a deep interest in any subject looked with particular favour on views which he himself entertained and had originated; and accordingly he felt a natural interest in the successful application of the silicates, to which he had often made reference in that room: he really believed, however, that these substances, or something analogous to them, were the only likely means by which the potash and the other saline matters could be removed from the sewage liquor in a solid state. But he considered it unwise for farmers to make manures, while they could purchase them at a cheaper rate than they could themselves manufacture them. Unfortunately those low lands that could most easily be reached by water were the very kinds that least required manure. Liquid sewerage, as a whole, he thought offered the largest prospect of success, as the whole of the manuring matter was in that case utilised. A disagreeable odour was occasioned by its sulphuretted hydrogen, but there was no great loss of manuring value. The usual outlets of sewers naturally occurred in those lower levels which, as he had just remarked, least required manuring, being beds of river alluvial deposits, consisting of clay nicely tempered with sand. The poor thin high grounds, particularly in sandy districts, were those which most required the aid of manure. Pumping the sewage up again was the only plan; but halfway measures would be a failure. The farmer should have the power of using it on levels as high as the towns. In some of these, as Exeter, situated on a circuit of hilly ground, it would be waste of power to bring the sewage down from them to the lower outfall, and then to pump it up again; but it might, he thought, be economically employed in contour lines around such towns. But, generally speaking, the distribution of liquid manure, to be fully available, should be effected on an extensive system; it was ridiculous for a place like Edinburgh, with its large amount of inhabitants, to supply liquid manure for only a few thousand acres; such excrementitious matter ought to yield manuring elements for hundreds of thousands of acres, if applied at once to the land.

Mr. Chadwick begged leave to say for his colleagues of the General Board of Health, that however strongly convinced they were of the superiority of the principle of applying the refuse of towns for cultivation, in the form of liquid manure, they would, nevertheless, have been glad if there had been better results from the various trials with precipitates of sewerage, and better promise than Professor Way's very important investigations into the patented and chief methods hitherto tried, yet gave them. He (Mr. Chadwick) had done what he could to facilitate experimental trial works for precipitates, as experiments; for there were many cases of towns so situated, as a small town near the sea-side, with the sea for the out-fall, with high cliffs behind, and with no land on the cliffs on which to apply it, even if the quantity were sufficient to pay for engine-power to lift it; where, unless the manure in the sewerage could be precipitated and rendered portable, there appeared to be as yet no alternative at present but to throw it away. Where, however, there were means for its application in the liquid form, it was mere waste of expense in labour and material—of the materials used in the process, as well as of the manure itself—to reduce it to the solid form from which it must again be liquefied; for, unless it were liquefied for application, half its effect would be lost. This result had been exemplified by Mr. Pusey in the trial of the comparative merits of the water drill and the dust drill. It had been elsewhere shown that the risks of loss were diminished, and the efficiency of guano was doubled by applying it in water. Mr. Herapath had told him (Mr. C.) in relation to a plan of precipitating town sewerage, with which it was to be hoped he might succeed, that the raw materials alone requisite for the production of a ton of solidified manure would cost about 7s. In other instances the cost was greater; but supposing it to be so, and supposing the distribution of the sewerage to be from such points as the reservoirs, to which it was proposed to bring it for precipitation from that point, for that 7s. 300 tons of liquid manure might be at once distributed directly on to the land, there to be safely held, not merely in mechanical suspension, but, as experience had shown, in chemical combination, and to be safely stored or prepared for the plant in Nature's own laboratory, the soil. When he first recommended this mode of application only single dressings were thought of, and it was supposed that the storage room required during the long intervals of the applications would be so enormous as to render the plan impracticable; but one most important point of successful experience for farms as well as for towns was, that they might go on pumping the manure into the land, on fallows, all the year round, except during the frost. From the filling of his tanks to overflow, with the liquid as well as the solidified manure, Mr. Kennedy, of Myer Mill, had been compelled to do so; and the permanence of the absorption, the complete

and satisfactory storage in the land, was shown on the crop, on which, as in steps, every extra dressing with liquid manure was distinguishable. Experience was accumulating also as to the superior quality, as well as the quantity of the produce from the sewerage of towns. In the course of the drainage-works carried on under the Public Health Act, it was often necessary to change the outfalls and the courses of old sewers, when up started claimants to compensation, on the ground of prescriptive uses and rights, and for the loss of a manure yielding produce unequalled in quality. In one case some surprise was created by the pains taken by a farmer to get himself appointed surveyor to a town under the Public Health Act. It was found that he had done so in order to prevent the diversion of an outfall, of which he had long made quiet and unobserved use, for the production of a superior Grass. When he was assured of the continuance of his supply for a term of years, at a moderate rental, he resigned his surveyorship. In another case, a market-gardener came forth and objected to the diversion of an old sewer from which he had grown the best produce, and, amongst other things, the finest Mignonette of the richest scent that during many years had been sent to Covent Garden market. The difficulties in the extension of the system were not upon any doubt as to the certainty and economy of the means, or as to the value of the produce on the part of all disinterested persons who had been able to examine the various working examples. In agriculture, however, as they were too well aware, adoption did not as yet invariably follow proved success. There were, moreover, the usual obstacles: the tenant had no capital to lay down apparatus, and wanted the owner to do it, commonly gratis. Then there were not sufficient powers under the Public Health Act to enable the local boards to lay down apparatus on farms, and give the use of the apparatus, as well as the supply of sewerage, for a rent. Often the most suitable lands for the application of the sewerage were the common and the waste lands. Thus Coventry, where drainage works under the Public Health Act were in the course of execution, was belted with Lammas lands; but the General Board had no means of settling equitable terms of compensation to the several parties, as in the case of enclosures, otherwise the proper course would be to take the wastes, to enclose and drain them, and put down the distributary apparatus, and then relet them, with the right of the free use of the liquid manure. They had as yet no legal rights of easement for carrying liquid manure pipes beyond the districts of the local boards; otherwise there was no monopoly of the sewerage by the occupiers or owners of the land at the immediate outfall, as was commonly assumed; and where the quantities were sufficient they might expect to see sewerage pipes radiating for many miles from towns. Neither was it necessary, as supposed, that the sewer manure should be distributed only in the direction of the flow naturally by gravitation. Wheresoever it was necessary to lift solid manure, there, in large quantities, liquid manure could be lifted at a cheaper rate. In the metropolis there were large Cornish engines doing duty by lifting 87,000 gallons of water 100 feet high for a shilling; the expense of the lift by the smaller engines was greater, but still the expense was, even with the highly-diluted manure, much less than lifting the solid manure by carting; and it was important to observe that to whatever height liquid manure was lifted, there was the benefit available of power of a return distribution by falls, by shedding. In one instance there were reliable estimates for lifting the sewerage, by two or three lifts, over the high grounds to the north of London, and delivering it as far as 20 miles off, at an expense of twopence per ton for the delivery. From two towns under the Public Health Act, distributary works were expected to be in operation this season; from about ten others at the commencement of the next season. As the legislative facilities for which they had applied from year to year were yielded, and the administrative reductions were removed, other towns would rapidly follow. In the meantime the number of the farms upon the new principle were increasing, and, with such important examples and expositions founded upon it as were given by Mr. Mechi, the towns, and the farmers resident near them, would be led to appreciate the advantages within their power.—In answer to some questions, addressed to him by Mr. Alcock, M.P., as to the cost of distribution, Mr. C. stated that the estimates of conveyance of sewerage to long distances were founded on the experience of the conveyance of water to long distances for the supply of towns, which put all conveyance or lifts by carts out of competition. On some trials of the distribution of solid and liquid manures from farms, it was shown that the cost of removing equivalent quantities of manure was—of 15 loads of solid manure by cart, £1 7s.; of 15 loads of liquid manure by water-cart, 18s. 9d.; of 15 loads of liquid manure by 800 yards of hose and jet, 1s. 9d.; of 15 loads of manure distributed by means of a short hose from a stand pipe by a fixed steam-engine, 6d.—In answer to some questions of Mr. Livesey as to the expense of pipage, Mr. Chadwick stated that the expense on the farm referred to as a leading instance, that of Mr. Kennedy, the expense was £2 10s. per acre. The hydrants were there placed about one to more than 40 acres. Mr. Mechi's pipage was closer, and his hydrants about one to 11 acres. His expense, £4 an acre, it was to be observed, included the expense of all his failures. The pipage of the high sheriff of Lincolnshire was closer still, and he appeared to have one hydrant to every 3 acres; but taking his the maximum expense of £7 per acre, and let that be compared with the average expense of forming water meadows, £15 per acre as in Wiltshire, or as £40 per acre, the expense of the Duke of Portland's water-meadows at Clipstone.—Lord Kinnaird, who said he was adopting the system himself, considered the maximum outlay low as compared with outlays to which they were accustomed for less return. He considered the outlay as a means to a large economy. —Sir John Johnstone asked Mr. Chadwick whether he considered the want of success of the London Sewerage Manure Company was due to financial or other causes. —Mr. Chadwick stated, to financial causes. The late

Mr. Smith, of Deanston, who had taken shares in the company, had protested against the arrangements, and declared that they must end in failure. In respect to the effect of the sewerage distribution, the success might be seen on French Beans and Cabbages, as well as on Currant-trees and Strawberries, and the limits of the distributing jet were perceptible, in the increased size and superior appearance of the produce.

Mr. Livesey ventured to allude to the valuable illustrations of liquid manuring on Mr. Kennedy's and Mr. Telfer's farms in Ayreshire. Mr. L. witnessed, on the 24th of May, in the present year (a period of such unusual drought, that, on the Sunday previously he heard the prayer for rain read at Fortwilliam, so serious were the losses amongst the lambs in that locality), the second cutting of Italian Rye-grass on Mr. Telfer's farm, where 48 cows are kept on 50 acres of land, 25 of which are under the pipe-distribution system. So valuable does this system of distributing manure appear that it is beyond the question of comparison between solid and liquid; it is in such instances as that alluded to a question whether farmers have a crop or go without it altogether; for by no other means, under similar circumstances, can they bring about a crop at all. He had laid down 52 acres under this system, and looked forward with much pleasure in being in a condition next year, at Lincoln, to offer an inspection to any of the members of the Royal Agricultural Society, who might be pleased to honour him with a visit; and as his residence is within a few miles of that city, where the meeting was to be held, he trusted that gentlemen would do so. Mr. L. not having yet heard of any other person in that county, where its introduction will be canvassed by much intelligence, sought to show that its results may be satisfactory in a commercial point of view; but could scarcely agree with Mr. Mechi that £4 per acre would cover the pipage and working power, tanks, &c., per acre. Mr. Livesey would be more disposed to say £7 per acre to carry out such pipage alone as would be conveniently disposed for distribution with short lengths of hose, where, as Mr. Mechi states, the wear and tear, and he might add the cost of labour also, is the main item of account. Mr. Livesey had for every 3½ acres one hydrant, so that 60 yards of hose would cover the whole circle; 45 would do it easily, with 60 feet of jet. He would be glad to see an efficient distributor offered to the public in lieu of the jet, so that the fluid might be regularly spread, and not in strokes, as noticed by him on Mr. Kennedy's Rye-grass, where the application expressed itself in segments on the crop. He would observe that the implement which Messrs. Carrett and Marshall, of Leeds, have kindly undertaken to construct for him, and is to be shown at Gloucester, is intended to be subservient to irrigation as well as other machinery; and if such an implement shall be successful in its operations, there may be instances where considerable benefits could be derived, and this reminded him of a position at once suited to its application, and if Mr. L. might take such a liberty without being personally acquainted with the proprietor, but whose valuable services to this Society are so well esteemed, he would mention Colonel Challoner's park, through which, whilst riding on Saturday last, he saw a most beautiful and luxuriant crop of cultivated Grasses; and it occurred to Mr. Livesey that when this magnificent crop, so different from the usual stunted growth of park Grass, was stacked and an abundant aftermath was desired, that 3 cwt. of guano to the acre, followed by water from the reservoir below, under the agency of the Portable Steam Engine Pump to which he had alluded, would be a very likely means of effecting it. He was desirous of expressing his thanks to Mr. Mechi for the valuable assistance conferred by him during the arrangement of his pumps and other necessary apparatus.

Mr. Mechi considered there was no practical difficulty in conveying town sewerage to agricultural districts, except that farmers and landlords must first be convinced that town sewerage is the best guano in a liquid state. He had found practically that no amount of solid manure would effect, in a given time, equal results with liquid manure, especially on pasture. He considered that, allowing six individuals as amply manuring one acre, 350,000 acres would, if necessary, absorb all the town sewerage of London with its 2,000,000 of inhabitants. Its cartage in the country cost at least 6d. per ton per mile; and as liquefied manure could be conducted at a twelfth or less of that cost, that is the most desirable condition for transmission; all solid manures might be fluidised, and sink immediately to the roots of plants, as at his farm; consequently the new fibres of growing plants, deep in the soil, receive their food in an available condition. Mr. Mechi then referred to Professor Way's papers on the power of soils to fix ammonia, and stated that in strong clay soils he had, whilst irrigating, caused the drains, at 5 feet depth, to discharge manure-water having both colour, smell, and fertilising properties, although he had hoped all these might have been arrested by the soil. He concluded his remarks by entering largely into the details of pipage, gutta percha tubing, and the general management of irrigation with manure. Mr. Mechi then invited the members to inspect his arrangements in their present improved state; and he should feel gratified in finding that any expenditure of his own, made by way of trial and experiment, should have eventually led to sound practical experience, of which others might so freely avail themselves. He hoped on the 20th of next month to meet many whom he then saw present, at his "gathering" at Tiptree, where the whole of his operations would be laid open to their inspection and friendly discussion. In the course of his details, Mr. Mechi gave to the members a most graphic account of the manner in which, by means of his great tank, and the incessant action of currents of air, animal matter of every form and degree of solidity was rapidly assimilated into liquid-manure, and hurried off daily with the resistless force of steam-power through his system of pipage over his land. The discussion closed with an interesting detail of facts connected with steam-power; price, number, material, and coating of pipes; fresh or ripe manure; and action of silicates on strengthening Rye-grass and other siliceous plants.

On the motion of Lord Kinnaird, seconded by Mr.

Chadwick, the Council passed a vote of thanks to Prof. Way, for his most able and instructive statement: his lordship remarking, that Prof. Way's views on the value of manure in a liquid state fully agreed with those expressed in Scotland by Prof. Johnston and Prof. Anderson, the successive consulting-chemists of the Highland Society; and he suggested a system of liquid-manure distribution, from tanks in towns along the lines of railway, through a ramification of small pipes in different localities. The President, in conclusion, alluded to the great liberality of Mr. Chadwick, in allowing the Society to reap the advantage of his great experience on the use and application of town sewerage; and to the offer of the High Sheriff of Lincoln to submit his arrangements next year to the inspection of the Society. His lordship thought it unnecessary for Prof. Way to apologise for any incompleteness he might suppose to have been left in his statement. The Society had applied tests to agricultural machines, for the purpose of ascertaining when they failed and when they succeeded in the object of their construction; and by these criteria they had rendered invaluable aid to the progress of agricultural mechanism, and had gradually educated the implement-makers in the perfection of their manufacture. The farmers were in like manner obliged to Prof. Way, who, by the test of science, determined the truth and economy of those plans which were connected with cultivation and the application of chemistry; teaching them to feed their lands, as well as their bullocks, to the greatest advantage.

The Council then adjourned to their monthly meeting on July 6.

A Monthly Council was held at the Society's House in Hanover-square, on Wednesday, the 6th of July. The following members of Council and governors of the Society were present: Lord Ashburton, President, in the chair; Lord Bridport, Hon. R. H. Clive, M.P., Sir Matthew White Ridley, Bart., Sir Charles Lemon, Bart., M.P., Mr. Raymond Barker, Mr. Barnett, Mr. Hodgson Barrow, M.P., Mr. Blanshard, Mr. Bramston, M.P., Mr. Brandreth, Mr. Cavendish, Colonel Challoner, Mr. Commerell, Mr. Foley, M.P., Mr. Gadesden, Mr. Garrett, Mr. Grantham, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hornsby, Mr. Kinder, Mr. Paine, Mr. Chandos Pole, Mr. Pusey, Prof. Simonds, and Prof. Way.

Finances.—Mr. Raymond Barker, Chairman of the Finance Committee, presented to the Council the report on the accounts of the Society to the end of the previous month; from which it appeared that the current cash-balance in the hands of the bankers was £2,249. He also reported to the Council the final settlement of all claims on account of fines for non-exhibition at the Lewes meeting.

Prize Essays.—Mr. Pusey, Chairman of the Journal Committee, reported the following awards made by the Judges of Essays and Reports, competing for the prizes of the Society:—

I. To John Haxton, of Drumnod, Fifeshire; the Society's Prize of Thirty Sovereigns, for the best Essay on the Management of Light Lands, consisting principally of very friable, dry, and loose sand, with some aluminous (or clayey), but no calcareous matter, such as those on sand of the plastic clay, iron-sand, millstone grit, old red sandstone, and granite.

II. To Robert Vallentine, Farm-manager to the Royal Agricultural College, Cirencester: the Society's Prize of Ten Sovereigns, for the best Essay on the Cultivation of Beans and Peas.

Gloucester Meeting.—Mr. Raymond Barker, Vice-Chairman of the General Gloucester Committee, reported the satisfactory completion of the arrangements for the Society's ensuing Country Meeting in that city. The Council cordially greeted the announcement that the French Government had intimated, through their consul-general in London, their intention of sending a special deputation to attend the meeting. The General Gloucester Committee had given instructions that every mark of attention should be paid to these distinguished guests.

Steam Boiler.—Colonel Challoner, Chairman of the Implement Committee, laid before the Council the report of Mr. Amos, the consulting-engineer to the Society, on the result of his visit to the works of Mr. Batley, at Northampton, for the purpose of inspecting and testing the ten-horse steam boiler which had been constructed by Mr. Batley for the Society, and was intended to supply steam for working the fixed engines in the Society's trial yard, at its country meetings. Mr. Amos had the satisfaction of finding that Mr. Batley had made every effort to meet the wishes of the Implement Committee, and to complete the boiler in due time. It was found, on being subjected to high pressures of water and steam, to be fit for immediate use; and there was no doubt that it would reach Gloucester in proper time for the Society's steam-engine trials.

Vacancies.—The Secretary having reported the vacancies occasioned in the Council by the lamented loss of the Earl of Ducie and Professor Sewell; the President announced that, agreeably with their standing regulation, these vacancies would be filled up by the Council at the ensuing monthly meeting on the 3rd of August.

Seasoning Wood.—The Hon. R. H. Clive, M.P., sent to the Council the following communication from Mr. Lloyd, of Leaton Knolls, Salop:—

"As the communication of the enclosed memoranda, drawn up by my gardener, and stating to me the results of various experiments in seasoning young timber, by immersion in lime-water, may be interesting and useful to many of our brother landowners, I enclose them, together with the specimens referred to in it, to be submitted (if you should think fit) to the attention of the Royal Agricultural Society at their next weekly meeting. I may add to the enclosed statement that the timber intended for roofing, gates, &c., should first be shaped and fitted, and then taken to pieces and placed in the lime-water; as the wood, when taken out of the pit and dried, becomes so hard, and the grain so gritty, that it cannot well be cut or planed; and, if placed, when tenoned and framed together in the pit, would swell, and burst the joints."—J. A. Lloyd.

"The accompanying specimens of timber, which I now submit for your inspection, are the results of some experiments carried out in 1843 and 1849. Pieces of the woods, as labelled, were soaked for fourteen days in strong lime-water; and, after

being taken out, and allowed to dry, were placed, with other pieces not soaked, upon a grub-eaten floor, and the results are what the specimens now exhibit. While the pieces of young Larch, No. 1, is perfectly sound, No. 2, a piece of the same tree, but not soaked, is completely perforated by grubs; No. 3 is a piece of Sycamore plank soaked in lime-water, No. 4 a piece of the same plank not soaked. No. 5 is a specimen of Lime tree plank soaked, the wood quite green when put to soak. No. 6 is a specimen of Lime tree, the wood quite dry when put to soak. The grub has not attacked either of them, and it appears that the lime-water penetrates the green wood as deeply as the dry. No. 7 is a specimen of peeled Larch soaked in 1843, and No. 8 a specimen of the same tree not soaked in lime-water. No. 9 is a specimen of unpeeled Larch soaked in lime-water in 1843, and No. 10 is a specimen of the same tree not soaked. Moreover, I may remark, that the timber which is soaked is harder than that not soaked. The tank for soaking timber here is 26 feet long, 5 feet wide, and 4 feet deep, dug out of the clay, and the sides and bottom lined with wood, at an expense of about 70s., exclusive of the value of the timber in the rough."—J. WILSON.

The President remarked that simple processes were too apt to be forgotten, although in many cases very adequate and efficient for required purposes; facts were first important, theories were afterwards valuable in extending their use.—Prof. Way referred to the advantages attending the circumstance of the wood being cut up in pieces before being soaked, and thus presented a greater amount of surface: there were many other modes of soaking wood, but they were all comparatively expensive, and required a greater amount of preparation for the process.—Sir M. W. Ridley thought the action of the lime consisted in solidifying the albumen.—Mr. Brandreth thought it effected a change in the saccharine juices of the wood.—Mr. Hammond thought the subject a very interesting and important one, and hoped Prof. Way would give it his attention.—On the motion of Mr. Clive, seconded by Mr. Pusey, the thanks of the Council were ordered to Mr. Lloyd for the favour of these specimens and the statement accompanying them.

COMMUNICATIONS were received:—1, from Mr. Thomas Martin, on the importance of taking measures to improve the moral, social, and physical condition of the rising generation of the agricultural labouring classes; 2, an invitation from Mr. Beckford, of Ruxley Lodge, near Esher, in Surrey, for the Council, or any of its members, to inspect the daily working of Samuelson's digging machine, at a farm in Mr. Beckford's neighbourhood, near Kingston-on-Thames; 3, an invitation from Mr. Bailey Denton, for the members to witness the labourers' draining match, intended to take place on the estate of Mr. Parkins, at Chesfield, near Stevenage, Hertfordshire, on the 22nd of July; 4, an invitation from the Rev. Samuel Smith, of Lois Weedon, near Towcester, for the inspection of his growing crops, as results of his improved system of cultivation.—The Council ordered their usual acknowledgments for the various communications submitted to them, and adjourned to their monthly meeting on the 3rd of August.

FRENCH INDUSTRIAL EXHIBITION.—The Earl of Clarendon, her Majesty's Principal Secretary of State for the Foreign Department, has transmitted to the Society, through Mr. Addington, the following communications relating to the Great Industrial Exhibition of France, to be held at Paris in the year 1855.

Foreign Office, July 6, 1853.

SIR,—With reference to my letter of the 30th of April last, enclosing a copy of a letter from Count Walewski, the French Ambassador at this Court, announcing the intention of his Majesty the Emperor of the French to hold a Great Industrial Exhibition in Paris in May, 1855, I am directed by the Earl of Clarendon to transmit to you a copy of a further letter from Count Walewski, stating the decision which has been come to by the Government of his Imperial Majesty in regard to foreign prohibited goods which may be sent to the Exhibition; and I am to request that you will move the Royal Agricultural Society of England to give the greatest possible publicity to the liberal intentions of the French Government, as stated in Count Walewski's letter.

I am, sir, your most obedient humble servant,

(Signed) H. U. ADDINGTON.

To James Hudson, Esq.

London, June 29, 1853.

MY LORD,—In reference to the Great Exhibition, intended to be held at Paris in 1855, many foreign manufacturers have inquired of the Minister of the Interior: 1, whether products, the importation of which into France under general regulations is prohibited, will be specially admitted into that exhibition; and 2, whether, at the conclusion of the exhibition, those products will be required to be re-exported, or may be sold off on the spot. These two questions, my Lord, have received a solution conformable with those enlightened views which led the Government of his Majesty the Emperor in the first instance to decree the Great Exhibition of 1855. It has accordingly been decided, not only that such prohibited merchandise shall be admitted into the Exhibition, but, further, that it may at the close of the Exhibition, and at the will of the exhibitors, be either re-exported free of all duty, or sold in France for internal consumption on payment of a duty of 30 per cent. on its value. These arrangements will be included in the general regulations at present in the course of preparation; but, on account of the general impression which appears to have been already made among foreigners, by the rule affecting prohibited merchandize intended for the Exhibition, I am instructed to have the honour of informing your Excellency of the special resolutions adopted in reference to this point by the Government of his Majesty the Emperor. Your Excellency will, perhaps, kindly consent at once to convey to the industrial and manufacturing subjects of her Britannic Majesty a statement of the regulations which have thus been made. I have, &c.,

(Signed) A. WALEWSKI.

To his Excellency the Earl of Clarendon,
&c. &c. &c.

NEW MEMBERS.

The Marquis of Bath, of Longleat Park, Wiltshire, and Tilney-street, Park Lane, London, was elected one of the Governors of the Society.

The following new members were elected:—

Barton, Charles, Holbrook House, Wincanton, Somersetshire
Beauchamp, The Earl, Madresfield Court, Worcester
Blakey, John, Sleaford, Lincolnshire
Breavington, William G. K., Sutton, Hounslow, Middlesex
Brogden, John Thomas Nathaniel, Lincoln

Boyle, Thomas, Frolesworth, Lutterworth, Leicestershire
Butt, Henry, Kemerton, Tewkesbury, Gloucestershire
Cartar, William, Boughton, Feversham, Kent
Castree, Charles William, Gloucester
Coke, H. S., Neath, Glamorganshire
Collinson, H., The Wood House, Kidderminster, Worcestersh.
Corbet, Henry, Farmers' Club, New Bridge-street, London
Crossley, Luke T., Hanklow Hall, Nantwich, Cheshire
Darbishire, S. D., Pendyffryn, Conway, Carnarvonshire
Deere, Richard Tack, Chepstow Terrace, Bayswater, London
Dickenson, D. F. D., Ulverstone, Lancashire
Eggar, James, Binsted, Alton, Hampshire
Gibbons, R. W., Abbot's Hill, Beaford, Crediton, Devonshire
Harkness, Thomas, Upper Sackville-street, Dublin
Henderson, William, 96, Gloucester Place, Portman Sq., London
Hitch, Samuel, M.D., Sandywell Park, Gloucestershire
Horford, Summers, Clarveston Grange, Narberth, Pembrokesh.
Kay, Richard, Forcett-Valey, Aldborough, Durham
Lambert, Charles, Sunk Island, Otteringham, Hull
Leach, R. Valentine, Vernou House, Britton Ferry, Glamorg.
Lee, Thomas, 5, Somers Place, Hyde Park, London
Lewis, J. L. G. P., Henllan, Narberth, Pembrokeshire
Mapplebeck, William Batty, Birmingham
Martin, John, Barmer, Fakenham, Norfolk
Melville, Rev. Edmond, St. David's, Pembrokeshire
Morgan, Morgan, Bodwigoed, Pontriffydd, Glamorganshire
Nunn, William Travers, Yeldham, Halstead, Essex
Parry, Thomas Gambier, Highnam Court, Gloucester
Pearson, Charles, Berwick-on-Tees, Yarm, Yorkshire
Ponsonby, Hon. Ashley Geo. John, M.P., Hatherop, Fairford
Price, William, Glan Turch, Swansea, Glamorganshire
Rhodes, Christopher, Little Oat Hall, Burgess Hill, Sussex
Risdon, William, Dolton, Crediton, Devonshire
Ruck, Edmund, Castle Hill, Cricklade, Wiltshire
Saunders, Samuel, Russell Mill, Market-Lavington, Wiltshire
Smith, David, Yniscedwin Iron Works, Swansea Vale
Smith, William, Whinchcomb, Gloucestershire
Sparkman, John Little Marcle, Ledbury, Gloucestershire
Stothert, Henry, Bath, Somersetshire
Strick, Thomas, Swansea, Glamorganshire
Thompson, Alexander, Kirknewton, Wooler, Northumberland
Trinder, Edward, Cirencester, Gloucestershire
Troyte, A H. Dyke, Huntsham Court, Hampton, Devonshire
Vavasour, Sir Henry Mervin, Bart., Spaldington, Yorkshire
Wainman, William Bradley, Carsehead, Skipton, Yorkshire
Washbourn, George, Gloucester
Wemyss, James Robert, Gloucester
Williams, T. Playfair, Wessington Court, Townhope, Hereford
Willis, R. B., Elderbeck, Pooley Bridge, Penrith, Cumberland
Wicks, John, High Leaden Court, Gloucester
Wood, W. Bryan, Bainbridge, Chippenham, Wiltshire
Wood, Miles Astman, Ledbury, Gloucestershire.

MEETING AT GLOUCESTER.

The west of England, or, to speak as we travel, the Western line, has so far had quite its fair share of attention from the Royal Agricultural Society. Celebrating their opening day at Oxford in 1839, the Council came on to Bristol in 1842, proceeded still further down, to Exeter in 1850, and now again return to Gloucester in 1853. Acting, then, on the principle that each district should in turn have the advantages of a visit from this eminent institution, it is a question whether Worcester had not in reality a call over the more favoured Gloucester. At each of the three other cities we have named as the scenes of different celebrations—Oxford, Bristol, or even Exeter—the county of Gloucester had ample opportunity for either exhibiting at, or merely attending the meetings. Worcester would have been something more like breaking fresh ground; whereas, in Gloucester and its vicinity we are already well known, and the visit comes more like the re-appearance of an old friend, than the first introduction of a comparative stranger.

The city of Gloucester, however, did not, in this instance, rest its claim exactly on its own merits. Independently of what it could offer in the way of site and general convenience, it had the more weighty recommendation of forming something like a connecting link between the object of the Royal Agricultural Society and the farming of South Wales. This, of course, was only effected by its railway accommodation, and this, we believe, mainly determined the selection of the Society. We see no reason to quarrel with the choice, although we fear the expectations upon which it was arrived at have been scarcely realized. We shall have to penetrate more into the heart of Wales itself before the influence of the Agricultural Society can be reckoned upon accomplishing much general good there. It is the small poor farmer, above all others, that you must visit in his own home, and it is with such as him that South Wales abounds. Candidly speaking, they were but badly represented at the Gloucester Meeting. The premiums offered for their especial competition brought together but a poor display, while the people themselves furnished by no means a striking feature in the character of the company. In a few years from this—certainly by the time "the turn" comes once more round—the railways will be extended to Hereford, and most probably to Monmouth. We may by then arrange a meeting that will come much more legitimately into "the South Wales" district.

Putting thus for the present those for whose especial benefit the scene of action was decided on almost entirely out of the question—regarding the Meeting only as one of the Royal Agricultural Society of England, it cannot be recorded but as eminently successful. Those facilities of transit which some of the more neighbouring quarters so lamentably neglected were fortunately open to other districts; and we are happy to add, that

while a few only stood idly by, a very large majority made the best use of those means offered for their service. The yard was never so well filled. The implements exceeded by some hundreds the entry of any former year; while the stock, if in some few classes hardly so good as it has been, was yet numerically strong and generally excellent.

Still the Gloucester Meeting was not without some little difficulty or so to contend against; and the worst of these came in the way of a prejudice. It had been announced some time since that the Society was at last going to act up to its original intentions, and that a show of breeding stock would become in fact that it professed to be. Pigs that could not stand, and sheep that found a difficulty in respiration, were no longer to be considered as in the height of condition. An animal, it was judged, should have something of a constitution as well as a character; and that when he was purchased for the express purpose of improving a breed, he might be really found capable of doing so. Nothing has brought the Agricultural Society into so much ridicule, nothing has tended so much to retard that common feeling of esteem and respect it is now coming to be held in, as the systematic manner in which the procreative powers of prize animals were thus abused. The Council or Directors of the Society, though of course fully cognizant of the evil, were long before they could gather courage sufficient to grapple with it. To the late Lord Ducie, indeed, the credit is almost entirely due of having in his official capacity unhesitatingly denounced the practice. He followed this up, too, by taking the several opinions of those practical men who had acted as judges of stock at the different meetings. These were found so far to agree with him, that a plan was at length sanctioned by the Council for disqualifying any over-fed beast from coming into competition for the prizes offered by the Society.

It is only right to say that, however well the world at large might be inclined to welcome this, the breeders themselves have thus far taken it by no means so kindly. As one gentleman stated in the *Mark Lane Express* of last week, it has been looked on by many as the very "death-warrant" of the Society. We hear that very many animals were kept at home, with the fear of this wholesome regulation before the eyes of their owners; although we believe their apprehensions must have extended the limit of the prohibition far beyond where it was actually taken. In the yard, still, there was very gratifying evidence of what this mere announcement, of itself, had effected. You came upon lively pigs; active, healthy-looking sheep; shorthorns with something of an outline; and Devons whose beautiful symmetry was allowed to develop itself fairly and honestly to the eye of the spectator. It would be wrong, however, to record the effect of this prologue as altogether general in its action. There were many old offenders yet at their old tricks of pampering; and many that, we must add, again escaped unpunished. One of the first "sights" that attracted the visitor, on entering at the bottom of the yard, was a white *breeding* sow, with a litter of pigs by her side, in such a hopeless state of obesity, that the jury at once rejected her. With her, in the same condemned list, were associated a couple of rams, which, like the Romans of old, preferred taking their meals in a reclining position, and could by no means be induced to get upon their legs. These, though, were very rare exceptions: in fact, as we have heard, there was considerable difficulty in persuading the juries to disqualify anything; and any improvement which was observable—and there was a considerable advance in this respect—was far more attributable to a dread of what these gentlemen *would* do than that they *did* do. Unless such duties be a little more strictly performed, the abuse will soon regain its former height, and the Royal show in July and the Smithfield show in December come again very much to the same thing—at least in appearance.

We are well aware there is some difficulty here. The grand object to attain is an animal that will fatten cheaply and quickly, and with some it may be almost impossible to show them low in flesh. Still we are inclined to regard this, as far as the Royal Agricultural Society is concerned, as rather exceptional than general. For one beast or sheep exhibited that has been kept down, how many are there fed up by almost every conceivable, and too often, as we fear, injurious means? At the meetings of the Highland Society the animals are shown in a far more becoming condition; and it is well known that prize animals from the English have been rejected almost immediately afterwards at the Scotch meetings, from the over-fed state in which they were sent. In 1843, for instance, some of Mr. Bates' shorthorns took the prizes at Liverpool, and thence went direct to Berwick-on-Tweed, where, though greatly admired, they were at once refused. What we in England had passed over, our northern friends declared was not in a fit state to regard as a breeding animal.

We have dwelt thus long on an abuse that we feel the Royal Agricultural Society has yet to deal with. The jury system does not promise to answer; while we can only add, that if the judges will do their duty, there can be no occasion for the services of this new set of officers. We believe there are no juries in the Scotch Society.

Thus much for one alteration. The progress of

the meeting will introduce us to another. On Wednesday—after a hard week's work, and the result of whose investigations will be found further on—the implement judges settled their awards, and had the different stands ready for the admittance of the public. To fill out this day, the Council brought forward the dinner from the second to the first—an alteration that resulted far more favourably than might have been anticipated. Notwithstanding the impossibility of doing anything like justice to both the implement and stock exhibitions in one day, it is very certain that many visitors—and amongst them such as have most need to learn — can only afford to give one day to the whole. With a late hay harvest on, and very "catchy" weather to proceed with it, such was precisely the case this year. The "one day" men commonly decided on Thursday, when they could "see all;" and Thursday turned out a thorough English wet day, beginning quite early enough to stay many from starting, and preventing those who did come from making anything like the best of their time. The very heart, consequently, of the Gloucester Meeting, was centred in the opportunity afforded on the last and "shilling" day. Would it be too much to ask for a successive three days' Exhibition of both stock and implements? We cannot help thinking it would add both to the funds of the Society and to the convenience of the public. It is not every town, either, that is so well provided for taking visitors where and almost when they like as Gloucester—and so despite the success on this occasion, we question very much whether it would not be better to return to the second day for the dinner, or at least to fix it for one, when the public may have the opportunity of attending it after having seen the whole of the Exhibition.

The dinner on Wednesday brought together nearly eight hundred guests, more or less interested in the pursuits of agriculture. The names of the most distinguished of these will be found in the report, as well as the different addresses delivered on the occasion. We can sincerely compliment Lord Ashburton on the ability and tact with which he presided, as well as the Stewards of the dinner on the completeness of their arrangements. Indeed, we know of few such large parties where the convenience and comfort of those attending them are so carefully studied as at these annual gatherings of the Royal Agricultural Society. In place of an overheated atmosphere, crowded tables, and a scramble for something to eat—too common characteristics of an English public dinner—you are sure of ample room, efficient attendance, and good ventilation. A man may there enjoy what the majority of course come for—the gradual progress down the toast list. In the treats of this kind provided for the Gloucester festival, none perhaps was so heartily relished as the speech from Judge Haliburton, the venerable author of "Sam Slick." Though, naturally enough, at first regarded as the "funny man" of the piece, this gentleman told his audience two or three home truths that are not likely to be forgotten. Sir Roderick Murchison, Lord Harrowby, and Sir John Shelley were also very happy and effective in what they had to say; while the absence of Mr. Pusey, we may report in the truest sense of a conventional term, was a source of very general and sincere regret.

The Royal Agricultural Society has long been regarded as the landmark of English agriculture. It is both the index and the guide to our progress. As such we may record it as never having looked or promised so well. It must number day by day more members, fuller meetings, and greater results. If, then, in our present notice, we have dwelt somewhat more on its few defects than its many virtues, it is only with the best intentions, and with the one hope, that the more the former are exposed the more likely are they to be removed. Of the general management, of the gratuitous services of those gentlemen who year after year devote their energies to the Society, it would be difficult to speak too highly. They are the farmer's friends indeed; and if he cannot appreciate them without our word, we are afraid he will be as little likely to do justice to himself as he is to them.

A FEW REMARKS ON THE PRIZE ANIMALS OF THE GLOUCESTER SHOW.

(FROM A CORRESPONDENT.)

HORSES.

The prize stallion of the year was a Suffolk horse, of very great power; the heavy bulk was less than of previous years, and the general appearance much more active and muscular. The neck was rather disproportionately short, and the head large—two qualities which adhere to the horses of Suffolk. The bones of the legs were thin and flat, with large joints and broad caps, all signs of bodily vigour. The hind legs were long from the hock to the turn of the thigh, but not so much as to form a very serious objection. The feet were large and well adapted, high rather than flat, and tapering with the proper direction of point. The colour was the characteristic of the breed—chestnut, with a lighter shade in the mane and tail, and the well-known white stripe down the face, dotted betwixt the eyes, and losing the white in a point before reaching the nose. In this animal the stripe scarcely extended beyond the dot, and in that respect a small deficiency existed. The body was very compact, close, and well-ribbed, coming quite up to the character of the "Punch"—the old distinctive name of the Suffolk horses. This stallion formed much the best of many shows, and the judges could have experienced little difficulty in making the award.

The second prize went also to a Suffolk horse; and in this award similar merit must be allowed, but with more qualification. The body was deeper than that of the last animal, and the leg shorter, while there was wanting the appearance of muscular activity which is so very desirable in draught horses. On the other hand, the neck, head, and face were superior to the first prize; the crest was higher, the neck longer, and the shoulder more oblique and tapering, and the arm wider and more powerful. The colour was better, being darker, and more hardy in appearance. The legs were faulty, being thick in flesh and round in the bone, capped knees, and full thorough pins. No objections could be found to the second merit in this case, owing to the heavy body and disproportionate appearance of muscular activity. The two awards could not be disputed.

The first prize of the younger stallions was also a Suffolk horse, of considerable promise as a draught animal. The colour was the best of all the Suffolks that were exhibited, being a very dark chestnut over the whole body, and nearly annihilating the whiter mane and tail and the white dot in the face. We like a dark colour, as denoting a hardihood which should attach to every animal of exertion. The fore-quarters of this young horse were very strong and powerful, probably somewhat coarse, especially in the legs; the neck was lengthy, crest high and well arched, joining the shoulders in an elevated taper of the withers. The head was comparatively small, and the ears fine and agile—a good property in any refined organization; on the other hand, the hind parts were objectionable in the quarters, coarse joints, and the knees standing cow-legged. These last properties are rather heavy objections in horses of any kind.

The second prize for young stallions was given to a Suffolk horse of more promise than the last award. The fore-legs, shoulder, and neck were far superior to any horse of the show, being straight and clean, oblique and well arched; the head small, and finely tapered to the nose, broad betwixt the eyes, with the proper white dot. The hind parts were not quite so good, being rather long and lean in the thigh. The bones of the legs were clean and thin, and the feet hard-hoofed with lengthy pasterns. The body was uncommonly close and well ribbed, and deep and round, with proper length. The neck, though short, was finely arched from the withers to the root of the ears. The arm was very wide and powerful for a horse of two years old, and the whole symmetry appeared to our judgment as being very far superior to any horse of the exhibition. In this opinion we were joined by the majority of the inspectors of animals.

The prize for roadster stallions went to Yorkshire, in a very handsome animal of moderate size, but most complete symmetry. The body bay in colour, with black legs, mane, and tail, were truly Yorkshire, and their properties were never better represented. The lengthy neck always attends these animals—a sure sign of muscular power and action. In this horse the neck was sufficiently long, but thick at the junction with the head, which was itself straight in the face, and hollowed downwards from the eyes to the nostril. The contour was handsome, but the whole animal was too small for the special purpose, and too slender in the bone. We fear to put our opinion in opposition to the judges; but our conclusion is in this case supported by many very eminent inspectors.

The prize for stallion ponies rested near Bristol with a roan-coloured pony with a cream-coloured mane and tail. The fore and hind feet being white above the fetlock halfway up to the knee, appeared to us to be too gaudy, when joined with a white face from the ears over the nose. But uniformity of colour is not to be expected in those mountain breeds of animals where the sexual intercourse is altogether unrestricted, and the animals copulate at random. The animal here shown was not a pure Welsh horse, but showed a mixture with some lowland animal of a small kind. The general symmetry was not of the character of Welsh ponies, the best of which are the most handsome of all horses in miniature.

The winner of the prize for mares and foals went to a heavy animal, with a width and depth of carcase almost unequalled. The head was large and heavy, with much white on the face, shoulder low and thick, barrel deep and flat, the legs round and groggy. The neck was short and flat, and low in the withers. The short rib very flat, and the hocks very flatly rounded. Having agreed with the judges in every award of the horses, our opinion differs on such forms as this animal being selected for breeding, as perpetuating the long exploded heavy carcases for the purpose of quick and active muscular exertion. This case bears most directly upon the point—the head of the mare was half as large again as one of the proper symmetry. The girth was also lean, which shows a want of room for the necessary bulk of lungs, and their consequent action.

The Suffolk mare of Prize 2 showed a symmetrical form, very far superior to the last-mentioned animal of the first prize. The stretching length of body pleased us much, as denoting a muscular activity, and joined with a lengthy neck constitutes a good form of the draught horse. The head was large, jawbone being broad and rather deformed. The shoulder was not of great depth, nor was the neck well crested; but all other parts were unexceptionable, and our award would reverse that of the judges, and give this mare the first prize, and that on the score of general merits.

The prize for mare ponies was joined with that of stallion ponies, the winner being a thorough black mare, showing little or no Welsh blood. Both prizes have been produced by lowland mixtures, and did not all represent the merit of the Welsh animals of the hills. But the judgment may not have been restricted to the special breed, though it would have much pleased the Welsh mountaineers to have been so.

The first prize of two-year old fillies rested with a Suffolk of no great merit; certainly a most faulty award to a very short neck, a head as long as the neck, flat ribs, and very hairy legs. But the animal showed much power in a lengthy carcase, high shoulders, and great strength of leg in bone, if not of muscle.

The shoulder and seat of the collar were almost upright, and totally deficient in the oblique taper to the withers. This short statement quite suffices for such an animal.

The second prize was given to an animal of very similar merits, neither of them possessing scarcely any two points of excellence. The colour of this second filly was good, viz., a bay coloured body with black legs, which when well defined constitutes the most handsome and fashionable of any colour of horses. Here the bay was light and sandy, and wanted the bloodredness; and the black of the legs was mixed with whitish hairs, which spoiled the character. The neck was uncommonly short, and the head as long as that part of the body. The wither was higher than in the first prize, but the shoulder was equally heavy, and the carcase lumbering. These two specimens were the worst in the show of prize horses.

The Suffolk stallions far surpassed the animals of former shows, being lighter in the carcase, more lengthy in the body, longer in the neck, and more sprightly in their appearance. The superiority to their other exhibitions could not be disputed, and the general merit of the horses has obtained a very large confirmation. A smaller head and cleaner legs are much to be desired, even in the opinion of the owners themselves; and along with a larger neck and a lighter belly, would go far to establish a breed of horses unequalled in Britain. The foundation is good on which to build, and the beginning has been made in a very considerable advancement beyond the former exhibitions. The uniform colour forms a large commendation, and also the general form of body.

With some two or three exceptions, the unsuccessful exhibition of stallions formed a group of animals of a very mediocre description, almost beyond any show that comes to our recollection. Heavy, lumbering carcases, thick legs, stiffly upright, with a largely intermixed variety of colours, showed the very different opinions entertained on this point; and much prejudice, conceit, and ignorance must have concurred with the owners of the horses, ere the inducement was obtained to submit to the public gaze such unpolished specimens of the horse—by far the noblest animal that treads the earth. Our own opinion is never able to depart from muscular power and action for the purposes of exertion; no short, heavy fat carcase, like a pig, ever could obtain our approbation for a draught horse. The phrase of "throwing weight into the collar" has been heard from the veterinary school of anatomy; but weight must be put into action by some motive power, and such a strength as is able to support the required exertion. This power in the horse is muscle, with bone, which it is able to lift with ease and freedom as a lever; with the flesh, or muscle, sufficient to fulfil its purpose of connecting the different parts of the body, and hold them together; but not in an abundance, to form a load for the muscular power. Such are our ideas, which are always freely expressed on every proper occasion. We think general opinion is now tending this way; it has long thus prevailed all over North Britain, where horses are more usefully adapted for active purposes. Our pleasure was very considerable to see the Suffolk horses improved in this respect; and, with the foundation that exists, something like perfection may be expected.

SHORTHORNS.

The shorthorn bull of this year was the property of Lord Berners, of Leicestershire; one of the new winners this department. The animal was coloured in a strawberry roan, with large white spots; and possessed a very superior merit—at least in the show of this year. The head was rather large on the side view, but in front the width betwixt the eyes was very becoming, and the muzzle well tapered. The shoulder was rather narrow on the top, with a rise on the commencement of the back; the flat top width betwixt the hock bones was very superior, and the root of the tail was well set, though rather high. The thighs were deep and wide, as is usual with the shorthorn breed, and fleshy nearly to the hock. The flank was hollow and lean where joining the hind leg, and the short-ribs were widely home. The animal was very respectable, though only a second-rate bull of that celebrated breed where the foremost specimens appear. The horn and tail showed a hardy constitution, these extreme parts denoting a proper degree of refinement of organization as much as any others. This animal was purchased at a long figure by Messrs. James Ganley and Sons, of Usher Quay, Dublin, for the Hon. Mr. Harmon, of the County of Longford, Ireland.

The second shorthorn prize, which took the first at the late Plymouth meeting, was a less animal than the first, and with nearly equal qualities. The colour was lighter, with more white in the roan. The head was faulty in a protuberant face, which is as objectionable as the concave formation. A large hollow appeared behind the shoulder, which makes a lean girth, as often happens with that breed. The inferiority was most evident by the first prize, and no mistake could be perceived in the judgment awarded.

The first prize of Class 2 went to a purely white animal of most regular symmetry of carcase, but a head much deformed by a protuberant face, and a high osseous cap of the forehead. The horns were long and irregularly set, one being lower than the other; the ear long and agile, and the eye quick. The posterior width showed well, and the touch of the skin felt very soft and gelatinous. The back was straight, and flat to a nicety; the top of the shoulder round and well covered. White animals may be delicate in constitution, but the skin is generally fine and the touch silky. With the exception of the head, this animal was not equalled in the show yard.

The second prize was won by a young bull of a beautiful strawberry-roan colour, and the most exquisite symmetry. Accident had broken off one horn, but that pendicle in the one remaining showed a clean growth and a proper bulk, which always denotes a vigour of constitution. This animal showed properties of a very superior degree, and, along with the first prize of this class, very much excelled the two prizes of Class 1.

The first prize cow was a very superior specimen of

the breed, and equal to any animal that has ever appeared at the shows of the Society. The horns were not handsome, being confined close to the head downwards; but the thin neck showed a milker, and the body the fattening properties. The width of hock bones was very rare.

The second prize well supported the reputation of Mr. Booth. The cow-like head, horn, and neck, have probably never been surpassed, along with a carcase that exhibited every propensity for the butcher. There is a probability that the latter purpose is more answered than the dairy in both these specimens, but in general merit they are unrivalled.

The two prizes for heifers went to Mr. Booth, who showed two animals perhaps never surpassed by any beasts of the kind. It would be difficult to distinguish any difference in the respective merits, except that the first prize, being lower on the leg, showed more width and a greater weight of carcase for its height. The second would please the dairy farmer, and the first the grazier and butcher.

The first prize of yearling heifers lighted upon a very handsome animal, nearly white in colour, with roan in the fore-quarters. This beast formed one of the best specimens of the show, possessing every quality that could be wished at its early age; the head being very cow-like, and the body straight, cylindrical, deep, and wide.

The winner of the second prize was wholly white in colour, with much symmetry of carcase and general appearance. These two animals fully upheld the character of their breed.

With the exception of Mr. Booth's animals, the Short-horn cattle were shown with an inferiority, though with some very fair specimens among the unsuccessful competitors. An over-refinement may attend Mr. Booth's beasts, which may be pushed beyond fecundity and the milking property; but they have always been famous for carrying much flesh on a small quantity of bone. The show of this year has been largely indebted to him; as well as to Mr. H. Smith, who exhibited a very neat animal of Sir Charles Tempest's herd, she had most of the points distinguishing a well-bred short-horn, and deservedly took the first prize for cows.

The bull of the foremost prize was an animal of much merit, and quite equal to the first place of a second-rate quality. The stature was low, with a broad compact body, showing much hardihood with a sprightly appearance of activity. These properties go far to compensate the wants of the very superior qualities.

THE HEREFORD

Cattle were represented in the first prize by a bull of Lord Berwick's, who is known as a winner for fat cattle. The present case showed an animal of very superior merit—probably the best beast in the show-yard. The variety was the New Hereford with white face, legs, and belly, with the top of the shoulder and the end of the tail. The width and depth of carcase, with the length of body, were very superior, and the animal showed an activity that does not always attend such heavy carcases. No more superior animal of the breed has ever come under our notice. The shoulder was uncommonly well covered, which produces an uniformity of shape along the whole frame. It is a point of great importance, and the Hereford beasts excel in it. A sloping shoulder joining the neck and ribs, admits the covering of flesh, and removes the heavy objection of bare bones. The present animal was well provided in this point.

The second prize went to a smaller animal, which showed a very general symmetry of form, but no very peculiar points. But the justice of the award could not be challenged.

The first prize of Class 2 went to a small animal, but of a very great merit. The general symmetry was probably superior to the others mentioned.

The second prize was won by an animal of similar merit with the above, with a horn perhaps too large for the body. The head was unusually handsome.

The cows showed uncommonly well, especially in the first prize, which has been seldom equalled. The fattened condition might be objected to in a lean animal. The other prizes of this breed were equally distinguished.

The Hereford cattle were largely and richly exhibited at this show: the contiguity of the native county to the place of exhibition favoured the convenience of transit, and it was extensively used. No superior animal to the bull of the foremost prize has ever been presented to our view, and we believe general opinion supported our judgment on that point. The palm of merit between the Hereford and shorthorn cattle may never be settled; but the former are superior in the fore-quarter, or in the shoulder and first ribs. The slanting shoulder slopes into the neck and ribs, and has not the bony projection of the shorthorn, producing much bare bone, and a great weight of useless formations. This superiority cannot be, and, we believe, is not generally, disputed: the shorthorns show a heavy coarseness in the fore-quarter, with much leathery skin from the shoulder and neck. The very best breeders have not been able to banish this property from their herds, along with a lean girth joining the shoulder and first ribs. Eight out of ten shorthorn bulls inherit this defect. On the other side, no animals of any kind exhibit such an ample development of the hind-quarter,—the deep and fleshy thigh, wide twist, and length of cut in the rump. This superiority advances to the forepart of the middle ribs, and there ceases, and other animals take the lead. This superiority was never more conspicuous than in the Hereford first prize bull of this year.

The Devon cattle excelled in two bulls, which well supported the reputation of the breeders. The first prize was the smaller beast, but probably unequalled even in the symmetry of the handsomest of all breeds of British cattle. The straight carcase from the shoulder to the rump, along the back and both sides, formed a point of pre-eminence not at all equalled in the show-yard, and probably never surpassed by animals of the Devon breed. No cattle in Britain exhibit the same squareness of carcase as the Devon; especially along the sides, from the point of the shoulder to the extremity of the mid-thigh. This breed, and the Hereford, lose the

posterior width behind the hook-bones, which the short-horns maintain, and even expand; but in the fore-quarters, in the covered shoulder, and fulness of girth, the Devon probably exceeds the Hereford—at least the equality is fully supported. If the Devon were one quarter heavier, and the horn reduced in one-half the length, the appearance in worth might be improved, although not very materially advanced. As with the Suffolk horses, the uniformity of colour much recommends the Devon cattle; the character is throughout equally uniform, and the symmetry is unequalled by any cattle in Britain; and the general and most entire character has never been more fully upheld than by the two bulls now mentioned.

The protuberant buttock of the Devon and Hereford beasts forms a defect in comparison with the upright standing of the shorthorn, confirming the former observations on the respective merits of the different breeds.

The cows and heifers of the Devon breed at this show supported the usual character—small in appearance, but capable of yielding a larger progeny than is indicated by the size of carcase. The yearling heifers of this show were most exquisitely handsome.

WELSH CATTLE

appeared in fair specimens of the mixed Pembroke colour, the mountain dingy black, and the lowland white, but no peculiar merit was shown by any of them.

OTHER BREEDS

were not large in number, and smaller in merit. A red polled bull was an exception; but even that beast was little regarded.

SHEEP

were chiefly exhibited by Messrs. Sanday and Webb; the latter so well known among Down sheep breeders, and the former gentleman for producing the finest specimens of the small variety of Leicester sheep, with the wool of curly pile. The fore flank, in the very large fulness, is most remarkable in these sheep, with the fineness of bone and compactness of carcase; but a delicacy is apparent, though the great merit is undeniable. The head scarcely tapers in a corresponding fineness with the body. The bare top of the head in wool and skin shows the overwrought refinement of the animal. The prize ewes were of the same description, being small in our opinion both in flesh and wool.

The excellence of the Down sheep in Messrs. Webb and Rigden's needs no commendation. The ewes of Mr. Lugar showed a strong advance to rivalry.

LONG-WOOLLED SHEEP

were numerously exhibited, the show being placed in the native country of these animals. Judges allowed great merit to them, and certainly they were superior to any former show.

SPECIAL PRIZES

were very well won by Mr. Foster, who also received commendation for his Shropshire Down sheep. The larger specimen seemed a most useful animal for breeding and fattening.

The Messrs. Ganly, of Dublin, whom we stated elsewhere purchased Lord Bernard's short-horned bull, also purchased several of the first class short and long-woolled rams for noblemen and gentlemen in Ireland.

PIGS

were well represented in the large breeds, and exhibited much merit. The two prize boars of this class were superior to any recollection of the animals at former shows, being long in the carcase, of proper length of leg, and activity of body. The large boars and sows were white in colour, while the prizes of the small breeds went to black animals, the white pigs of the small breed being few in number and in merit. The white colour may be preferable in pigs, as the flesh is dressed for use with the skin unremoved, and a whiteness is more agreeable on the table than blackness of any kind. The swine of the small breeds have been better exhibited than in the show of this year. A new breed might be produced with advantage in the midway between the large and small breeds that now exist, and one to serve both purposes of bacon and fresh pork, according to age and time of being used.

THE POULTRY

formed a very great attraction to the visitors of the yard. The Dorking fowls were numerous, and splendid in the quality, as was the unanimous opinion of every inspector. Two tiers of cages, extending along the whole side of the enclosed yard, very deservedly engaged much attention. It may be difficult, probably impossible, to foretell the result of the acclimation in Britain of the Cochin China fowls; but to judge from appearances, when placed alongside the Dorking poultry, the competition will meet with a strong contention, as present judgment would decide for the Dorkings. The second prize of these fowls showed a most splendid specimen of the breed.

The game fowls in the red and white varieties were well exhibited. The proud strut, majestic mien, and piercing eye of these cock birds are very attractive and pleasing to behold, and in some respects are superior to the Dorking—more prolific in eggs and chickens, though less in bulk of flesh.

THE POLAND FOWLS

were well shown, with the black body, and white crown over the head. The general character does not reach the two former breeds; nor do the Malays nor Hamburgh fowls.

TURKEYS

were splendid—specimens from Lord Hill and Mr. Fairlie. We have never seen that forest tenant of the western world so richly coloured with silvery feathers, or so proud in the majestic strut, as in the prize specimens of the above-mentioned nobleman. They were much and justly admired.

DUCKS,

purely white in colour, were in a beautiful specimen of Mr. M. Rowe, Devonshire. Their long square body and tapering bill showed them to be of very superior appearance. A second prize was given them. The progeny may reach the first place in future exhibitions.

GEESE

were numerous, and superior in quality. Our preference

was given to the third prize, being wholly white in colour. They suited our notions, that as the flesh is prepared with the skin unremoved, the white colour is the most pleasing, as just mentioned in the case of black and white swine. It may infer a delicacy of constitution as with white horses and cattle; but the defect, if any, is not much felt, and the purposes are different. Our idea may be an unfounded partiality on this point, but the justness has been admitted.

THE DINNER IN THE PAVILION.

On WEDNESDAY the annual dinner of the members of the society took place in the now well-known Pavilion which does duty yearly at these popular festivals, and which was erected for the occasion in the beautiful grounds immediately adjacent to the Spa Gardens. Upwards of 800 gentlemen were present, the chair being filled by the President of the Society, Lord Ashburton, who was supported by the Mayor of Gloucester, Earl Beauchamp, Lord Berners, the Hon. J. C. Ingersoll (the American Minister), the Earl of Harrowby, and Judge Halliburton. At the principal tables we also observed the Earl of Powis, Lord Bridport, the Hon. Keppel Coke Viscount Hereford, Sir Roderick Murchison, General Arista (ex-President of the Republic of Mexico), Mr. Slaney, Mr. Foley, M.P., Col. Rushout, M.P., Mr. Portman, M.P., Sir W. Codrington, M.P. And amongst the general company were Colonel Challoner, Sir M. W. Ridley, Mr. Dudley Seymour, M.P., Sir J. Shelly, M.P., Sir Lionel Darell, Sir H. M. Vavasour, Sir T. D. Acland, M.P., Sir Joseph Bailey, Mr. Blount, M.P., Mr. Hampden Turner, Mr. Alcock, M.P., Mr. Hippesley, M.P., Mr. Ricardo, M.P., Mr. Cobbold, M.P., Hon. S. Salisbury, Mr. Jas. Macgregor, M.P., Mr. Bramston, M.P., Sir Digby Neave, Dr. Jeune (head master of Pembroke College, Oxford), Mr. Clifford, M.P., Mr. Gordon Cumming, Hon. G. C. Agar, Professors Simonds, Johnston, and Way, Mr. George Turner, Mr. S. Jonas, Capt. Nigel F. Kingscote, M.P., Mr. W. P. Price, M.P., Mr. R. B. Hale, M.P, Mr. J. R. Mullings, M.P., the High Sheriff of the County (Raymond Barker, Esq.), T. Gambier Parry, Esq., J. Curtis Hayward, Esq., S. Baker, Esq., J. Ackers, Esq., E. Holland, Esq, W. Dent, Esq., P. B. Purnell, Esq., E. Hopkinson, Esq., D. J. Niblett, Esq., Rev. Mr. Witts, F. Woodward, Esq., — Leighton, Esq., Mr. H. Turner, and, indeed, a majority of the most eminent agriculturists in the kingdom. In the absence of Mr. Pusey, the President elect for the coming year, who was unfortunately prevented attending by illness, the vice-chair was filled by the Hon. Robert Clive, M.P.

Grace having been said,

The CHAIRMAN rose and said: Gentlemen, we have thanked God for the spread set before us—we thank Him also that He has set over us a Sovereign that cares for her people, whilst her people care for and love and bless her. And now, in this hour of our festivity, when we are met together to celebrate the triumphs of this Society, let our first duty be to pay her homage, and to express our wishes for her prosperity and welfare. I give you "The Queen" (loud cheers, followed by three times three, and one cheer more).

The next toast was "The Health of Prince Albert, the Prince of Wales, and the rest of the Royal Family."

The CHAIRMAN again rose, and said: I now call upon you to fulfil the pleasing duties of hospitality. I call upon you to drink the health of the Minister of a state, foreign from us indeed in name and in policy, but connected with us by the dearest ties of blood and of sympathy (loud cheers). That gentleman has not thought it unworthy of his high station to come amongst us and join in the celebration of this our festival. We thank him for his presence. We accept it as a token of his regard, and of the regard also of the people whom he represents—a regard which we value above that of any other nation that inhabits the globe (great cheering). I give you "The Health of Mr. Ingersoll, the Minister of the United States," and I beg you will tender him a right English welcome.

The toast was drunk amidst enthusiastic and protracted cheers, which were renewed with increased vehemence when the hon. gentleman rose to return thanks.

Mr. INGERSOLL said: My Lord Ashburton and gentlemen, surrounded as I am by so much that is eminent and excellent, I cannot but deeply feel and appreciate the compliment that has been paid to my country through its very humble representative now before you. I feel particularly gratified that upon this occasion I have the honour to meet, as the President of this great association, the distinguished nobleman who is presiding here to-day (Hear, hear). I know his many virtues. They are, personally, derived in direct lineage—they are, officially, the result of a merited selection (loud cheers). I remember very well that when the father of that excellent nobleman came to our country, he was hailed with joy as the minister of goodwill, and the harbinger, I trust, of perpetual friendship between the two countries (prolonged cheering). I have often heard that he entered upon his special mission with a determination to renounce the ordinary intricacies, and certainly all the subtleties of diplomacy, and to reach directly, if it were possible, results that should be beneficial to each country, with the natural partiality that he felt for his own, but with the justice that he felt was due to that with which he was negociating (Hear, hear). The consequence was that a delicate point was settled speedily—a point of peculiar delicacy between two conterminous countries, where a boundary line was to be established which might, perhaps, throw out of their ordinary and established allegiance many individuals, and induce them in a degree that might be unwonted, and therefore unwelcome, to accept of an allegiance that might be new to them (Hear). The circumstance of its resulting in what appeared to be satisfaction on all sides, has, however, been felt from that hour to this. It indicates how wisely and how well the negociations were conducted, and has set an example which, from that day to this, I think has been followed in both countries, by a desire to cultivate that good will and those sentiments of friendship of which the foundation was newly laid at the period to which I refer (cheers). Turning from these recollections, I cannot but bring to the consideration of this great assembly that which is of course to-day most prominent in their minds. I mean that system which is in itself a bond of union between the two countries, certainly as prominent, and perhaps as powerful, as any other that can possibly exist. Agriculture is not only the most ancient, but the most honourable and the most useful employment of our race (cheers). Agriculture in many of its productions is especially the bond of union between your country and mine (renewed cheers). A portion of the agricultural productions of America—perhaps one of the heaviest and largest of those productions that go abroad—cotton, is, if I may use the phrase, without anything like an error in point of figures of rhetoric, the daily bread of the manufacturers of Great Britain (Hear, hear). We send you, at this moment, millions of bales of cotton, which go to your manufacturers, who return that cotton in a new shape to our country, to clothe us to a very great extent, as it has clothed and pros-

pered you. Perhaps it would not be going too far to ascribe in part the present prosperity of England, and certainly that part of it which is engaged in manufactures, to the employment that is given in your manufacturing towns by the cotton of the United States; and you may rely upon it, that if you desire more—if your appetite should grow with that it feeds upon, we shall continue to produce more and more, in order to supply your desires, and still go on to cultivate the friendship that such an intercourse is calculated to promote (Hear, hear). In passing, I may remark that there is no great danger, at least for a century or two to come, of a too-large demand for this article on your part; and I trust there is no danger of a diminution in the supply on ours, notwithstanding that cotton is produced in Egypt, in India, and, in fact, I believe, in Western Africa (Hear, hear). I have lately received intelligence from Alexandria that the export of cotton last year from Egypt amounted to 500,000 bales—an immense amount, truly; but the quantity grown annually in America is about 3,000,000 of bales at this moment; and it is computed that by the year 1860 another 1,000,000 of bales will be added to that—thus making the total produce amount to 4,000,000 of bales. It is said, however, that in Egypt the cotton-growing land is already occupied, and that the land of the Pharaohs and the Ptolemies will not interfere with the lands of the Washingtons in the production of the cotton which is required by this country (cheers). But let me add that we have various other commodities, besides this leading one of cotton, which we are happy to share with you, and by means of which we may cultivate those feelings of interest that are so closely allied to the feelings of friendship, and sometimes lie at the very root of them. There is an agricultural production, perhaps not so useful as cotton, yet abundantly used in this country as well as ours—a commodity which contributes to fill your warehouses, and notwithstanding late arrangements which have been much rejoiced at throughout the country, contributing also to fill your exchequer—I mean tobacco—(Hear, hear, and laughter). Tobacco is a commodity that we grow to the extent of 200 millions of pounds per annum. I know not to what extent you take it; but I do not believe it to be an article that is exactly either food or raiment (Hear, and laughter). Again, whenever a wet season or an unpropitious moment of any kind renders it desirable that you should call upon us for our edibles, we will promise to cultivate and supply them to any extent that you may desire (cheers). Rice, which is an article of food to one-third of the whole human family, is produced amongst us to the extent of 200,000,000lbs. annually. Wheat we produce to the extent of 100,000,000 bushels. And, above all, there is an edible which has not been much introduced among you here, but which your sister kingdom of Ireland, during the famine of 1848, received largely from us—I mean maize, or Indian corn, which is produced among us to the extent of 600,000,000 bushels annually (cheers). Do not suppose that I indulge in vain boastings when thus talking of the hundreds and thousands of millions of bushels and pounds which we produce of these articles. With the vast extent of territory, and the variety of soil and climate which we possess where everything convenient for the use of man is found in one place if not in another, Nature would cry "shame" upon her sons if we did not produce largely (cheers). It has been computed, I believe, that there are about 46,000,000 acres of land in England and Wales; but there are in the United States, of public lands which belong to the government, ready for sale and appropriation at the smallest possible price to individuals who may be willing to take them, not less than 1,370,000,000 of acres. And I would say to this great company, that if it should at any time happen that your crops are not abundant, or that the prediction of a distinguished political philosopher 150 years ago, Joshua Gee, should in any respect be verified, namely, that England could not contain ten millions of inhabitants—she having now long since doubled that amount—if, I say, you should ever find your population pressing upon the soil, then in great humility of spirit, but with the most hospitable feeling, I invite you to come over to us, and to stay with us as long as you please; you shall be received with a most hearty welcome (loud cheers and laughter). Observe, this is a move which has already, in some degree, been looked upon with a favourable eye. I believe it is estimated that there are now on the soil of the United States upwards of a million of friends from Ireland, and a quarter of a million of friends from England, settled and resident there. And recollect that our constitution and our laws are such—I throw it out for the information of those who are not aware of the fact—that every individual who chooses to come amongst us, whose conduct and whose character are untainted, may attain nearly every political distinction, and certainly attain every social right (cheers). But it is not alone on account of its direct effects that I have thus briefly called your attention to the importance of agriculture; it is also the great source of the extensive shipping that carries on the commerce of the world. These immense store-houses which float over the ocean in all its parts are either the produce of our primeval forests, or the results of those forests when cultivated by the science of agriculture. And now that we see them bridging the ocean, as it were, between your country and ours, rendering the voyage so short that no one thinks it worth while to hesitate in the performance of it, and so agreeable that everybody must enjoy it, we should not forget that for all this we are originally indebted to agriculture (cheers). One word more as to my country. There, where such an abundance of soil is to be found, science has also in a degree been introduced into agriculture, and, though not to the extent it prevails among you, yet with us too the pursuit of it amounts to a passion, and by far the largest part of our population are engaged in it. In that country, and with that population, we shall be delighted at all times, as heretofore, to emulate the science and the art of the country by whose citizens I am at this moment surrounded—a country which stands at the head of the agriculture of the world (cheers). I beg to give you as a toast "The Royal Agricultural Society of England" (protracted cheering, followed by three times three).

Sir M. W. RIDLEY said it had very unfortunately fallen to his lot to propose the health of their excellent President (loud cheers). In addition to the peculiar local services of the day they must all appreciate the services of a gentleman who had fulfilled the duties of the difficult situation which had been placed before him that day; but at the same time he might add, they were duties to which he had been accustomed. He could not conclude without observing on the pleasure which it afforded him to meet their friends of the Royal Agricultural Society on this occasion in the ancient city of Gloucester. He need say no more than recommend to their notice the toast which he was about to propose. He begged to give them the "Health of their most excellent President, Lord Ashburton" (loud cheers).

Lord ASHBURTON, in reply, said: I feel proud of having my name connected, even for a day, with a society which has done so much for agriculture—so much for England. Other societies have risen before, to beg or to extort assistance from the authorities of the day. They have passed away with the occasion that gave them birth, without leaving a trace of their existence. This society has been founded upon the principle that God helps those that help themselves (cheers). We have

left governments to do their best or to do their worst. In spite of heavy blows and sore discouragement, we have kept our shoulders manfully to the wheel; and God has so blessed our efforts that now, at this time, if you were to ask any one of the distinguished foreigners that honour England with their presence, what produce of British industry is most unquestionably superior to the produce of the rest of the world—what is the produce of Great Britain which gives him the highest idea of the judgment, ingenuity, and practical skill of Englishmen, he would tell you that he has seen better silks in France, more beautiful cottons in Switzerland; that we are losing ground in edge-tools and cutlery; that America equals us in ship-building; but that there is one kind of British produce the excellence of which no other country can approach—one kind that men flock from all countries to see and admire, and purchase at fabulous prices—and that produce is the produce of the British farmer (loud cheers). He would tell you further, that while Manchester, and Spitalfields, and Stoke-upon-Trent, and other hives of industry, are wont to call in French and Germans, to assist, direct, and instruct them in the higher branches of their several arts, the world comes to us to learn farming (cheers). But I am not satisfied with merely claiming the palm for our produce. I venture to assert that the farmer has far greater difficulties to contend with in his calling than any other producer—that his contest with those difficulties employs, cultivates, and developes more energy, more courage, more resource, more practical wisdom, than is created by any other industrial pursuit (cheers). Take, for example, the case of the cotton-spinner; he buys his machine, and puts his cotton in at one end to take the finished article out at the other; he undergoes no risk, he feels no anxiety. He deals, indeed, with the powers of nature, but with powers delivered into his hand, controlled, mastered, and domesticated by his machinery. The farmer also deals with nature, but with nature in her wildest and most wayward moods; he has to encounter her in the tempest, in the burning drought, in the overwhelming flood, in the plague of insects (Hear). The qualities required of him are those of one who navigates his vessel amidst the storms of the Atlantic; the qualities required of the other are rather those of the captain of a barge towed upon your peaceful canal (cheers and laughter). The consequence is that the farmer of the present day is no more like the farmer of yore than the steam-ship that forces its regular passage in spite of wind and current is like the tub-shaped galliot of old, that lay-to in every head wind, and made one voyage a-year. Like the steamer, you have learned almost to defy the vicissitudes of the elements. It is true you cannot stop the deluge of rain, but you drain off superfluous moisture; you cannot prevent drought, but you give such a crumb to the surface of the soil by your implements, such a strength to the crop by your manures, as to defy it; you cannot arrest the plague of insects, but you hurry the growth of the turnip by artificial means, and raise it out of their reach; you have invented breeds of beasts and sheep to make beef in 20 months, mutton in 15; you have called the steam-engine in to do your work; in short, you have raised agriculture from being a mere empirical pursuit to become a master science, a dominant art, rallying under its guidance, in subordinate co-operation, the labours of the chemist, the physiologist, and mechanician (loud cheers). The result is, that we farmers of England, thwarted by nature as no other industry is thwarted, smarting under sore discouragement experienced at the hand of man, have by our skill and perseverance elevated our calling to the highest rank of industrial pursuits, and have done more to illustrate the skill and ingenuity of England than any other profession—that we who have made great and generous sacrifices to the public good, have made more progress than even those on whose behalf those sacrifices were made (cheers). Now, gentlemen, why do I insist upon this? It is not to flatter those entitled to this praise. It is to stimulate the backward, to shame those who still cling to the antiquated practices of their forefathers—who, in the midst of light, still live in darkness. What is to be the doom of those who, with our show stock before their eyes, go on rearing bony scrags of beasts that no feeding can fatten—who, with our prize implements before their eyes, do that still by hand which they could do cheaper and better by machinery—who allow the runnings from their fields to wash the goodness out of their yard into the pond that gives drink to their cattle—whose horses are half-fed, whose fields are undrained, whose crops are unhoed, who reap as much weed as wheat (Hear)? Depend upon it, the days of those men are numbered (loud cries of "Hear, hear"); they are condemned, not by the law of man, but by the law of God—by that law which he has made to regulate the growth of all that has life—by that law which speaks out to them in their fields and in their woods—that the plant which stops in its growth is first hovered, then stifled (cheers). The lagging farmer can no more hope to be exempted from this doom than he can hope at his will to add a cubit to his stature (cheers). I fear, gentlemen, that I have wearied you—(No, no!)—but allow me, before I close, to address a parting word to the landowners. They also must perform their part (loud cheers). If they do not wish to see their lands desolate, they must put up suitable buildings for their improving tenants; but, above all, they must prepare betimes to meet that great, that happy change, which is taking place in the relations between the labourer and his employers—a change which I have earnestly wished for—a change which I thank God I have been permitted to see—(cheers)—for it will raise him from serfdom to the independence of a free man: it will awaken into a new life of energy and usefulness that sluggish indifference into which his hitherto degraded position has cast him; he will henceforth be a better workman, better parent, better citizen (cheers). This only was wanting to fill up the measure of blessings which Providence has showered over our country; but, then, we landlords must be prepared to meet this new emergency. It is no longer our business to seek by emigration to keep down numbers within the limits of employment; it is now our pleasing care to retain the energetic, the active, the industrious, by increasing comforts, by improved cottages close to their work (cheers). So alone can we render the homes of their forefathers more attractive to the labourer than the gold-fields of Australia, or the increasing wages of the manufacturing districts. But I will no longer linger upon this grateful subject, which will be far better treated by my noble friend, who will give you the toast of "The Labourers." Permit me to thank you for the kind attention with which you have heard me, and to drink to your health and welfare. (The noble lord resumed his seat amidst loud and prolonged cheers.)

Col. CHALLONER then proceeded to give the next toast of "Agriculture, Manufactures, and Commerce." He observed that they were three sisters, and so closely linked together, that an injury to one was acutely felt by all the others. He pointed to the increasing trade of Gloucester as an example of how commerce was flourishing; to the prevalence of machinery, and the immense benefits conferred by the cotton manufactures and others on the country, as an evidence of its deserts; and to the present meeting, as an imperishable monument of the agricultural effort of the age. He also mentioned the intimate connection between agriculture and manufactures, as evinced by the machinery that had been exhibited before them in a more improved form than perhaps on any previous occasion.

Lord BERNERS said that it devolved on him to propose the next toast, and it was one that he was sure would meet with their greatest approbation—that of "The Authorities of the City of Gloucester." Everything that could have been done for the convenience of the Society had been done by the local authorities; and it was by the kind hospitality of the Mayor that the Council had been entertained at the Guildhall. It was a great satisfaction to the farmers of England to see all classes of society prospering, as they were well aware that, unless the other classes prospered, the farmers would not.

Thanking the Mayor and the authorities for the kind reception they had met with, and the great exertions they had made to forward the operations of the Society during the meeting, he begged to propose the good health of that august body.

The MAYOR, on rising, was received with loud cheers. He observed that he rose with every sentiment of respect and gratitude to acknowledge the distinguished compliment they had been pleased to pay the Corporation of Gloucester, over which he had the honour to preside; and it was a great gratification to him to assure that large and influential assembly of the deep feeling his fellow-citizens entertained of the honour that had been conferred upon them by the Royal Agricultural Society of England by their visit to the ancient and "fair" city of Gloucester (cheers). After observing upon the progressive spirit of the age, he remarked that they were bound to take advantage of all the great discoveries that were constantly taking place around them in science and in art, and practically to apply those discoveries to the industrial pursuits in which they were all engaged. The agriculturists of England had been fully sensible of this necessity, and they had wisely associated themselves together in order to exchange their sentiments and opinions; to give to each other an account of their discoveries; to compare the result of their experience; to observe the beautiful operations of mechanical art which had that day been presented to their observation; and to notice also the still more interesting display of animal life that would claim their attention on the morrow. Let it not be supposed that these things concerned only those who were engaged in the cultivation of the soil; the same principle applied to all classes, in these stirring times, when the progress of society had been so rapid—when the world was on the tip-toe of expectation as to what events might next occur. Not only the manufacturer and the merchant, but the agriculturist must look abroad. He must move with the signs of the times, or he would be left behind in the march of competition. He considered, therefore, that this society assumed a national importance, and was one which all classes should support, in which all classes should feel a deep interest, and one in the success of which all classes should rejoice. He was gratified to find that his fellow-citizens, although generally engaged in commerce, had entered fully into these feelings, and had used their best exertions to give a right hearty welcome to the Royal Agricultural Society (cheers). They, he could assure them, felt a deep interest in the success of that society, and nothing would be more gratifying to them, and no higher reward did they ask for any labour which they had bestowed, than to find that it had received the satisfaction of those who had honoured them with their company upon this occasion, and also to be assured that their most sanguine anticipations had been realized, and that the Gloucester meeting was regarded as one of the most successful in the annals of the society (cheers). It only remained to him to thank them most gratefully and sincerely for the kind and distinguished honour they had conferred on the city of Gloucester.

The Mayor resumed his seat amidst the general applause of the meeting.

The Earl of HARROWBY, in proposing the toast of "The Labouring Classes," which was drunk with much cheering, said that about ten or fifteen years ago a very distinguished writer on political economy expressed some doubts as to the advantage of improvement in agriculture to the labouring classes; because, he argued, that by the introduction of machinery the employment of the number of hands would be diminished. But this was a very short-sighted view of the subject. The writer might have learned from the experience of the manufacturers, that although the introduction of a machine might at first displace many hands, yet the cheapness of the article, and the consequent demand for it, very soon necessitated the employment of a much greater number than before (Hear, hear). And if he had only looked to Yorkshire and Lancashire, he would have found that where the greatest amount of machinery was introduced, there was the largest amount of human labour employed. But he was not at that time so well aware of the application of this principle to agriculture; and certainly at first sight it seemed plausible enough that if a machine were introduced that could do the work of ten pair of hands, of course so many pair of hands would be thrown out of employ. The fact was, however, quite the reverse; and they all knew, if they looked at the farms upon which the greatest amount of improvement had been introduced, and the largest amount of machinery employed, that there they would find the largest amount of human labour also (Hear). The labourers were thus deeply interested in the improvement of agriculture, and he (the Earl of Harrowby) thought he might lay it down as a general rule, that in those quarters where little machinery and little drainage were introduced, and the farmers were without enterprise, there would exist a dwindling, idle, pauperised, and vicious population (Hear). But the apprehensions which once prevailed with respect to the evil effects of machinery in superseding manual labour could now no longer be entertained; because, from being a country overloaded with population, the experience of the last two or three years showed that it was possible to find ourselves all of a sudden the most deficient of population of any country in the world. The question was, then, how we were to adapt ourselves to this new condition of things; for all our enterprises and undertakings had hitherto been based upon the expectation of always finding a vast amount of labour at our doors. But now circumstances were altered. The stream of emigration was beginning to set out from our parishes, and the farmers were looking about with anxiety for the means of carrying on their operations. Surely, then, it behoved them to see if they could not devise means by which one pair of hands might do the work of two or more (Hear, hear). To enable them to do this was one of the objects of this great society, and the benefits would not be confined to the farmers alone; for labourers also would derive great advantage from its operations. There was no fear that their labours would be superseded, and the result to them would be that their labour would become of a higher order, and instead of their being employed as mere brute animals they would be employed and treated as men of cultivated understandings, competent to direct the action of the complex machinery entrusted to their care (cheers). And this led him (the Earl of Harrowby) to another subject. Let not the farmers be jealous of the education of their labourers, even though it was better than that which had been given to their own children. He believed that schools of a very high order would shortly be brought home to every man's door; that the schoolmasters provided for the education of the poor would be competent also to instruct the children of farmers; and that if the latter did not allow their offspring to share in that advantage they would have themselves alone to blame for it (Hear, hear). He was sure the labourers would not be worse servants for being educated. The peasantry of Scotland were the best educated portion of the labourers of the United Kingdom; and could it be said that they were bad agriculturists, or at all the worse for that? On the contrary, they were the most industrious people within the British dominions; and their hands were certainly not more idle or less useful because they were directed by an active and instructed head; nor the men less faithful because they spent their evenings in the lecture-room instead of in the ale-house. He believed there would be fewer hands than formerly, and that their agricultural labourers must be composed of a higher order of men—men of more cultivated minds, and better able to do their work than their predecessors (Hear, hear). They had been told by the president to-day that landlords had a duty to perform towards the labourers, and he agreed with his noble friend that the labourers ought to be better and more comfortably lodged. But it should be remembered, that, in matters concerning agriculture and the land, they could not proceed with the same rapidity as the manufacturers. Neither farmers nor landlords were men with a large amount of floating capital at their command. They were men of income only, and not of large capital; the improvements they adopted they were therefore obliged to adopt slowly. But, on looking England through, it would be seen that, although the movements of the agriculturists were not so rapid as those of the manufacturers, yet, comparing ten years with ten years, the advances which agriculturists had of late made were everywhere most strikingly apparent (cheers).

Sir RODERICK MURCHISON said that a toast had been entrusted to him, to propose which required the powers of an Atlas to do justice to it. It was "The Agricultural Societies throughout the World" (cheers and laughter). And he saw

by the list of toasts that he was honoured with a title which he did not know he possessed before. He was described there as K. S. A, which he presumed must mean Knight of the Society of Agriculture (laughter)—and that, therefore, upon this most remarkable occasion, he was to stand forward and be their knight-errant (renewed laughter and cheers). The task was doubtless a very onerous one for a plain man of science like himself to perform. But, for a long period of his life he had had the satisfaction of being connected with many societies which had for their object the diffusion of science, and among others he had taken an active part in the British Association for the Advancement of Science, out of which this glorious Agricultural Association had taken its origin. On the foundation of that society this was established, and the principles which that association could only carry out on a comparatively limited scale, amongst a few men of science, this had carried out amongst thousands of men, and diffused its beneficent influence over the world. The day was far gone by when it was necessary for any Dominie Sampson of geology, or any itinerant geologist, to go about informing the agriculturists of England of the intimate connection which existed between the soil which they cultivated and the subsoil or rocks with which he (Sir R. Murchison) dealt. They had in their body men quite capable of showing them the foundation upon which the whole thing stood; and here he must beg the noble president to observe that he had omitted the foundation on which all agriculture rested, the rocks, the geology of their science. He was delighted to see, however, that in the volumes which were published by the society, the first article of their creed in every article was the geological structure of the country, and next followed the agricultural division, and everything of course which rested upon their rocks (Hear, hear). The spread of agricultural societies founded upon the principles of their own had gone on, on the other side of the Atlantic, as they had heard from the Minister of the United States, and not only in that vast country, but in other portions of the American continent which had representatives sitting close to him. He had upon his left hand the vice-president of the republic of Mexico, General Arista (cheers). And he would tell them that he had learned from a conversation with his excellency, that he was the first person in the republic of Mexico who had founded an agricultural society upon the same principle as their own. In that land General Arista offered temptations to emigrants almost greater than those which the American Minister had pointed out to them; for he had told him (Sir R. Murchison) that the fee-simple of the utmost exuberant land in Mexico was to be bought at three-halfpence an acre (a laugh). He might also tell them that General Arista was not a man of mere words, but a man of deeds also, for he was the first person who, in the show-yard that day, had bought one of the finest of their new inventions, which he was going to take back with him to his own land. He should ask General Arista to say something in reply to the toast, but he did not speak the language of this country. He had on his right hand, however, another representative of a true Englishman (loud and prolonged cheers). He saw by their cheers that they were all very well acquainted with Sam Slick (laughter and renewed cheering). He felt that he (Sir R. Murchison) had already spoken too long (No, no)—at all events that "good wine required no bush." They would allow him to say, however, that, in addition to Sam Slick, there were other works of the gentleman to whom he had alluded, which were imbued with the highest tone of morality, and calculated to improve the social condition of man more than perhaps any other books, and among these was the last work which this eminent man had written, entitled, "Wise Saws and Modern Instances" (cheers, and a laugh). As throughout his life this man had taught them so many "wise saws" which they had implanted in their hearts, so he hoped they would allow him (Sir R. Murchison) to point him out as the best "modern instance" and exemplification in his own person of the principles which he had so ably advocated, and was still advocating (cheers). He would therefore conclude by proposing the toast respecting the agricultural societies in all corners of the world, coupling with it "The Health of the Hon. Judge Haliburton, the Author of 'Sam Slick,' and of 'Wise Saws and Modern Instances'" (cheers).

The toast having been suitably honoured,

Judge HALIBURTON, on rising to respond to the toast, was greeted with renewed applause, which lasted for some minutes. He said he felt quite overpowered at the manner in which his name had been received, and which was so unexpected that it had taken away from him the ability to express himself in the manner that his accustomed calmness would have enabled him to have done (a laugh). It was a parliamentary custom—he appealed to his noble friend the chairman to support his assertion—to give some "notice of motion"—(a laugh)—and if he had had that notice on the present occasion it was possible that he might have been prepared to be a little more calm than now, though perhaps he should not have made so natural a speech (a laugh). He had to thank his friend on his left for the very hand some manner in which he had been pleased to bring forward his name, and he was the more gratified that it had fallen to his share to do so, because *Gaudeo laudari, a te laudato viro* (cheers). He believed if there was a man who had promoted the welfare of the farmers of this country, it was their scientific friend, who had done him the honour of proposing his name to them (cheers). He was the man who, with marvellous forethought and foreknowledge, had predicted the gold of Australia. He was the man who had sent out thousands and thousands of their superfluous population to dig that gold, whilst the British farmer had to feed them (Hear). Politicians claimed to themselves the merit of all the present high prices for home produce, but factitious causes had really led to those high prices (Hear hear). Certainly, politics were not the bread of life (a laugh). During the war, when the high prices raised up the farmers of this country, it was because the unproductive classes existed in such numbers—it was because the army, and navy, and people in the public employments, had to be fed. And now, one quarter of the whole population of this country was either afloat on the water or digging at the diggings, and as they had to be fed, the unproductive class had again increased, though from an entirely different cause, and thus prices had increased. Therefore, he said, don't let the politicians take the whole credit of it to themselves (cheers). He had also to thank them for the honour they had done him in naming some of his books—books that he never could have written unless he had spent his whole life in the country—unless it were that he had never lived in towns, but among his countrymen the farmers. He loved the farmers—(Hear)—from the opulent farmers (and it took very little to make a man opulent in a poor country) down to the occupier of the log hut—and the happiest days, or rather hours, of his life he had spent in their society. It was by talking to these people, and by knowing their feelings and prejudices—for they, too, had their prejudices like other people—it was from knowing them intimately that he had acquired some little insight into that human nature which they had done him the honour of saying he had put in his books (cheers). He liked the farmers; and why? Because "God made the country, and man made the town" (cheers). Agriculture was the most simple, the most natural, the most ancient, and the most honourable employment of man; and though he could not say that he had contributed anything to the exhibition in the show-yard, in the shape of a model or anything of that kind, yet a little wooden clock he had exhibited to his own countrymen, together with some moral lessons, which he hoped had done them some good (cheers). One thing he must say, that he should be a most ungrateful man, and as vain and conceited as ungrateful, if he did not say that he was proud that his lessons had been read and approved by the farmers of England as well as by those of his own country (cheers). One of the moral lessons that had come from that simple instrument the wooden clock was the teaching of the farmers of his country the value of time, which they were all too apt to forget: it taught him the hours of work and of recreation, and how to get an extra hour for an extra dollar if he wanted it. But, like the human machine, it had one great defect which ought not to be copied—it "went on tick" (roars of laughter). He had not the honour to be an Englishman, but was a native of a distant part of the world. A hundred and fifty years had now elapsed since his forefathers left this country. Whether they slipped off at the assizes (loud laughter, in which the learned judge heartily joined)—whether they slipped off at the assizes, or were sent out by one of his own cloth at the public expense, there was nobody now old enough to say (renewed laughter), and therefore it would be perhaps as well that they should not make too strict an inquiry into that matter (laughter). It was a long exile, though (renewed laughter). His excellent friend the American Minister had talked about that country being ready to receive the surplus population of England; but

he (Judge Haliburton) should like to emigrate back to England again (laughter). It would be his delight and his happiness to return to England; and he was not sure that if one of his learned brethren would transport him here, that he would not commit some crime, provided there was no moral guilt attached to it (laughter). But, turning to the object which had led to their assembling there that day, he assured them that he had never spent two such delightful days in his life as that and the previous one, which he had devoted to the witnessing of their exhibition (loud applause). As a practical farmer himself—one who had engaged in, and was fond of, the cultivation of the soil—he had come from the north, from Scotland, for the purpose of being present at the exhibition to witness the improvements that had taken place in agriculture during the last ten years. He had observed everywhere, and it gave him great pleasure that without the least flattery he could say so, that within the last ten years since he was last in this country, such an improvement had taken place as was beyond everything that could be conceived (cheers). The improvement in that class to which Lord Harrowby had referred—the lower orders—had been greater than in any other class, for they were better fed, better clothed, better paid, and respected themselves (cheers). As a traveller, perhaps they would permit him to mention an instance of this improvement. He saw in St. James's Park the other day a notice—"The public are requested to protect the gardens and trees in this place" (Hear). No notice of man-traps and spring-guns, or of prosecutions (cheers). That one fact spoke volumes. He was at Loughborough last week, and on examining some public grounds he saw a similar notice—"These grounds are for the benefit of the public, and the public are requested to protect them." That, too, was an evidence that the working classes respected themselves, and that they were worthy of the respect of their superiors; and it was a most gratifying fact that it was so (cheers). And when he looked at those implements at the exhibition, and at the state of the working classes at the present time, he saw that there was now no fear of any prejudices being awakened in the minds of the labourer against the use of machinery on account of its depriving him of his bread. That day was gone by, and they might thank God for it (applause). They might also thank God for another thing, and that was that the day of the demagogue was gone by (cheers). His occupation was gone (cheers), for he had now no idle, lazy, or pauperised population to talk to and excite, and therefore he could do no mischief (renewed cheers). Having shown how the use of improved machinery, in the cultivation of the land, rendered necessary the employment of increased labourers, and expressed his belief that the grain-cutting machines would yet be rendered available, the learned judge expressed his warm approbation of the automaton reaping-machine, which he considered did honour to those who had invented it and brought it forward, and concluded, amidst great cheering, by again thanking the assembly for the honour they had done him.

Earl POWIS (in the unavoidable absence of Mr. Hamond) proposed the next toast—that of "The President Elect." He remarked that as a practical farmer, in selecting Mr. Pusey to preside over the annual meeting at Lincoln, the council had but paid to him that tribute which was his due, for he was the first person who, some years ago, drew the attention of the farmer and agriculturists of England to that district which was now converted into a wide expanse of magnificent corn fields, but which before was nothing but sheep-walks and rabbit-warrens. In a district which was the type of drainage and English farming, he (Earl Powis) said that a perfect English farmer was the most fitting president for this society, in the same way that he said that in part of Gloucester there was no one who could so fittingly have presided that day as the head of the greatest family of the great "merchant princes" (loud cheers). His lordship expressed his deep regret that Mr. Pusey was unable to be present at that meeting through illness, and his earnest hope that that gentleman might be able to attend their next meeting. He ventured to say that if the agriculturists of Gloucestershire would go next year to the east of England they would find alluvial pastures which might vie even with the Vale of Berkeley; they would find light arable soils which would not fear to compete with the Cotswolds. And if the Mayor and citizens of Gloucester should go there with the farmers of the country, they would see in the waters of the Humber historical associations no less interesting than those connected with the Severn; they would see in the ports of Lincolnshire, and especially at Grimsby, places rising up which might prove formidable competitors to Gloucester, if her wealth, diligence, and enterprise were not judiciously exercised. He gave them "The health of Mr. Pusey, the president elect of the society."

Sir JOHN SHELLEY, Bart., M.P., proposed the last toast—that of "The Railway Companies, and thanks to them for their co-operation in promoting the objects of the Society." After some other remarks, the hon. baronet proceeded to observe that it happened sometimes, both in the public papers and elsewhere, that fault had been found with the railway authorities—whether truly or not he could not say—for looking too much to their dividend and not sufficiently to the convenience and safety of the public. He would not enter into this subject, but one thing was clear, that as regarded the Royal Agricultural Society the charge did not hold good. Having been a steward of the implement yard, he had always felt that the great success of these great exhibitions has always depended on the facilities which the railways have afforded invariably for the transit of implements and stock to these exhibitions. And, among the advantages which they have given, he knew of none—looking at the objects which the Society wishes to accomplish—in which the railways have so much contributed to the objects of this society as the carrying of implements at a low rate, and stock for nothing, enabling the small farmer to compete on the same terms with the rich, and the man poor in means to bring his implement to the show, and compete with the man of wealth, who otherwise would keep him out of the field. He saw the name of one implement-maker, who has won a prize, whom he recollected (as steward of these yards), having brought one implement to our show. He was enabled by the railways to exhibit a small plough at one show; and now he found him at the top of the tree, getting the first prize in his department. He alluded to Mr. Busby, as a living illustration of the fact that the facilities afforded by the railway companies have enabled a common craftsman, who has a good implement, by his talents to rise to the top of the tree. He then proceeded to express his opinion that the council had exercised a wise discretion in electing the ancient city of Gloucester as the place of holding the present exhibition, because in this city they found every railway accommodation. In the show yard they had been enabled to inspect one of the best exhibitions of implements that they had ever had, and no doubt that the following morning (Thursday) they would find an excellent exhibition of stock. In the city of Gloucester they found one kind of stock that they did not meet with elsewhere, namely, "railway stock" (a laugh). Here they found the pure-bred broad gauge, the pure-bred narrow gauge, and the cross breed of the two gauges, the "mixed gauge" (a laugh). Therefore this place was one which, of all others, the society ought to have come to. He was not aware whether any of the exhibiters would be enabled to carry away an idea with respect to these railways which would enable them to solve the problem which had perplexed both the Houses of Parliament, as to which was the best, the broad or narrow gauge, but he thought it their bounden duty to return their sincere thanks to the railway companies for the manner in which they had co-operated with the society in promoting the objects of the meeting (cheers).

Mr. S. BAKER replied to this toast; but the noise in the room from parties moving, and the distance from the reporters' table, prevented his remarks being heard by the press.

Mr. BRANDRETH GIBBS then read the list of prizes for stock, which we give below; and immediately afterwards Lord Ashburton quitted the chair, and the assembly at once broke up.

LIST OF PRIZES.

SHORTHORNS.

JUDGES—Messrs. JOHN GREY, CHARLES STOKES, and JOHN WRIGHT.

CLASS 1.—BULLS, calved previously to the 1st of July, 1851, and not exceeding four years old.

First prize of 40*l.* to Right Hon. Lord Berners, of Keythorpe-hall, Tugby, Leicester; second prize of 20*l.* to Richard Stratton, of Broad Hinton, Swindon, Wilts.

CLASS 2.—BULLS, calved since the first of July, 1851, and more than one year old.

First prize of 20*l.* to Richard Booth, of Warlaby, Northallerton, York; second prize of 15*l.* to William Fletcher, of Radmanthwaite, Mansfield, Notts.

CLASS 3.—COWS in Milk or in Calf.

First prize of 20*l.* to Henry Smith, of the Grove, Cropwell Butler, Bingham, Notts; second prize of 10*l.* to Richard Booth, of Warlaby, Northallerton.

CLASS 4.—HEIFERS in Milk or in Calf, not exceeding three years old.

First prize of 15*l.*, and second prize of 10*l.* to Richard Booth, of Warlaby, Northallerton.

CLASS 5.—YEARLING HEIFERS.

First prize of 10*l.* to B. H. Allen, of Longeroft's-hall, Lichfield; second prize of 5*l.* to Richard Stratton, of Broad Hinton, Swindon.

HEREFORDS.

JUDGES.—Messrs. WILLIAM COX, THOMAS HARTSHORNE, and JOHN WILLIAMS.

CLASS 1.—BULLS, calved previously to the 1st of July, 1851, and not exceeding four years old.

First prize of 40*l.* to the Right Hon. Lord Berwick, of Cronkhill, Shrewsbury; second prize of 20*l.* to John Carwardine, of Stockton, Bury, Leominster.

CLASS 2.—BULLS, calved since the 1st of July, 1851, and not more than one year old.

First prize of 25*l.* to Edward Price, of Courthouse, Leominster; second prize of 15*l.* to the Right Hon. Lord Berwick.

CLASS 3.—COWS in Milk or in Calf.

First prize of 20*l.* to John Monkhouse, of the Stow, Hereford; second prize of 10*l.* to James Ackers, of Prinknash-park, Painswick, Gloucester.

CLASS 4.—HEIFERS in Milk or in Calf, not exceeding three years old.

First prize of 15*l.* to the Right Hon. Lord Berwick; second prize of 10*l.* to Phillip Turner, of the Leen, Pembridge, Leominster.

CLASS 5.—YEARLING HEIFERS.

First prize of 10*l.* to Edward Price, of Court-house, Pembridge.

DEVONS.

JUDGES—Messrs. PHILIP HALSE, E. L. FRANKLIN, and Henry Trethewy.

CLASS 1.—BULLS, calved previously to the 1st of July, 1851, and not exceeding four years old.

First prize of 40*l.* to George Turner, of Barton, near Exeter; second prize of 20*l.* to Robert Wright, of Moor Farm, Taunton.

CLASS 2.—BULLS, calved since the 1st of July, 1851, and more than one year old.

First prize of 25*l.* to George Turner, of Barton, near Exeter; second prize of 15*l.* to Samuel Farthing, of Stoweycourt, Bridgewater.

CLASS 3.—COWS in Milk or in Calf.

First prize of 20*l.*, and second prize of 10*l.* to George Turner, of Barton, near Exeter.

CLASS 4.—HEIFERS in Milk or in Calf, not exceeding three years old.

First prize of 15*l.* to George Turner, of Barton, near Exeter; second prize of 10*l.* to James Hole, of Knowle-house, Dunster, Somerset.

CLASS 5.—YEARLING HEIFERS.

First prize of 10*l.*, and second prize of 5*l.*, to James Quartley, of Molland-house, South Molton.

WELSH BREEDS.

JUDGES—Messrs. J. E. JONES and THOMAS HUNT.

CLASS 1.—BULLS calved previously to the 1st of July, 1851, and not exceeding four years old.

No entry.

CLASS 2.—BULLS, calved since the 1st of July, 1851, and more than one year old.

The prize of 10*l.* to William Powell, of Eglwysnewydd Margam, Taibach, Glamorgan.

CLASS 3.—COWS, in Milk or in Calf.

First prize of 10*l.* to William Powell, of Eglwysnewydd Margam, Taibach, Glamorgan; second prize of 5*l.* to George Goode, of Croft Cottage, Carmarthen.

CLASS 4.—HEIFERS, in Milk or in Calf, not exceeding three years old.

The prize of 10*l.* to William Powell, of Eglwysnewydd, Glamorgan.

CLASS 5.—YEARLING HEIFERS.

The prize of 5*l.* to George Goode, of Croft Cottage, Carmarthen.

OTHER BREEDS,

Not including the Shorthorn, Hereford, Devon, or Welsh Breed.

JUDGES—Messrs. T. HUNT, J. E. JONES, and E. L. FRANKLIN.

CLASS 1.—BULLS, calved previously to the 1st of July, 1851, and not exceeding four years old.

The prize of 10*l.* to Nathaniel G. Barthropp, of Cretingham Rookery, Woodbridge, Suffolk.

CLASS 2.—BULLS, calved since the 1st of July, 1851, and more than one year old.

The prize of 10*l.* to Samuel Burbery, of Wroxhall, Warwick.

CLASS 3.—COWS, in Milk or in Calf.

The prize of 10*l.* to Captain Inge, of Thorpe, Tamworth, Staffordshire.

CLASS 4.—HEIFERS, in Milk or in Calf, not exceeding three years old.

The prize of 5*l.* to Edward Cane, of Berwick Court, Alfriston, Lewes, Sussex.

CLASS 5.—YEARLING HEIFERS.

The prize of 5*l.* to W. C. Cartwright, of Aynhoe-park, Brackley, Northampton.

HORSES.

JUDGES—Messrs. T. R. COLTON, W. C. SPOONER, and WILLIAM LINTON.

CLASS 1.—STALLIONS for Agricultural Purposes, foaled previously to the 1st of January, 1851.

First prize of 30*l.* to Samuel Clayden, of Little Linton, Cambridge; second prize of 15*l.* to William Wilson, of Ashbocking, Ipswich.

CLASS 2.—STALLIONS for Agricultural Purposes, foaled since the 1st of January, 1851.

First prize of 20*l.* to John Ward, of East Mersea, near Colchester; second prize of 10*l.* to George Sexton, of Thorrington Hall, Wherstead, Ipswich.

CLASS 3.—ROADSTER STALLIONS.

The prize of 15*l.* to John Lister, of Addingham, near Otley, Yorkshire.

CLASS 4.—STALLION PONIES.

The prize of 10*l.* to W. B. Reed, of Victoria-square, Clifton, near Bristol.

CLASS 5.—MARES AND FOALS for Agricultural Purposes.

First prize of 20*l.* to Henry Bailey, of Walgaston Farm, near Berkeley, Gloucester; second prize of 10*l.* to T. B. Brown, of Hampen, Andoversford.

CLASS 6.—MARE PONIES.

The prize of 5*l.* to W. B. Reed, of Clifton, near Bristol.

CLASS 7.—TWO YEARS OLD FILLIES, for Agricultural Purposes.

First prize of 15*l.* to T. B. Brown, of Hampen, Andoversford; second prize of 5*l.* to James E. Owen, of Hodcott, West Ilsley, Newbury.

SHEEP.

LEICESTERS.

JUDGES—Messrs. HUGH AYLMER, SAMUEL BENNETT, and HENRY CHAMBERLAIN.

CLASS 1.—SHEARLING RAMS.

First prize of 30*l.* to William Sanday, of Holme Pierrepoint, Nottinghamshire; second prize of 15*l.* to T. E. Pawlett, of Beeston, Sandy, Bedfordshire.

CLASS 2.—RAMS of any other age.

First prize of 30*l.* to T. E. Pawlett, of Beeston, Sandy, Bedfordshire; second prize of 15*l.* to William Sanday, of Holme Pierrepoint, Nottinghamshire.

CLASS 3.—PENS of FIVE SHEARLING EWES, of the same Flock.

First prize of 20*l.*, and second prize of 10*l.*, to William Sanday, of Holme Pierrepoint, Nottinghamshire.

SOUTHDOWN, OR OTHER SHORT-WOOLLED SHEEP.

JUDGES—Messrs. EDWARD TRUMPER, JOHN WATERS, and EDWARD POPE.

CLASS 1.—SHEARLING RAMS.

First prize of 30*l.*, and second prize of 15*l.*, to Jonas Webb, of Babraham, Cambridge.

CLASS 2.—RAMS of any other age.

First prize of 30*l.* to Henry Lugar, of Hengrave, Bury St. Edmunds; second prize of 15*l.* to William Rigden, of Hove, near Brighton.

CLASS 3.—PENS OF FIVE SHEARLING EWES, of the same Flock.

First prize of 20*l.*, and second prize of 10*l.*, to Henry Lugar, of Hengrave, Bury St. Edmunds.

LONG-WOOLLED SHEEP,

Not qualified to compete as Leicesters.

JUDGES—Messrs. JOHN ABBOT, CHARLES CLARKE, and N. C. STONE.

CLASS 1.—SHEARLING RAMS.

First prize of 30*l.* to William Lane, of Broadfield Farm, Northleach; second prize of 15*l.* to William Garne, of Aldsworth, Northleach.

CLASS 2.—RAMS of any other age.

First prize of 30*l.* to William Slatter, of Stratton, Cirencester; second prize of 15*l.* to Edward Handy, of Sevenhampton, Andoversford.

CLASS 3.—PENS OF FIVE SHEARLING EWES, of the same Flock.

First prize of 20*l.*, and second prize of 10*l.*, to Willism Lane, of Broadfield Farm, Northleach.

PIGS.

JUDGES: Messrs. JOHN CLAYDEN, WILLIAM HESSELTINE, and HENRY EDDISON.

CLASS 1.—BOARS of a large breed.

First prize of 15*l.* to Robert Crossley, of Holland St. Miles, Platting Newton, Manchester; second prize of 5*l.* to Thomas Horsfall, of Burley Hall, Otley, Yorkshire.

CLASS 2.—BOARS of a small breed.

First prize of 15*l.* to William Northey, of Lake Lifton, Devon; second prize of 5*l.* to John Moon, of Lapford, Crediton.

CLASS 3.—BREEDING SOWS of a large breed.

The prize of 10*l.* to Thomas Craven, of Whetley St. Manningham, Bradford.

CLASS 4.—BREEDING SOWS of a small breed.

The prize of 10*l.* to John Moon, of Lapford, Crediton, Devon.

CLASS 5.—PENS OF THREE BREEDING SOW PIGS of a large breed, of the same litter, above four and under eight months old.

The prize of 10*l.* to William James Sadler, of Bentham Purton, Swindon.

CLASS 6.—PENS OF THREE BREEDING SOW PIGS of a small breed, of the same litter, above four and under eight months old.

The prize of 10*l.* to the Right Hon. Lord Wenlock, of Escrick Park, Yorkshire.

POULTRY.

JUDGES.—Messrs. JOHN BAILEY, T. B. WRIGHT, and WILLIAM TORR.

CLASS 1.—DORKING FOWLS—Cock and two Hens—chickens of 1853.

First prize of 5*l.* to Capt. Hornby, R.N., of Knowsley Cottage, Prescott; second prize of 3*l.* and third prize of 2*l.* to James Lewry, of Handcross, Crawley, Sussex; fourth prize of 1*l.* to T. T. Parker, of Astley Hall, Chorley, Lancaster.

CLASS 2.—DORKING FOWLS, more than one year old—Cock and two Hens.

First prize of 5*l.* and second prize of 3*l.* to Capt. Hornby, R.N., of Knowsley Cottage, Prescott; third prize of 2*l.* to Right Hon. Viscount Hill, of Hawkstone, Shrewsbury; fourth prize of 1*l.* to T. T. Parker, of Astley Hall, Chorley.

CLASS 3.—SPANISH FOWLS—Cock and two Hens.

First prize of 5*l.* and second prize of 3*l.* to Capt. Hornby, R.N., of Knowsley Cottage, Prescott; third prize of 2*l.* to W. B. Mapplebeck, Bullring, Birmingham; fourth prize of 1*l.* to J. P. Adams, of Newland, near Malvern, Worcester.

CLASS 4.—COCHIN CHINA FOWLS—Cock and two Hens—chickens of 1853.

First prize of 5*l.* to Edward Terry, of Aylesbury, Bucks; second prize of 3*l.* to Charles Punchard, of Blunt Hall, Haverhill, Suffolk; third prize of 2*l.* to Mrs. S. R. Herbert, of Powick, near Worcester; fourth prize of 1*l.* to W. C. Gwynne, of Sandback, Cheshire.

CLASS 5.—GAME FOWLS—Cock and two Hens.

First prize of 3*l.* to N. N. Dyer, of Bredon Manor House, Tewkesbury; second prize of 2*l.* to Edward Lowe, of Comberford Flour Mills, Tamworth; third prize of 1*l.* to Edward Glover, of Olton, near Solihull, Warwick.

CLASS 6.—HAMBURG FOWLS—golden and silver spangled, or golden and silver penciled—Cock and two Hens.

First prize of 3*l.* to William Ludlam, of Bradford, York; second prize of 2*l.* to J. Jennens, of Moseley, Birmingham; third prize of 1*l.* to Thomas Lowe, of Whateley, Fazeley, Staffordshire.

CLASS 7.—MALAY FOWLS—Cock and two Hens.

First prize of 3*l.* to A. C. Sayers, of Clanville House, Andover; second prize of 2*l.* to Henry Worrall, of Knotty Ashhouse, near Liverpool; third prize of 1*l.* to W. B. Mapplebeck, Bullring, Birmingham.

CLASS 8.—POLAND FOWLS—Cock and two Hens.

First prize of 3*l.* to Christopher Rawson, of the Hurst, Walton-on-Thames; second prize of 2*l.* to William Cox, of Brailsford Hall, Derby; third prize of 1*l.* to W. G. Vivian, of Singleton, Swansea.

CLASS 9.—TURKEYS—Cock and two Hens.

First prise of 5*l.* to Right Hon. Viscount Hill, Hawkstone, Shrewsbury; second prize of 3*l.* to John Fairlie, of Cheveley Park, Newmarket; third prize of 2*l.* to R. T. Head, of the Briars, Alphington, Exeter.

CLASS 10.—GEESE—Gander and two Geese—hatched in 1853.

First prize of 5*l.* and second prize of 3*l.* to T. T. Parker, of Astley Hall, Chorley, Lancashire; third prize of 2*l.* to Capt. Hornby, R.N., of Knowsley Cottage, Prescott; fourth prize of 1*l.* to T. T. Parker, of Astley Hall, Chorley.

CLASS 11.—AYLESBURY DUCKS—Drake and two Ducks.

First prize of 3*l.* to John Weston, of Oxton-road, Aylesbury; second prize of 2*l.* to Miss L. C. Stow, of Bredon Tewkesbury; third prize of 1*l.* to Miss Wilcox, of Nailsea court, Bristol.

CLASS 12.—ROUEN DUCKS—Drake and two Ducks.

First prize of 3*l.* to Henry Worrall, of Knotty Ash House, near Liverpool; second prize of 2*l.* to W. W. Rowe, of Longbrooke, Milton Abbot, Devon; third prize of 1*l.* to Capt. Hornby, R.N., of Knowsley Cottage, Prescott.

CLASS 13.—DUCKS of any other variety—Drake and two Ducks.

First prize of 3*l.* and second prize of 2*l.* to H. S. Pigott, of Brockley Court, Bristol; third prize of 1*l.* to Miss S. Buckle, of Moat House, Uckington, Cheltenham.

SPECIAL PRIZES.

SHROPSHIRE, OR OTHER GREY AND BLACK-FACED SHORT-WOOLLED SHEEP.

JUDGES.—Messrs. W. T. HARTSHORNE, W. COX, and JOHN WILLIAMS.

CLASS 1.—RAMS of any age.

First prize of 20*l.* to John Gillett, of Brize Norton, Witney, Oxon; second prize of 10*l.* to Thomas Horton, of Hamage Grange, Cressage, near Shrewsbury.

CLASS 2.—PEN of FIVE EWES of any age, with their Lambs.

The prize of 10*l.* to William Foster, of Kinver Hill Farm, Stourbridge.

CLASS 3.—PEN of FIVE SHEARLING EWES.

The prize of 10*l.* to William Foster, of Kinver Hill Farm, Stourbridge.

COMMENDATIONS.

SHORTHORNS.

Mr. J. Niblett's bull, Mr. E. W. S. Owen's cow, Mr. Richard Stratton's heifer, and Mr. E. Bate's yearling heifer.

HEREFORDS.

Mr. George Sexty's bull*, Mr. Walter Maybery's heifer*, Mr. John Monkhouse's bull, Lord Berwick's cow, Mr. E. Williams's heifer, and Mr. John Naylor's yearling heifer.

DEVONS.

Mr. S. Farthing's bull*, Mr. W. M. Gibb's cow*, Mr. James Holes's cow*, Mr. John Tucker's cow*, Mr. W. M. Gibb's heifer*, Mr. G. Turner's yearling heifer*, Mr. J. Holes's yearling heifer*, Mr. John Tucker's bull, Mr. Thos. Webber's cow, Mr. A. Umber's 2 heifers, Rev. C. Smith's yearling heifers, and Mr. S. Farthing's yearling heifer.

CATTLE OF ANY BREED.

Mr. E. Cane's yearling heifer*, and Mr. S. Burbery's cow.

HORSES.

Mr. T. Dunckley's stallion*, Mr. W. Greenaway's stallion*, Mr. F. L. Popham's stallion*, Mr. J. Crump's stallion, Mr. W. Wilson's stallion, Mr. J. Ramsbottam's stallion, Right Hon. Earl of Jersey's stallion, Mr. W. Melsome's stallion, Mr. H. Watt's mare and foal, and the Right Hon. Lord St. John's mare and foal.

SHEEP (LEICESTERS).

Mr. W. Sandy's shearling ram*, M. W. Sanday's ram*, Mr. T. E. Pawlett's shearling ram, Mr. W. Sanday's shearling ram, Mr. John Borton's 2 shearling rams, Mr. G. Radmore's shearling ram, Mr. T. E. Pawlett's 4 rams, Mr. W. Sanday's 3 rams, Mr. G. Turner's rams, Mr. S. Umber's rams, and Mr. W. Abraham's pen of shearling ewes.

SHORT WOOLS.

Mr. H. Lugar's shearling ram*, Mr W. Sainsbury's ram*, Mr. W. Rigden's pen of shearling ewes*, Right Hon. Lord Walsingham's shearling ewes*, Mr. Jonas Webb's 2 shearling rams, and his Grace the Duke of Richmond's pen of shearling ewes.

LONG WOOLS.

Mr. W. Garne's shearling ram*, Right Hon. Lord De Mauley's ram*, Mr. W. Lane's ram*, Mr. G. Fletcher's 2 pens of shearling ewes*, Mr. E. Handy's shearling ram, Mr. G. Hewer's shearling ram, Mr. W. Cother's shearling ram, Mr. G. Fletcher's 2 shearling rams, Mr. W. Garne's ram, Mr. W. Garne's pen of shearling ewes, Mr. T. Gillett's pen of shearling ewes.

SHROPSHIRE OR OTHER GREY AND BLACK-FACED SHEEP.

Mr. J. Gillett's ram*, Mr. S. Meire' ewes*, and Mr. W. Foster's pen of shearling ewes*

PIGS.

Mr. G. Maugle's breeding sow**, Mr. H. S. Hayward's boar of a small breed*, Right Hon. Lord Wenlock's boar of a small breed*, Rev. C. T. James's breeding sow*, Mr. T. Horsfall's breeding sow*, Mr. W. Northey's breeding sow*, Mr. W. Ludlow's breeding sow*, Mr. R. B. Hill's boar of a small breed, Mr. T. Horsfall's boar of a small breed, Mr. R. B. Hill's boar of a small breed, Mr. E. Bowly's breeding sow, Mr. W. Sanday's breeding sow, Mr. R. B. Hill's breeding sow, Mr. D. Leeming's breeding sow, Mr. John Moon's breeding sow, Mr. S. Ashton's breeding sow, and Mr. W. Northey's pen of breeding sows.

POULTRY.

Right Hon. Viscount Hill's pen of Dorking fowls*, Dr. Hitchman's pen of Dorking fowls*, Mr. H. Smith's pen of Dorking fowls*, Mr. J. Fairlie's pen of Dorking fowls*, Viscount Hill's pen of Dorking fowls*, Mr. J. Lewry's pen of Dorking fowls*, Mr. T. Lyne's pen of Dorking fowls*, Mr. C. Rawson's Poland fowls*, Rev. J. Herbert's gander and two geese*, Mr. R. Glover's gander and two geese*, Mr. W. G. K. Breavington's gander and two geese*, Mr. E. Terry's Dorking fowls, Mr. W. B. Mapplebeck's Dorking fowls, Mr. J. Lewry's Dorking fowls, Mr. C. Rawson's Cochin China fowls, Miss A. F. Vernon's gander and two geese, and Mr. John Fairlie's gander and two geese.

* Highly commended. ** Very highly commended.

The following are the respective entries of animals at the shows of the Society :—

Locality.	*Year of Meeting.*	*No. of Entries.*
Oxford	1839	350
Cambridge	1840	451
Liverpool	1841	463
Bristol	1842	497
Derby	1843	608
Southampton	1844	716
Shrewsbury	1845	527
Newcastle	1846	775
Northampton	1847	580
York	1848	866
Norwich	1849	799
Exeter	1850	769
Windsor	1851	1226
Lewes	1852	1054
Gloucester	1853	1041

IMPLEMENTS.

JUDGES—Mr. Joseph Druce, Mr. J. V. Gooch, Mr. T. W. Grainger, Mr. Henry Hanman, Mr. Wm. Lister, Mr. J. H. Nalder, Mr. Wm. Owen, Mr. J. J. Rowley, Mr. Thomas Scott, Mr. Wm. Shaw, Mr. O. Wallis, and Mr. Wm. Woodwood. CONSULTING ENGINEERS—Messrs. Easton and Amos.

The following is the award made by the Judges :—

Plough best adapted for General Purposes.—To W. Busby, 7*l.*

Plough best adapted for Deep Ploughing.—W. Ball, 7*l.*

One-way or Turn-wrest Plough.—Ransome and Sims, 7*l.*

Paring Plough.—T. Glover, 5*l.*

Dynamometer.—E. H. Bentall, 5*l.*

Subsoil Pulverizer.—J. and F. Howard, 5*l.*

Machine for making Draining Tiles or Pipes for agricultural purposes.—J. Whitehead, 10*l.*

Instruments for hand use in Drainage.—H. Winton and Sons, 3*l.*

Heavy Harrow.—W. Williams, 5*l.*

Light Harrow.—J. and F. Howard, 5*l.*

Cultivator, Grubber, and Scarifier.—Ransome and Sims, 10*l.*

Pair-horse Scarifier.—R. Coleman, 5*l.*

Drill for General Purposes.—R. Garrett and Sons, 10*l.*

Steerage Corn and Turnip Drill.—R. Hornsby and Son, 10*l.*

Drill for small occupations.—J. Smyth and Son, 5*l.*

Best and most economical small occupation Seed and Manure Drill for flat or ridged work.—R. Garrett and Son, 5*l.*

Turnip Drill on the flat.—R. Garrett and Son, 10*l.*

Turnip Drill on the ridge.—R. Hornsby and Son, 10*l.*

Dropping Machine for depositing seed and manure.—R. Garrett and Son, 10*l.*

Manure Distributor.—R. Garrett and Son, 10*l.*

Horse Hoe on the flat.—R. Garrett and Son, 5*l.*

Horse Hoe on the ridge.—J. and F. Howard, 5*l.*

One-horse Cart for general purposes.—T. Milford, 5*l.*

Light Waggon for general purposes.—W. Crosskill, 10*l.*

Portable Steam-engine, not exceeding six horse power, applicable to thrashing or other agricultural purposes.—Clayton and Co., 20*l.*

Second best ditto.—Hornsby and Son, 10*l.*

Fixed Steam-engine, not exceeding eight horse power, applicable to thrashing or other agricultural purposes.—Clayton and Co., 20*l.*

Second best ditto.—Barrett, Exall, and Co., 10*l.*

For the best Portable Thrashing Machine, not exceeding two horse power, for small occupations.—Messrs. Ransome and Sims, 10*l.*

For the best Portable Thrashing Machine, not exceeding six horse power, for larger occupations.—Messrs. Ransome and Sims, 15*l.*

For the best Portable Thrashing Machine, not exceeding six horse power, with Shaker, Riddle, and Winnower, that will best prepare the corn for the finishing dressing machine, to be driven by steam.—Mr. Charles Hart, 20*l.*

For the best fixed Thrashing Machine, not exceeding six horse power, with Shaker, Riddle, and Winnower, that will best prepare the corn for the finishing dressing machine, to be driven by steam.—Messrs. Clayton, Shuttleworth, and Co., 20*l.*

For the best Corn-dressing Machine.—Messrs. Hornsby and Son, 5*l.*

For the best ditto, for small occupations.—Messrs. Hornsby and Son, 5*l.*

Grinding Mill for breaking agricultural produce into meal.—Clayton, Shuttleworth, and Co., 10*l.*

Linseed and Corn-crusher.—E. R. Turner and Co., 5*l.*

Chaff-cutter, to be worked by horse or steam power.—J. Cornes, 10*l.*

Chaff-cutter to be worked by hand power.—J. Cornes, 5*l.*

Turnip-cutter.—B. Samuelsou, 5*l.*

Oil Cake Breaker, for every variety of cake.—R. Garrett and Son, 5*l.*

Oil Cake Breaker, for thin cake.—W. N. Nicholson, 3*l.*

Most ecouomical Steaming Apparatus for general purposes.—W. P. Stanley, 5*l.*

Churn.—Burgess and Key, 3*l.*

Water Drill, to drill four rows of turnips with artificial manures on the flat.—R. and J. Reeves, 10*l.*

Revolving Horse Hoe.—R. Garrett and Son, medal.

Digging Machine.—B. Samuelson, medal.

Draining Level.—H. A. Thompson, medal.

Seed Cleaning Machine.—J. Gillam, medal.

Patent Straw Shaker.—H. Brimsmead, medal.

Draining Plough, improved.—Fowler and Fry, medal.

"New Implement," Bean-cutter.—Ransome and Sims, medal.

Improved Haymaking Machine, with double action.—Smith and Ashby, medal.

SPECIAL PRIZE OFFERED BY PHILIP PUSEY, ESQ.

10*l.* for the best Water Drill to drill four Rows of Turnips, with Artificial Manures, on the flat.—Messrs. R. and J. Reeves.

The following were highly commended:—

Corn Rakes, made of Tubular Iron.—John Wood Sharman.

Tools for Draining Land.—Mapplebeck and Lowe.

Screw Lifting Jack.—William Dray and Co.

Clod-crusher.—W. Crosskill (for its self-cleaning principles).

Norwegian Harrow.—W. Crosskill.

Drills generally for simplicity of construction and moderation of prices.—J. Smyth and Son.

Drill for General Purposes.—R. Hornsby and Son.

Drill for Manure and Turnips on the flat.—R. Hornsby and Son.

Steerage Seed and Corn Drill, and Combined Seed-sowing and Seed-drilling Machine.—R. Garrett and Son.

Drill for small occupations.—Marychurch and Son.

Manure Distributor.—Holmes and Sons.

Dropping Machine for Grain.—W. East.

Steel Grinding Mill.—G. Hurwood.

Patent Gouge Turnip Cutter.—Hugh Carson.

Roller Mill.—W. P. Stanley.

Patent Socketing apparatus.—J. Whitehead.

Combined seed sowing and seed drilling machine, exhibited by Messrs. R. Garrett and Son.

Four-horse portable thrashing machine, exhibited by Messrs. R. Garrett and Son.

Four-horse portable thrashing machine, exhibited by Messrs. Barrett, Exall, and Andrews.

Two-horse portable thrashing machine, exhibited by Messrs. R. Garrett and Son.

Portable engine, exhibited by Messrs. Ransome and Sims.

Fixed engine, exhibited by Messrs. Tuxford and Sons.

Drill for turnips and mangold wurzel, with manure on the ridge, exhibited by Messrs. R. Garrett and Son.

The following were commended:—

Set of long light Cart Harness complete.—Richard Vick.

Strong Sheep-folding Hurdle.—Benjamin Wright.

Clod-crusher.—Gibson and Son (for its self-cleaning principles).

Liquid and Manure Drill.—Tasker and Fowle.

Drill for small occupations.—R. Garrett and Son.

Tile Machine.—T. Scragg.

Brickmaking Machine.—Fowler and Fry.

An Improved Portable Copper.—Henry Attwood Thompson.

Slate Milk Cooler.—John Cole.

Asphalte Cauldron.—James Wood.

Mincing Machine, for mincing meat.—S. Nye, and J. Gilbert.

A Double-action Green-house Pump.—R. Read.

Gig Harness, with improved fastening instead of buckle.—J. C. White.

Double-ridged Plough.—J. and F. Howard.

Plough Blades.—J. and F. Howard.

Clod-crushers.—W. Crosskill.

Turn-wrest, for shallow ploughing, and combination as a moulding plough.—J. Comins.

Sub-Pulverizer, for its lightness of draught.—R. Read.

Sub-Pulverizer, for its efficient leverage.—Gray and Co.

Heavy Harrows.—J. and F. Howard.

Light Harrows.—W. Williams.

Four-horse Grubber, for high-ridged lands.—J. Coleman.

Four-horse Grubber, for cultivating light soil.—C. Hart.

Pair-horse Scarifier, for cultivating light soil.—C. Hart.

Ridge Hoe.—W. Busby.

Ridge Hoe, for simplicity of expansion and contraction.—E. Hill.

Cast-iron Manger, Water-trough, and Rack.—William Dray and Co.

Cottage Mangle.—William Dray and Co.

Improved Cast-iron Stable Furniture.—Edward Hill and Co.

Wrought-iron Gate.—Edward Hill and Co.

Patent Weighing Machine.—Edward Hill and Co.

Pig Trough.—Barnard and Bishop.

Cottage Maugle.—Barnard and Bishop.

Self-adjusting Cart Saddle.—James Dunlop.

Portable engine, exhibited by Messrs. Ransome and Sims.

Ditto, exhibited by Messrs. Bach and Co.

Ditto, exhibited by Messrs. R. Garrett and Son.

Ditto, exhibited by Messrs. Barrett and Co.

Ditto, exhibited by Messrs. Tuxford and Son

Fixed engine, exhibited by Messrs. W. Dray and Co.

Ditto, exhibited by Messrs. Ransome and Sims.

Ditto, exhibited by Messrs. R. Hornsby and Son.

Double-action churn, exhibited by Mr. George Hancock.

Thrashing machine, exhibited by Messrs. Tuxford and Son.

Four-horse portable thrashing machine, exhibited by Messrs. R. Hornsby and Son.

The following were selected for a further trial during harvest:—

Bell's Reaper.—W. Crosskill.

M'Cormick's Reaper.—Burgess and Key.

Hussey's Improved Reaper.—Dray and Co.

Hussey's Improved Reaper.—Garrett and Son.

Hussey's Reaper.—O. Hussey.

M'Cormick's Reaper.—B. Samuelson.

Of these it will be recollected that the reaper exhibited by Mr. Obed Hussey, the inventor of the machine known by his name, is one. But, as soon as the selection of the Council was published, Messrs. Dray and Co. sent in a protest, in which they call attention to the thirty-eighth article of the Society's regulations, and state that by an agreement entered into by them with Mr. Hussey, that gentleman sold to them the sole and exclusive right of manufacturing and vending certain improvements in the reaping machine of which he was the inventor, and agreed to do all in his power to promote Messrs. Dray's interest in its sale, and not to licence or authorize any other person to make or sell the same, or any improvement thereof. On these grounds, Messrs. Dray protest against the machine exhibited by Mr. Hussey "being allowed to obtain the sanction of the association." The effect of this protest will be, in case the reaper of Mr. Hussey has the prize awarded to it, that the Council will withhold the prize for three months, in order that the parties may have an opportunity in the interval of settling the question of infringement of right in a court of law.

THURSDAY.—This morning the Cattle and Implement Yards were thrown open to the public at the charge of half-a-crown. The weather was most unfortunate, rain unceasing and steadily descending converted the approaches to the Exhibition into perfect swamps, perilous to pass, and requiring an amount of agility and perseverance in the traveller which nothing but an unflinching determination to witness the show could have called forth.

The vast increase in the entries which goes on yearly may be seen by the following tabular statement:—

Year of Meeting.	*Locality.*	*Entries of Implements.*
1839..	Oxford.....	23
1840..	Cambridge	36
1841..	Liverpool	312
1842..	Bristol.....	455
1843..	Derby	508
1844..	Southampton	948
1845..	Shrewsbury.....	942
1846..	Newcastle	735
1847..	Northampton	1321
1848..	York	1508
1849..	Norwich.....	1882
1850..	Exeter.....	1223
1851..	Windsor	No exhibition of implements.
1852..	Lewes	1897
1853..	Gloucester	2032

THE GENERAL MEETING OF THE ROYAL AGRICULTURAL SOCIETY.

The general meeting of the members took place on Friday morning, in the Grand Jury Room, at the Shire Hall; Lord Ashburton, the retiring President, occupying the chair. There was rather a small attendance of members, among whom were the following:—Lord Berners, Mr. Raymond Barker, Sir M. Ridley, Mr. Druce, Mr. Webb, Mr. Fisher Hobbs, Mr. Milward, Mr. C. Barnett, Mr. Wright, Mr. Rickard, Mr. Winnall, Mr. Bubb, Mr. Webster, Mr. Gillett, Mr. J. Hudson, &c.

The CHAIRMAN introduced the business of the meeting, and called upon Mr. Raymond Barker to move the first resolution.

Mr. RAYMOND BARKER rose and said, in the absence of any other member, he ventured to move a vote of thanks to the Mayor and Corporation of the city of Gloucester. In accordance with the requirements of their charter, they visited different localities every year. Their meeting, in this city, the present year, under such favourable auspices, must be gratifying to all concerned, and a matter of exultation to the county of Gloucester, and the whole district assigned for their present visit. Had they not met with the co-operation and friendly assistance they had, and which was so important an ingredient in all such public matters, there would probably have been anything but so favourable a meeting as they had had. He regretted that more members of the society were not present; but the Royal Agricultural Society of England desired through his voice to express the thanks which they felt to the Mayor and Corporation of this ancient city, for all they had done to promote the success of their meeting—for co-operating with them to promote the object they had in view in coming here, and making the exhibition one of attraction to all who took an interest in British agriculture. They all knew how essential to the success of their meeting the exertions of the authorities of the place were; and the society were deeply indebted to the Mayor and Corporation, for every possible assistance that could be asked of them had been cordially rendered—everything that could possibly tend to the success of the meeting having been done by them. In recognition of these eminent services, therefore, it was that he had the pleasure of proposing that the cordial and warmest thanks of the general body of the society be presented to the Mayor and Corporation, for their kindly co-operation with the society in promoting the objects they had in view, and ensuring the success of their meeting (applause).

Mr. Druce seconded the proposition, which was put by the Chairman, and carried by acclamation.

The MAYOR then rose and said, he was sure every member of the local committee fully participated with him in the great satisfaction he experienced in finding that the arrangements they had carried out had met with the entire approbation of the members of the Royal Agricultural Society. And now, in bidding them farewell, they would allow him to express a hope that if the time should ever arrive when they might consider it expedient to again visit the Gloucester and South Wales district, they would cherish some recollection of their present meeting as an additional inducement (applause).

Mr. MILLWARD then proposed that the thanks of the Society be given to Mr. Wm. Jones, for allowing his land for the use of the show yard, both for cattle and implements, and also the ground for the trial of the implements. When they looked to the circumstance that the land was so contiguous to the show yard, and when they remembered the injury that had been done to it from the unfavourable weather, they would, he was sure, consider with him that they were under peculiar obligations to Mr. Jones. He therefore begged to move that the thanks of the Society be given to Mr. Jones (applause).

Mr. RAYMOND BARKER, seconded the resolution with the greatest cordiality; for he had had the pleasure of knowing Mr. Jones by good report for a long time, and coming to the meeting had given him an opportunity of forming a closer intimacy which had been most pleasant to him (Mr. Barker). He was bound to confirm all that had been said respecting the gratitude that was due to Mr. Jones for placing his grounds at their disposal. From the contiguity of the show yard to the town they had been warranted in expecting a large attendance, but the weather having been so unfavourable had doubtless kept numbers away. That day, however, Providence seemed to smile upon them, and they now saw hundreds and thousands already proceeding in the direction of the show yard, which he hoped would in a measure redeem the misfortunes of the previous days. With regard to Mr. Jones, he was bound to say that there was no individual in all the various places they had visited had ever evinced a warmer and more earnest desire to carry out everything they had wished; more than that, his anxiety lest anything should be found wanting on his part had been such as to excite his (Mr. Barker's) concern. That he (Mr. Jones) had abundantly succeeded, he thought everybody would most fully acknowledge; and, therefore, their warmest thanks were due to him.

The resolution was carried *nem. con.*

Mr. ANTHONY JONES, in the absence of his brother, begged to return his best thanks. It would, doubtless, have been a great source of satisfaction to him to have been present, and heard what they had said of him. He could not allow the opportunity to pass without thanking them for the very handsome expression of thanks; and he only hoped that what his brother had done had merited it.

Sir MATTHEW RIDLEY moved that the thanks of the society be given to the Local Committee. They had had most difficult duties cast upon them, which they had discharged with zeal and success. As far as his experience of these meetings had gone, the arrangements had never been more satisfactory than they had at the present one. This was in a great degree owing to the local assistance received by the council from those gentlemen who clearly understood what was required. He therefore had much pleasure in moving a vote of thanks to the Local Committee.

Mr. DRUCE having seconded the motion, it was, like the others, carried unanimously.

Mr. ALDERMAN WALKER, as one of the Local Committee, expressed the gratification he felt that their arrangements had met the approbation of the society. He regretted that the weather of the previous day had marred the enjoyment of many thousands of persons; but, with Mr. Barker, he hoped that the sunshine of that day would be the means of attracting large numbers to the show-yard, and thus make up for the loss the society had sustained.

Mr. BARNETT, of Stratton Park, had great pleasure in proposing the thanks of the society be given to the Railway Companies, who had come forward in so handsome and liberal a manner to forward the objects of this great society. It had been lately said, and perhaps not inaptly, that the railways were the fourth estate; that they should be coupled with agriculture, manufactures, and commerce. If any occasion could more conduce to their deserving this high eulogium, it was the very great attention and readiness with which they had come forward to carry stock and implements upon this occasion. As one of the stewards of the yard he had not, perhaps, been inappropriately called upon to move a vote of thanks to the railway companies; for he believed there had not been a single instance of any neglect or unnecessary delay on the part of the railways. On the other hand, he believed that where there had been some slight neglect or oversight on the part of owners of stock, the companies had taken upon them-

selves to send the stock, &c., to the yard with the greatest alacrity.

The vote of thanks having been seconded was unanimously agreed to.

Mr. Raymond Barker said he had another duty to perform, which he felt to be a high privilege, though a matter of anxiety, because he could not but regret that there should not have been more present to concur with his proposal, and he was sorry it had not fallen into abler hands. It was his great pleasure and pride to ask the Society to concur in his estimate of the noble President's ability and energy, which at this period it was the duty of the Society to acknowledge. At the Town Meeting, in May, his lordship was elected to the presidential chair for the year ensuing. That year had passed with great cordiality and unanimity; and it was now, after a man had been tried, and acknowledged not to have been found wanting, that he asked the Society to concur with him in thanking him for the manner in which he had discharged his arduous duties, and to ask him to continue to aid and direct them with his great ability, in the proper course of proceeding in the time to come. He was now about to vacate the chair, but before he did so, it was their duty—and he was sure they would all readily respond to his request—to accord to him their cordial and very best thanks, for the zeal, attention, courtesy, and kindness with which he had met each and every one of them in the discharge of the duties imposed upon him by the occupation of the presidential chair (warm applause).

Sir M. Ridley cordially seconded the vote of thanks, remarking that as a member of the council he believed that the general body of the council must be aware that his lordship had omitted no opportunity of evincing that interest in the society which had contributed so much to the success of their present meeting (applause).

The Chairman, after acknowledging the vote of thanks, remarked that Mr. Barker had alluded to the arduous duties imposed upon him as President, but one great merit of this society—for a great merit it was—was that arduous duties were not imposed upon the President. The council did their work themselves, and they had done so from the beginning. They had been successful in uniting the efforts of men capable of carrying on with success the machinery of so great an institution as this. Of all the duties which had been imposed upon him in the course of his Presidential year, none had been so grateful to him as that of proposing to them that the thanks of the society should be presented to the mayor and corporation of this ancient city, and to the other authorities who had been mentioned. In connection with that, their annual meeting, they must all have been struck by the cordiality and sympathy with which they had been received by the commercial population of this thriving city; and it was by such general sympathies that they were rewarded, and it was still more by the co-operation which such sympathies denoted that they had succeeded in their previous meeting. The town was beautifully decorated. It was more striking even than Exeter, when they met there; and Exeter was beautiful. The arrangements had been perfect, and the order and tranquillity that had reigned throughout the city had been complete. But the person who had assisted them most was Mr. Jones, who had come forward to relieve the council from all the anxieties and all the details of management which in so complicated an undertaking as theirs must necessarily be thrown upon some one or other. To him, certainly, their best thanks were due; and to the Railway Companies also; for without them, he did not see how their society could work at all; for it would be impossible to collect together the immense number of implements and cattle and people who came to inspect them, but for their assistance. In a conversation with Mr. Hudson, that morning, respecting the prospects of the society, that gentleman had suggested that there were dangers arising even out of the very success of their efforts, as regarded the implements and the stock exhibited; for no one could work long in any direction, even successfully, without falling into some points of weakness—some little points of danger; they could not breed cattle up to a very high point, without something giving way. So it was with their society. They had succeeded, no doubt, with their cattle, in bringing up the most beautiful models; but he could not help thinking that they ran the risk, the same time that they got size and fat, and absence of bone, of losing flesh altogether. For it must be remembered that nature was most economical in all her proceedings. For a time, she went on in her usual course, but when a thing was not wanted, she ceased to supply it altogether; they were educating their stock as finely as ladies were educated in the drawing-room. The effect was that their stock not being called upon to travel, or use their limbs in any way, those limbs would at last cease to be furnished with the muscle, with the flesh, which is necessary to give motion. If they were to cut up a dancing-master, or a blacksmith, they would find good flesh upon him, and upon his son and his grandson; but if they were to cut up their pigs and beeves, in the course of a few generations they would find all that fine muscle had disappeared—dwindled down into mere pulp; the feeding property which was most looked to for supplying our population with meat, would altogether cease. He was afraid the same evil arose also with regard to implements. They tested highly, and no doubt great advantages arose from that course, for it not only educated and informed the population as to the value and necessity of implements, but it also educated the machine makers themselves; it told them exactly where their deficiency lay, and where was the superiority of their competitors; although all of them in each succeeding year took a start from the higher point of elevation at which any of them had yet arrived, so that each had the value of the knowledge and experience of the whole mass of machine makers brought together. They knew all that every other man knew. They had the benefit of the experience of all, and with their wits they set to work to see if they could not build another storey for the next year. This was an immense advantage. He trusted their implement trials would continue, because he believed from such trials the greatest benefit accrued to society; but, as he had said before, an evil might arise, and that evil was that the implement makers looked alone to the immediate, and not to the ultimate results—to enable the farmer to work in his field. They were forced in the struggle for ascendancy—that struggle for the first place was so important—the difference between the first and second place being so great [it would perhaps be better if they could reduce the difference between them] they were induced to have recourse to dodges, rather than to fair means to attain their ends. They were making machinery too complicated. They were putting two valves where one might do: introducing brass instead of iron, for the simple machine, knowing well when they sent it to the farmer they must put iron back again. In the sample implements they introduced a quantity of extra work. They are beautifully put together, and got up in the most perfect manner, so as to tend to the most complete success; yet when they are put together in a rougher manner, they rather elegged and diminished that simplicity of repair, which was so essential a quality which the farmer should use (Hear, hear). Perhaps it was presumption in him to mention these matters, but he did so as they had been suggested to him by men well qualified to advance them under these circumstances. Their next visit was to the town of Lincoln, and he hoped many that he saw around him, who had taken a taste for their shows, and had seen, above all, the great advantages which the public might derive from them, would join and assist them, and cheer them in their efforts for their improvement at that meeting also. He had the pleasure to deliver over his chair to Mr. Pusey, who, he regretted to say, was unable to be present. He had seen him the previous day, and he had told him if it were possible he would attend; but his failing health at the present time rendered it absolutely necessary for him to take such precautions as not to injure it, and thus disable him from continuing those important services which he had heretofore rendered to them; for, after all, there was no person living who had done more either to raise the society originally, or to carry it on. His lordship narrated how he, together with Mr. Pusey, Earl Spencer, and another gentleman at the back of the speaker's chair, had each subscribed £50 to start the society—Mr. Pusey being the prime mover. That gentleman, however, had not confined his services to merely starting their society, but through their journal he had furnished information which they had collected, to spread through the world the advantages they had secured for the farming interest. There was no one there, he said, that could give them greater promise of future success than Mr. Pusey; and it was with joy that he delivered into his hands the position which he then occupied. He must thank the council before he sat down for the very zealous co-operation and kindness with which they had accepted his inadequate services (warm applause).

Mr. FISHER HOBBS, who had recently entered the room, thought the thanks of the Society were due to Mr. Jones, for the assistance he had rendered the society during the past year, and proceeded to warmly compliment that gentleman for the interest he had taken all along, and the exertions he had made to ensure the success of their present meeting. He expressed his opinion, that notwithstanding what had fallen from the chairman, that the Society could not do better than continue as heretofore, for he was satisfied that it was doing an immense amount of good, and that in the breeding of stock, and the selection of implements, the fears expressed by the noble chairman would not be realized.

Mr. LISTER MAW proceeded to address the council in a speech of considerable length, in which he expressed his concurrence in the remarks of the noble chairman as to the liability of highly-fed stock to degenerate; and he advocated the appointment of a veterinary surgeon, who should report upon the state of the animals exhibited at their show, and that these reports might appear in the Society's *Journal*, and so go forth to the world as a guide to farmers in the purchase of stock. He also expressed his opinion that many animals that had won prizes at the show were not in a healthy breeding condition; and having expressed his views with regard to machinery, and broaching other subjects, he paid a warm tribute to the memory of the late Earl Ducie, Earl Spencer, and Mr. Bates; and suggested, in conclusion, that a committee should be appointed to go through the proceedings of the Society since its foundation, with a view to recommending for general adoption what it has elicited and proved to be of advantage to the agriculturist and breeder, and to discard what had proved to be erroneous—such report to be published.

Mr. HUDSON promised to lay this suggestion before the Council.

Mr. W. JONES, who had not long entered the room, expressed his thanks to the meeting, and particularly to Mr. Fisher Hobbs, for their expression of regard towards him.

The CHAIRMAN explained that similar sentiments in acknowledgment of the valuable service rendered by Mr. Jones, had been expressed by previous speakers. With reference to the suggestion of Mr. Maw, he might inform that gentleman that such a digest of the Society's proceedings had been already published in the form of a paper, written by Mr. Pusey, and doubtless would form the subject of future similar papers.

The General Meeting then broke up, and the council proceeded to the despatch of their usual private business.

CATALOGUE OF IMPLEMENTS, &c., EXHIBITED AT THE SHOW.

THOMAS BIGG, Chemist, Leicester-house, Great Dover-street, Southwark, Surrey.

Three specimens of his sheep dipping apparatus, invented, improved, and manufactured by the exhibiter (this apparatus has obtained premiums and medals of the Highland and Agricultural Society of Scotland, of the Royal Improvement Agricultural Society of Ireland, and of the Yorkshire Agricultural Society).

JAMES DUNLOP, Haddington.

A bridle for cart or farm harness, and a neck collar for cart or farm harness, manufactured by the exhibiter; a saddle for cart or farm harness, improved and manufactured by the exhibiter; a breeching for cart or farm harness, a shaft belly-band for cart or farm harness, and a back band for plough harness, manufactured by the exhibiter; a neck collar for cart or farm harness, improved and manufactured by the exhibiter; and a hame strap, manufactured by the exhibiter.

OBED HUSSEY, Manchester.

A reaping machine (this invention received a silver medal at the Royal Agricultural Society's Meeting at Lewes, in 1852), a mowing machine (designed for reaping also), and (new implement) a pulverizer of the soil, and French digger, invented, improved, and manufactured by the exhibiter.

WILLIAM PROCKTER STANLEY, Peterborough, Northamptonshire.

Three specimens of Stanley's registered roller mill, invented, improved, and manufactured by the exhibiter (prizes were awarded to this mill at the Royal Society's Shows at York and Exeter, also at several local shows; a medal at the Royal Exhibition of 1851, also at the Society's Show at Lewes, and Peterborough, 1852); a Stanley's roller mill, a Stanley's oat, bean, linseed and malt mill, a Stanley's rape and linseed-cake breaker, three sizes of Stanley's registered farmers' steaming apparatus for cooking food for cattle, Stanley's improved chaff-cutting machine with patent lever, and Stanley's improved chaff-cutting machine, all invented, improved, and manufactured by the exhibiter; and a boiler for heating greenhouses and mansions, improved and manufactured by the exhibiter.

JOHN WOOD SHARMAN, Wellingborough, Northamptonshire.

Two sets of (an old implement, constructed on a new principle, and with new materials) hand hay or corn drag rakes, improved by the exhibiter, and manufactured by Warren Sharman, Melton Mowbray; and a pair of hay, stubble, or couch rakes, invented, improved, and manufactured by Warren Sharman, Melton Mowbray.

EDWARD and THOMAS HUMPHRIES, Pershore, Worcestershire.

A four-horse-power patent portable steam engine, and a five-horse-power portable steam engine, improved and manufactured by Clayton, Shuttleworth, and Co., Lincoln; a combined thrashing, straw-shaking, riddling, and winnowing machine, a self-feeding portable cider mill, a portable double cider press, a single cider press, and two pair of two-and-a-half inch wrought iron cider screws, with boxes, arms, and risers complete, all invented, improved, and manufactured by the exhibiters.

F. M'NEILL and Co., Patent Roofing Felt Works, Bunhill-row, London.

The patent asphalted felt for roofing houses and every description of farm buildings, improved and manufactured by the exhibiters; a portable rick stand, of a very cheap construction and an excellent check to vermin, invented by J. F. Williams, Patent Felt Works, Bunhill-row; and models and specimen framings, illustrating various cheap constructions of roofs for the application of the felt, also showing its use for ceilings, lining damp walls, covering flats, &c.

JAMES and A. ARMITAGE, Bury, near Ramsey, Huntingdonshire.

Two sizes of a brick and drain tile machine, invented, improved, and manufactured by the exhibiters.

Mr. W. SMITH, Kettering, Northamptonshire.

(New implement) an improved double-blasted winnowing machine, invented, improved, and manufactured by the exhibiter; (new implement) a newly-invented steerage horse-hoe, with double bar, invented and manufactured by the exhibiter; improved steerage horse-hoe with single bar, and (new implement) a newly-invented steerage corn drill with cups, invented, improved, and manufactured by the exhibiter; and an improved skim plough, invented and manufactured by the exhibiter.

RICHARD VICK, Gloucester.

A set of R. Vick's improved registered cart hames, to raise and lower the draft as required, a set of Scotch cart harness, complete with brass buckles, a set of Scotch harness, complete, with R. Vick's improved registered hames, set of G. O backbands, a set of best long cart harness, complete, a cart belly-band, a best saddle, complete, a cart headstall, with rein bit, &c., that may be used as a cart bridle, all manufactured by the exhibiter; and a set of best silver-mounted gig harness, with R. Vick's improved shifting hames, and newly improved fastenings.

RICHARD READ, 35, Regent Circus, Piccadilly, London.

A patent subsoil pulverizer (a prize of £10 was awarded for this implement at Southampton in the year 1844, at Shrewsbury in 1845, at Newcastle-on-Tyne in 1846, and at Northampton in 1847); and a double action agricultural fire-engine, complete, invented by the late John Read, and manufactured by the exhibiter; a patent agricultural fire-engine, and a patent watering-engine, invented, im-

proved, and manufactured by the exhibiter; a patent injecting instrument and tube complete for horses, cattle, &c. (this instrument was highly commended by the judges at the Lewes meeting, July, 1852), and a hollow probang for relieving hoven or choked cattle, &c., invented by the late John Read, of 35, Regent Circus, improved and manufactured by the exhibiter; a hollow probang for relieving hoven or choked sheep, calves, &c., two sizes of a patent hand watering machine (this machine was highly commended by the judges at the Lewes Meeting, July, 1852), and (new implement) a patent double action greenhouse pump, invented, improved, and manufactured by the exhibiter.

SAMUEL NYE and JOHN GILBERT, 79, Wardour-street, Soho, London.

(New implement) two sizes of a patent mincing machine, for mincing meat, vegetables, and other substances, invented and manufactured by the exhibiters.

WILLIAM CROSSKILL, the Beverley Iron Works, Beverley, Yorkshire.

Two specimens of a patent serrated clod crusher or wheel roller, invented, improved, and manufactured by the exhibiter (awarded the prize of £20 and silver medal at Southampton, £10 prize at Shrewsbury, the special award of the Council gold medal at Newcastle, and included in the award of the Council great medal at the Great Exhibition); (new implement, a new patent serrated roller with further improvements, (new implement) an old patent roller altered to the new patent improved roller; (new implement) a new patent roller with further patented improvements, invented, improved, and manufactured by the exhibiter; an improved Norwegian harrow, improved and manufactured by the exhibiter (awarded the head prize at the Royal York meeting, and included in the award of the Council great medal at the Great Exhibition); a Ducie drag harrow or Uley cultivator, invented by Mr. John Morton, of Whitfield, improved by Mr. Richard Clyburn, of Uley, and manufactured by the exhibiter (awarded the head prize of £45 by the Royal Agricultural Society); (new implement) a new horse rake, improved and manufactured by the exhibiter; a Hussey's American reaper, invented by Obed Hussey, of the United States, improved and manufactured by the exhibiter (at Lewes, in July, 185), the judges highly commended Hussey's reaper as made by W. Crosskill); (new implement) an improved reaping machine, invented, improved, and manufactured by the exhibiter; a Bell's reaper with latest improvements, invented by the Rev. Patrick Bell, of Scotland, improved and manufactured by the exhibiter (awarded a £20 prize by the Highland Society of Scotland at the Perth meeting last year, and at the challenge trial of £50 each at Keillor there appeared no competitor); (new implement) a mowing machine, a pair-horse improved waggon, invented, improved, and manufactured by the exhibiter (awarded the head prize of £10 at the Norwich meeting, also the head prize of £10 at the Exeter meeting, commended as the best waggon at the Great Exhibition in London); an improved pair-horse waggon, a "Newcastle" model one-horse cart and harvest cart (awarded the head prize at the Newcastle meeting), a "Great Exhibition" one-horse cart and harvest cart (awarded the Council great medal at the Great Exhibition), an improved one-horse cart, an improved one-horse cart and harvest cart, improved and manufactured by the exhibiter; a Norwich one-horse cart and harvest cart, improved by the Judges of the Royal Agricultural Society, and manufactured by the exhibiter (awarded the prize at the Royal Norwich meeting, also the prizes—for further improvements by Mr. Lister—at the Exeter and Lewes meetings); a "Newcastle" model one horse cart or Scotch harvest cart (awarded the head prize at the Newcastle meeting); an improved one-horse Scotch cart with sideboards, improved and manufactured by the exhibiter; two sets of patent cart wheels and axle, invented, improved and manufactured by the exhibiter; a set of cart wheels and axle, improved by Mr. Lister, of Dunsa Bank and manufactured by the exhibiter; three sets of patent cart wheels and axles, invented, improved and manufactured by the exhibiter; specimens of Crosskill's portable farm railway (awarded the honorary medal at the Royal Norwich meeting, and a second medal at the Exeter meeting), a package of farm railway for delivery, improved and manufactured by the exhibiter; an improved iron liquid manure cart or distributor, invented, improved, and manufactured by the exhibiter (awarded an honorary medal at the Royal Cambridge meeting); an improved iron liquid manure cart with watering apparatus complete; a fixture iron metal pump, with 12 feet of iron pipe and winbore, invented, improved, and manufactured by the exhibiter; an improved sanitary cart for town nightsoil, sweepings, &c., an improved two-horse portable thrashing machine; an improved portable four-horse thrashing machine, and an improved corn dressing machine and blower, improved and manufactured by the exhibiter; a three-horse and six-horse power patent eccentric mill (awarded the Council great medal at the Great Exhibition,) invented, improved, and manufactured by the exhibiter; and a patent iron fixture pig trough, invented by William Torr, Esq., of Aylesby, improved and manufactured by the exhibiter.

JOHN KEALY, 369, Oxford-street, London.

(New implement) a root cutter, invented by the exhibiter, improved by Evan Davis, of London, and manufactured by the exhibiter.

JOHN WHITEHEAD, Preston, Lancashire.

A No. 1 tile machine (Prizes were awarded for this machine at York, 1848, £20; at Norwich, 1849, £20; at Exeter, 1850, judges' commendation; Exhibition of All Nations, 1851, the prize medal; besides a number of prizes at local meetings); a No. 0 tile machine; a No. 2 or double box tile machine; (new implement) a patent socketing apparatus, and an improved brick making and pressing machine, invented, improved, and manufactured by the exhibiter; three rolls of hare proof netting, invented and manufactured by the exhibiter; (new implement) a new patent grubber, invented by Thomas and Henry Bleasdale, of Chipping, Lancashire, and manufactured by the exhibiter.

JAMES HAYES, Elton, near Oundle, Huntingdon.

Two sizes of a grinding mill, and a box of models of implements, invented and manufactured by the exhibiter.

FREDERICK JOHN WILSON, Esq., 32, Cadogan-place, London.

(New implement) a wheelbarrow, invented by the exhibiter, and manufactured by George Ell, of 3, Tottenham Court, New Road.

Messrs. HUNTER and ALLAN, Kelso, Roxburghshire.

A neck collar and hames, and (new implement) a cart saddle, invented by James Allan, of Kelso, and manufactured by the exhibiters.

GEORGE HURWOOD, of Ipswich, Suffolk.

A Hurwood's patent metal mill (B); a Hurwood's patent metal mill (A), and a Hurwood's patent metal mill (C), invented by the exhibiter, and manufactured by Ransome and Sims, of Ipswich (these mills obtained prize medals at the Great Exhibition, 1851; obtained the prize of £10 for the best grinding mill, at the Royal Agricultural Show at Lewes, 1852; obtained the medal of the Yorkshire Agricultural Society, 1852); a model plate and stand of Hurwood's patent metal mills; a Hurwood's patent metal mill (B), invented by the exhibiter, and manufactured by Ransome and Sims, of Ipswich; a specimen flour-dressing apparatus; a case containing specimens or models of Hurwood's patent ventilating windows (obtained honourable mention at the Great Exhibition, 1851), and a case containing various models in brass of Hurwood's patent window movements, invented and manufactured by the exhibiter.

RANSOME and SIMS, of Ipswich, Suffolk.

Several specimens of Ransome's patent iron plough, with two wheels, invented, improved, and manufactured by the exhibiters (awarded the prize of £7 at the meeting of the Royal Agricultural Society at Lewes, 1852, as the best plough for general purposes; also awarded the prize of £10, and silver medal, as the best light land plough, and also the prize of £10 and silver medal as the best heavy land plough, at the Royal Agricultural Society's meeting at Southampton; also a prize of £10 at the Royal Agricultural Society's meeting at Northampton; and the Council medal of the Great Exhibition, with this plough, as made by Busby); (new implement) a Ransome's patent Y.R.C. iron plough, fitted with cleaning apparatus; a Ransome's iron plough, with two wheels, invented, improved, and manufactured by the exhibiters; four specimens of Ransome's patent trussed-beam iron universal plough, marked Y.U.L., invented by J. Clarke, of Long Sut-

ton, and improved and manufactured by the exhibiters (obtained the silver medal at the meeting of the Royal Agricultural Society at Norwich, 1849); a Lowcock's patent iron one-way plough, with two wheels, and skim coulter, invented by H. Lowcock, of Westerland, and improved and manufactured by the exhibiters (obtained the prize of £5 at the Royal Agricultural Society's meeting at Southampton, a prize of £5 at Shrewsbury, a prize of £5 at Exeter, and a prize of £7, as the best turnwrest plough, at Lewes); a set of Ransome's patent trussed iron whippletrees, invented, improved, and manufactured by the exhibiters (obtained the Royal Agricultural Society's silver medal at Southampton, and commended at the Royal Agricultural Society's meeting at Lewes); a Biddell's patent wrought-iron scarifier, grubber, or cultivator, invented by A. Biddell, of Playford, and improved and manufactured by the exhibiters (this implement obtained the prize of £10 at the Royal Agricultural Society's meeting at Liverpool; also at Northampton, in 1846; at York, in 1848; at Norwich, in 1849; and at Lewes, in 1852); a registered Tennant's grubber, invented by J. Tennant, of Monkton, and improved and manufactured by the exhibiters; (new implement) two of Ransome's six-horse portable steam engines; a Ransome's four-horse portable steam engine; a Ransome's eight-horse stationary horizontal engine; a Ransome's five-horse stationary engine; a Ransome's four-horse portable thrashing machine; a Ransome's two-horse portable thrashing machine; a Ransome's portable bolting thrashing machine, on four-wheel carriage, with straw-shaker, collecting brushes, and riddle; a Ransome's improved portable or fixed six-horse bolting thrashing machine, with straw-shaker, riddle, blower, barley-awner, and elevator; a Ransome's dressing machine (large size); ditto, another size; a Ransome's barley awner, and a Ransome's chaff cutter (No. 14), invented and manufactured by the exhibiters; (new implement) Ransome's new horse power chaff engine, and ditto (No. 2), invented and manufactured by the exhibiters; a Gardner's turnip cutter for sheep, with grated hopper, and a Gardner's double action turnip cutter for sheep and beasts, invented by the late J. Gardner, of Banbury, improved and manufactured by the exhibiters; two sizes of Hurwood's patent twelve-inch metal mill (B), invented by George Hurwood, of Ipswich, and manufactured by the exhibiters (awarded the prize medal of the Great Exhibition, and the prize of £10 at the Royal Agricultural Society's meeting at Lewes; a Ransome's patent double mill (No. 8) for horse power (awarded the silver medal of the Royal Agricultural Society, at Lewes); a Ransome's patent double crushing mill, and a Ransome's patent double mill (No. 7), invented, improved, and manufactured by the exhibiters; (new implement) a Ransome's new bean cutter, for hard or soft beans; (new implement) a Ransome's new universal mill, and (new implement) a Ransome's new bruising mill, invented and manufactured by the exhibiters; a Ransome's oilcake breaker (No. 8), ditto (No. 1), and a Ransome's iron universal intermediate motion, invented, improved, and manufactured by the exhibiters; (new implements) two specimens of Atkins' patent automaton or self-raking reapers, invented by Jearum Atkins, of Chicago, U. S., improved and manufactured by the exhibiters; (new implement) a modification of the implement known as "Hussey's reaper," invented by Hussey, and improved and manufactured by the exhibiters; a Ransome's portable corn mill; a Ransome's improved one horse Scotch cart, complete, with harvest raves; a Ransome's improved Cumberland cart, with harvest raves, and a Ransome's one horse Windsor cart, invented, improved, and manufactured by the exhibiters; two sets of five circular-bottom pig troughs, improved and manufactured by the exhibiters; a circular pig trough, 2ft. diameter, with six partitions; ditto, 2ft. 9in. diameter, with eleven partitions, manufactured by the exhibiters; a nineteen-inch Budding's grass cutting machine, invented by Buddin, of Dursley, and manufactured by the exhibiters; a Ransome's circular-saw bench, invented, improved, and manufactured by the exhibiters; a model of Atkins' automaton self-raking reaper, and a model of Springall's corn-stack stand, improved and manufactured by the exhibiters; a Ransome's suspension harrow; a Ransome's No. 6 quarto copying press; a Ransome's patent iron plough with one wheel (marked Y.N.W.); a Ransome's patent iron double tom or moulding plough (marked W.I.C.W.), a Ransome's patent iron one-wheel plough (marked Y.I.W.); a Ransome's patent iron plough with one wheel (marked Y.C.P.); a Ransome's patent iron plough with one wheel (marked Y.C.H.), a Ransome's patent iron plough with one wheel (marked Y.F.S.), and a Ransome's patent iron plough called the Y hoe plough, invented, improved, and manufactured by the exhibiters; a patent iron Rackheath or subsoil plough, invented by Sir Edward Stracy, of Rackheath, improved and manufactured by the exhibiters; a patent iron plough, called the West Indian Y.W. trenching plough; an Indian horse hoe; a Ransome's patent Indian cultivator; an expanding horse hoe, and an Indian scuffler, invented, improved, and manufactured by the exhibiters; a Crosskill's patent clod crusher, 6ft. wide, invented by W. Crosskill, of Beverley, and manufactured by the exhibiters; a Ransome's patent cane top cutter; a Ransome's Sydney cart, and an iron chaff engine (No. 13), invented, improved, and manufactured by the exhibiters.

J. S. WRIGHT, Chicago, State of Illinois, United States of America.

Atkins's automation, or self-raking reaping machine, invented and manufactured by Jearum Atkins, of Chicago, Illinois, United States of America.

RICHARD GARRETT and SON, of Leiston Works, near Saxmundham, Suffolk.

A drill for general purposes, invented, improved, and manufactured by the exhibiters (prizes were awarded for this drill, at Liverpool, 1841, £10; at Derby, 1843, £30; at Southampton, 1844, £20 and a medal; at Northampton, 1847, £15; at Exeter, 1850, £10; and at the Great Exhibition of 1851 included in the award of the Council Medal); a drill for turnips and manure on the flat, improved and manufactured by the exhibiters (prizes were awarded for this drill at Cambridge, 1840, £10; at Northampton, 1847, £10: at York, 1848, £10; and at the Great Exhibition, 1851, included in the award of the Council Medal); a drill for turnips and mangel wurzel with manure on the ridge, improved and manufactured by the exhibiters (prizes were awarded for this drill at Bristol, 1842, £20; at Northampton, 1847, £10; and at Norwich, 1849, £10); a three-row economical drill for turnips, &c., with manure on the flat or ridge, invented and manufactured by the exhibiters (a prize of £5 was awarded for this drill at Lewes, 1852); a ten-row lever corn and seed drill, improved and manufactured by the exhibiters (a prize of £10 was awarded for this drill at Norwich, 1849); a nine-row lever corn and seed drill, invented and manufactured by the exhibiters (a prize of £10 was awarded at Exeter, in 1850, for this drill; and at Lewes, 1852, £5); a broadcast manure distributor, invented by H. E. Blythe, Esq., of Burnham, Norfolk, and improved and manufactured by the exhibiters (a prize of £5 was awarded for this machine at Lewes, 1852); a fifteen-row corn drill, improved and manufactured by the exhibiters; a patent drop drill for turnips and other seeds with manure on the flat or ridge (prizes were awarded for this drill at Norwich, 1849, £10; at Exeter, 1850, £10; and at Lewes, 1852, £10), and (new implement) a five-row turnip, mangold, and vegetable seed drill, invented, improved, and manufactured by the exhibiters; a fifteen-row lever corn and seed drill, and a thirteen-row lever corn and seed drill, improved and manufactured by the exhibiters; a No. 5 Garrett's patent horse hoe, invented, improved, and manufactured by the exhibiters (prizes were awarded for this implement, at Liverpool, 1841, 5*l.*; at Bristol, 1842, 10*l.*; at Derby, 1843, a medal; at Southampton, 1844, a medal; at Northampton, 1847, a medal; at York, 1848, a medal; at Norwich, 1849, 10*l.*; at Exeter, 1850, 10*l.*; at the Great Exhibition of 1851, Council Medal; and at Lewes, 1852, 10*l.*); (new implement) a patent revolving horse hoe, invented by Mr. Jno. Martin, of Barmer, near Fakenham, Norfolk, and manufactured by the exhibiters; a two horse power portable thrashing machine, invented and manufactured by the exhibiters (this machine obtained the prize of 10*l.* at the Lewes Meeting in 1852); a four-horse power open drum thrashing machine (this machine obtained the prize of 20*l.* at the Lewes Meeting in 1852); a four-horse power bolting thrashing machine (barn work) (prizes were awarded for this machine, at Newcastle, 1846, 25*l.*; at Northampton, 1847, 20*l.*; and at York, 1848, 20*l.*); a portable thrashing machine, fitted with straw shaker and screen, for steam power (prizes were awarded for this machine, at Norwich in 1849, 25*l.*; at the Great Exhibition in 1851, included in the award of the Council Medal); a portable thrashing machine, fitted with straw shaker, screen, and winnowing apparatus, for steam power, and

a fixed thrashing machine, fitted with straw shaker, screen, and winnowing apparatus, for steam power, all invented, improved, and manufactured by the exhibiters; (new implement) a corn dressing machine, fitted with a rotary corn separator, invented and manufactured by the exhibiters; a barley aveller or hummelling machine, improved by the exhibiters; a set of corn elevators with driving shaft and pulleys; an improved self-acting weighing apparatus; a six-horse power and five-horse power portable steam engine (the prize of 50*l.* was awarded for the latter engine at Norwich, and was included in the award of the Council Medal of the Great Exhibition of 1851); a five-horse power fixed steam engine; a chaff cutter for horse or steam power, and a chaff cutter for hand power, all improved and manufactured by the exhibiters; two rape and linseed cake crushers, improved by the exhibiters; a linseed, malt, and oat crusher, improved and manufactured by the exhibiters; a corn dressing machine, invented, improved, and manufactured by the exhibiters; a corn dressing machine, improved and manufactured by the exhibiters; a patent drain pipe and tile machine, invented by Richard Weller, of Capel Dorking, Surrey, and manufactured by the exhibiters (a prize of 5*l.* was awarded for this machine at Newcastle in 1846); (new implements) two sizes of Atkins's automaton or self-raking reaping machine, invented by Jearum Atkins, of Chicago, Illinois, United States, and manufactured by the exhibiters; an improved corn reaping machine, invented by Obed Hussey, of Baltimore, United States of America, and improved and manufactured by the exhibiters (this machine had a silver medal awarded it at Lewes, 1852); and a newly invented machine for turning cheese, registered and manufactured by John Strutt, Esq., Belper, Derbyshire.

WILLIAM BATLEY, of Bridge-street Works, Northampton.

A six-horse power portable steam engine on wheels, invented, improved, and manufactured by the exhibiter; a six-horse power portable thrashing machine, invented and manufactured by the exhibiter; and (new implement) a registered clover rubber, invented by John Rivett, of Brighton, and improved and manufactured by the exhibiter.

CHARLES BURRELL, of Thetford, Norfolk.

A six-horse power portable steam engine, and a portable thrashing, shaking, and riddling machine, improved and manufactured by the exhibiter; a circular saw bench or machine for making hurdles or gates, invented by Walter Palmer, of Southacre, and improved and manufactured by the exhibiter (awarded a silver medal at the Royal Agricultural Society's Meeting at Norwich, 1849); and a gorse cutter and bruiser and universal corn and seed crusher, improved and manufactured by the exhibiter (awarded a prize medal at the Great Exhibition, 1851).

M. JOSCELIN COOKE, of Newcastle-on-Tyne.

(New implement) a mill, acting horizontally and conically, invented and manufactured by the exhibiter; and a stand containing bottles and boxes as specimens of various artificial manures, chemical salts, and other substances used as manure, partly manufactured by the exhibiter.

ABRAHAM PRIDMORE and SON, Thorpe Satchville, near Melton Mowbray, Leicestershire.

(New implements) two double-blast winnowing machines for dressing all kinds of corn, invented, improved, and manufactured by the exhibiters, and (new implement) a rotary force pump and fire engine, invented by Mrs. Carrey, of Rockport, improved and manufactured by the exhibiters.

REV. SAMUEL SMITH, of Lois Weedon, Towcester, Northampton.

A drill for dropping wheat; a horse hoe and roller implement; a one horse scarifier, scuffler, or hoe; and a marking implement, invented by the exhibiter, and manufactured by William Gascoigne, of Weston-by-Weedon, Towcester.

WILLIAM SMITH, of Little Woolston, Fenny Stratford, Bucks.

(New implement) a patent reaping machine, invented and manufactured by the exhibiter; a registered subsoil plough, invented by the exhibiter, and manufactured by B. Samuelson, of Banbury; and a set of harness for the reaping machine, invented by the exhibiter, and manufactured by Chibnall Smith, of Newport-Pagnell.

JAMES CHADNOR WHITE, of Liverpool-street, Bishopsgate, London.

A set of pair horse carriage harness, with patent tugs, for which a prize medal was awarded at the Great Exhibition of all Nations; and a set of silver-mounted single brougham harness, invented, improved, and manufactured by the exhibiter; a set of plain gig harness; a set of brass and covered mounted gig harness; and a best light hunting saddle, manufactured by the exhibiter.

GRACE CHEALE and SONS, Southover, Lewes, Sussex.

A three-horse portable power thrashing machine; a two-horse power portable thrashing machine; a four-hand power thrashing machine; a one-horse power portable horse gear; a finishing corn-dressing machine; a round wrought-iron sheep crib; and a one-row turnip-drill, all improved and manufactured by the exhibiters.

JAMES COMINS, South Molton, Devonshire.

A plough for general purposes, or for deep ploughing; (new implement) a paring plough; two registered one-way turnover or turnwrest ploughs improved for earthing-up potatoes, ridging for turnips, &c.; two subsoil pulverizers; two sizes of a horse-hoe (this implement was awarded the Great Exhibition medal of 1851); a new pattern turnwrest plough; (new implement) a pair-horse cultivator, grubber, or scarifier (this implement was awarded the prize at the South Devon Agricultural Society's Meeting, in November, 1852); a cultivator, grubber, or scarifier; and (new implements) two patent clod-crushers, land-pressers, or pulverizers, all invented, improved, and manufactured by the exhibiter.

HARRY WINTON and SONS, Birmingham, Warwickshire.

Several sets of solid patent cast-steel digging forks, invented by Harry Winton and Francis Parkes, of Birmingham and Sutton; manufactured by the exhibiters; several sets of solid cast-steel dung-forks, manufactured by the exhibiters; several sets of steel-tine couch-grass, border, litter, shaking, cocking, hay, unloading, and pitching forks, manufactured by the exhibiters; several sets of bright cast-steel draining tools, manufactured by the exhibiters; several sets of cast-steel new pattern bright spades, London shovels, cast-steel shovels, cast-steel felling axes, hatchets, axes for general use, solid cast-steel hoes, garden hoes, turnip hoes, potato hoes, solid cast-steel hedge hooks, cast-steel hop becks, dung and sea-weed drags, cast-steel drill hoes, and cast-steel Prussian hoes, improved and manufactured by the exhibiters; (new implement) a set of patent elastic framed hoes; a set of bills; a set of pole or stock axes; a set of cleavers and choppers; a set of steel trowels; and a set of steel breast-plough blades, manufactured by Winton and Sons and Francis Parkes, of Birmingham and Sutton.

WILLIAM DRAY and Co, Swan-lane, London.

A six-horse power patent portable steam engine, invented by Messrs. Want and Vernum, and improved and manufactured by the exhibiters; a six-horse power fixed steam engine, invented and manufactured by the exhibiters; an eight-horse power patent fixed steam engine, invented by Want and Vernum, and manufactured by the exhibiters; two winnowing and blowing machines combined, and a winnowing machine, invented, improved, and manufactured by the exhibiters; a reaping machine, invented by Obed Hussey, of Baltimore, improved and manufactured by the exhibiters; (new implement) a draining plough, invented by the Earl of Dundonald, and manufactured by the exhibiters; a registered machine for riddling, blowing, and seed-separating, invented by J. Cornes, jun., and manufactured by the exhibiters; a one-row drill for turnips with manure; three registered chaff and litter cutters, and a registered chaff engine, invented, improved, and manufactured by the exhibiters; a chaff engine, invented and manufactured by the exhibiters; three specimens of a chaff engine, invented, improved, and manufactured by Richmond and Chandler, of Salford; (new implement) an oilcake breaker and bone mill, and (new implements) two corn bruisers or oat mills, invented and manufactured by the exhibiters; two sizes of a corn bruiser, invented and manufactured by Richmond and Chandler, of Salford; (new implement) a combined thrashing

and winnowing machine, portable, invented and manufactured by the exhibiters; a portable two-horse thrashing machine and horse gear, invented and manufactured by Barrett, Exall, and Andrews; a patent Vanlyke hand thrashing machine, invented and manufactured by Hensman and Son; a flax seeding machine, invented and manufactured by R. Robinson; (new implement) a churn, invented and manufactured by A. Willard; two specimens of a churn, invented by C. J. Anthony, of Pittsburgh, U. S., and manufactured by Burgess and Co. (this machine obtained the prize of the Royal Agricultural Society at Exeter in 1850, and the prize medal at the Great Exhibition in 1851;) a patent churn, invented by J. Dalphin, United States, America, and manufactured by the exhibiters; two Sussex churns, and a compound lever cheese press, manufactured by the exhibiters; a compound lever cheese press, invented and manufactured by the exhibiters; a set of three milk pans, manufactured by the exhibiters; a circular saw table, and (new implement) a machine for cutting and bruising gorse, invented and manufactured by the exhibiters; three American ploughs, manufactured by the exhibiters; a screw lifting jack, a grindstone with treadle, invented and manufactured by the exhibiters; three specimens of a patent iron plough with two wheels, invented and manufactured by J. and F. Howard, of Bedford; two sets of weighing machines, invented and manufactured by R. Forshaw and Co., of Liverpool; garden seats, and a wrought iron liquid manure pump, invented and manufactured by the exhibiters; two patent iron ploughs, with two wheels, invented and manufactured by Ransome and Co., of Ipswich; a patent force and suction pump, invented by Mr. Kase, United States, America, and manufactured by Samuelson, of Banbury; a set of draining tools, manufactured by the exhibiters; a Budding's patent lawn mowing machine, invented by Budding, manufactured by the exhibiters; a mangle for public use; two circular pig troughs; a long pig trough, and a washing machine, invented and manufactured by the exhibiters; an enamelled cast iron manger and water trough with rack, invented and manufactured by Cottam and Hallen, of London; an enamelled cast iron manger and water trough with rack, manufactured by the exhibiters; a portable engine for farm or gardening purposes, invented and manufactured by the exhibiters; a manger; a rack; and a trough manufactured of cast iron, manufactured by the exhibiters; six sets of Boyd's patent double action self-adjusting scythe, invented by J. Boyd, of London, and manufactured by the exhibiters; six sets of digging forks, manufactured by W. Lyndon; (new implement) several bundles of strong wire fencing, invented and manufactured by Musgrave and Co.; two bundles of galvanized wire netting for fencing, manufactured by the exhibiters; a bundle of steel spades, manufactured by W. A. Lyndon; three cast iron stack pillars, and a self-acting gate, invented and manufactured by the exhibiters; two Norfolk pig troughs, invented and manufactured by Barnard and Co.; a small grindstone, invented and manufactured by the exhibiters; and a galvanized iron pail, manufactured by the exhibiters.

GEORGE HARRIOTT, Frindsbury, near Rochester, Kent.

A clod crusher and universal roller, invented, improved, and manufactured by the exhibiter.

SCOULAR and Co., Flora Bank, near Haddington, East Lothian.

A light two horse grubber and ribbing machine, invented and manufactured by the exhibiters; a registered light two horse grubber, invented by J. Tennaut, of Shields, Ayrshire, and manufactured by the exhibiters; a two horse grubber, invented by J. Finlayson, of Ayrshire, in 1823, improved and manufactured by the exhibiters; a single horse lever grain drilling machine, improved and manufactured by the exhibiters.

SMITH and ASHBY, Stamford, Lincolnshire.

Two sizes of Smith and Ashby's patent improved double action haymaking machine, on Smith and Ashby's patent wrought iron wheels (prizes were awarded for this implement at the Royal Agricultural Society's meeting at Newcastle, 1846, £5; at the Great Yorkshire meeting, 1846, £5 5s.; at the Derbyshire meeting, 1846, £5 5s.; at the Great Yorkshire meeting, 1847, £5; at York, 1848, the Royal Society's medal; at the Great Yorkshire meeting, 1849, £3 3s.; at Norwich, 1849, £5, the Royal Society's prize for the best haymaker; at Exeter, 1850, the first prize of the North Lincolnshire Society, 1850; ditto, Royal North Lancashire, 1850; ditto, Great Yorkshire, 1850; at the Exhibition of All Nations, 1851, prize medal; at the Bath and West of England Society's meeting at Taunton, 1852, £3; and at the Royal Society's meeting at Lewes, 1852, the judges' commendation—no prize being offered that year); a Smith and Ashby's patent improved horse rake (received the prize medal of the Great Exhibition, and has taken thirteen prizes from various agricultural societies); a Smith and Ashby's patent lever wheel hand rake; a Smith and Ashby's Exhibition prize No. 1 patent chaff and litter cutter with two knives (received the prize medal of the Great Exhibition, 1851); a Smith and Ashby's Exhibition prize patent No. 3 chaff cutter with three knives; two of Smith and Ashby's new patent chaff cutters; a Smith and Ashby's improved prize cultivator, grubber, or scarifier, No. 2 (this implement was awarded at the meeting of the Royal Society at Newcastle, 1846, the prize medal; ditto at Norwich, 1849, £10; at the Great Yorkshire, 1849, £5 5s; at the Exeter meeting of the Royal Agricultural Society, 1850, £10; at the Great Yorkshire, 1850, £5; the prize of the Royal North Lancashire, 1850; and at the Great Yorkshire, 1852, £5); a Smith and Ashby's patent park or luggage cart; a Smith and Ashby's newly invented one-horse cart for harvest work and general purposes; a Smith and Ashby's improved patent one and two horse cart, and a sample of Smith and Ashby's patent wrought iron wheels and axles—all the implements on this stand were invented, improved, and manufactured by the exhibiters.

RICHARD BACH and Co., Birmingham, Warwickshire.

A four horse power portable steam engine, and a four horse power fixed steam engine, invented, improved, and manufactured by the exhibiters.

HENRY BRINSMEAD, of St. Giles, near Torrington, Devonshire.

(New implement) a patent reaping machine, and (new implement) a patent straw shaker, invented and manufactured by the exhibiter.

JOHN WRAY, of Leeming, near Bedale, Yorkshire.

A grass-mowing and reaping machine, invented and manufactured by the exhibiter.

RICHARD HORNSBY and SON, of Spittlegate Iron Works, Grantham, Lincolnshire.

Two specimens of a six-horse power improved patent portable steam-engine, invented, improved, and manufactured by the exhibiters (the first of these engines received the council medal of the Great Exhibition of the Industry of All Nations held at the Crystal Palace, Hyde Park, London; likewise the first prize of £40 as the best and most economical engine exhibited at the meeting of the Royal Agricultural Society of England held at Lewes, July, 1852; £50 at the Royal meeting held at Exeter, July, 1850; also the first prize of £50 at the Royal meeting held at York, July, 1848); a five-horse-power improved patent portable steam-engine; an eight-horse-power horizontal fixture steam-engine; an improved patent portable united thrashing, shaking, and dressing machine; a four-horse-power portable thrashing machine; a patent corn-dressing and winnowing machine (this machine received the council medal at the Great Exhibition of the Industry of All Nations, held at the Crystal Palace, Hyde Park, London; also the first prize of £10 at the meeting of the Royal Agricultural Society of England held at Lewes, July, 1852; £10 at the Royal Society's meeting at Exeter, July, 1850; £10 at the Royal Society's meeting at Norwich, July, 1849; £10 at the Royal Society's meeting at York, July, 1848; and £3 at the Royal Society's meeting at Newcastle, 1846); an improved corn-dressing and winnowing machine; a drill machine for corn and general purposes (this drill machine received the first prize of £10 as the best exhibited at the meeting of the Royal Agricultural Society of England held at Lewes, July, 1852; £15 at the Royal meeting held at Norwich, July, 1849; £15 at the Royal meeting at York, July, 1848; £15 at the Royal meeting at Newcastle-upon-Tyne, July, 1846; £15 at the Royal meeting at Shrewsbury, July, 1845; £10 at the Royal meeting at Derby, July, 1843; £30 at the Royal meeting at Bristol, July, 1842; and £25 at the Royal meeting at Liverpool, July, 1841); a patent corn and seed drill on an improved principle (this drill received the council medal at the Great

Exhibition of the Industry of All Nations held at the Crystal Palace, Hyde Park, London; likewise the first prize of £10 as the best exhibited at the meeting of the Royal Agricultural Society of England at Lewes, July, 1852; and £10 at the Royal Society's meeting at Exeter, July, 1850); an improved patent forecarriage steerage; a patent drill for turnips or mangel-wurzel seed with manure (this drill received the first prize of £10 as the best exhibited at the meeting of the Royal Agricultural Society of England held at Lewes, July, 1852; £10 at the Royal meeting at Exeter, July, 1850; £10 at the Royal meeting at Norwich, July, 1849; £10 at the Royal meeting at Shrewsbury, July, 1845); a two row patent ridge drill for turnips or mangel-wurzel seed and manure (this drill received the council medal at the Great Exhibition of the Industry of All Nations held at the Crystal Palace, Hyde Park, London; also the first prize of £10 as the best exhibited at the meeting of the Royal Agricultural Society of England held at Lewes, July, 1852; £10 at the Royal meeting at Exeter, July, 1850; the prize medal at the Royal meeting at Norwich, July, 1849; £10 at the Royal meeting at York, July, 1848; £10 at the Royal meeting at Shrewsbury, July, 1845; the prize medal at the Royal meeting at Derby, July, 1843; £10 at the Royal meeting at Liverpool, July, 1841); a patent drop drilling machine for ridges or flat ground (this drill received the council medal at the Great Exhibition of the Industry of All Nations, held at the Crystal Palace, Hyde Park, London); a patent small occupation corn drill; an improved drill machine for distributing pulverized manures broadcast (this drill received the prize of £10 as the best broadcast manure distributor exhibited at the meeting of the Royal Agricultural Society of England, held at York, 1848); a double cake-breaking or crushing machine (it received the council medal at the Great Exhibition of the Industry of All Nations held at the Crystal Palace, Hyde Park, London; it also had the prize of £5 awarded to it as the best exhibited at the meeting of the Royal Agricultural Society of England held at Lewes, July, 1852; £5 at the Royal Society's meeting held at Shrewsbury, July, 1845; £5 at the Royal Society's meeting at Southampton, July, 1844; and £5 at the Royal Society's meeting at Derby, 1843); a single cake-breaking or crushing machine; a blower machine or corn rectifier, and a barley horner, all invented, improved, and manufactured by the exhibiters.

THOMAS BEALE BROWNE, of Hampen, near Andoversford, Gloucestershire.

(New implement) a clod-crusher and pulverizer, and (new implement) a Cotswold plough, invented and manufactured by the exhibiter; a first-rate tarpaulin with patent œilet-holes; a four-bushel sack; a five-bushel sack, a waggon cloth, and a flax tube to convey liquids, invented by the exhibiter, and manufactured by Messrs. Waithman and Co., of Bentham Mills, Lancaster; and samples of flax and flax-seed, grown by the exhibiter.

THOMAS SCRAGG, of Calveley, near Tarporley, Cheshire.

A single-action tile machine, invented, improved, and manufactured by the exhibiter (this machine obtained the prize of £20 at the Lewes meeting in 1852); a specimen of hollow bricks, invented by the exhibiter; and a specimen of bell-mouthed drain pipes.

WILLIAM BALL, of Rothwell, near Kettering, Northamptonshire.

Seven different specimens of an iron plough (a prize of £5 was awarded to this plough for general purposes at the Royal Agricultural Society's meeting at Norwich, 1849; a prize of £7 at Exeter, 1850; also a prize medal at the Great Exhibition of All Nations, 1851); an improved steerage drill with newly-invented horse hoes attached; a light waggon for two horses (this waggon obtained a prize of £5 at the Royal Agricultural Society's meeting at Lewes, 1852); a one-horse cart for general purposes, and a pair-horse scarifier, invented, improved, and manufactured by the exhibiter; and a set of whipple-trees for plough.

WILLIAM EAST, of Spalding, Lincoln.

(New implement) a patent dropping machine, and (new implement) a patent hand dropping machine, invented and manufactured by the exhibiter.

JAMES and FREDERICK HOWARD, Bedford.

Four specimens of a patent iron plough with two wheels, invented and manufactured by the exhibiters (prizes awarded by the Royal Agricultural Society of England to Howard's patent ploughs: The first prize of £5 at the Liverpool meeting; the first prize of £5 at the Bristol meeting; the first prize of £10 at the Shrewsbury meeting; a double first prize of £20 at the Newcastle meeting; also at Northampton, 1847, at York, 1848, at Norwich, 1849, and at Exeter, 1850, the first prizes were awarded to the exhibiters for the best plough; and at Lewes, 1852, the Society's medal was awarded; the prize medal was also awarded at the Great Exhibition); a patent iron swing plough, and several patent iron ploughs, with two wheels, invented and manufactured by the exhibiters; a patent double furrow plough; an improved iron Kentish turnwrest plough; two improved Northumberland ridge or double breast ploughs, and a new patent subsoil plough or sub-pulverizer, invented and manufactured by the exhibiters; a Read's patent iron subsoil plough or sub-pulverizer, invented by the late John Read, of London, improved and manufactured by the exhibiters (the Royal Agricultural Society has awarded the following premiums to this implement: The first prize of £10 at the Southampton meeting, in 1844; the first prize of £10 at the Shrewsbury meeting, 1845; the first prize of £10 at the Newcastle-on-Tyne meeting, in 1846; the first prize of £10 at Northampton; and the first prize of £5 at the Exeter meeting, 1850, was awarded to the exhibiters for their improvements in this plough); nine different sets of new patent jointed iron harrows, with whippletrees, invented by James Howard and W. Armstrong, of Bedford, and manufactured by the exhibiters (the Royal Agricultural Society of England has awarded to the exhibiters the following premiums for harrows: Derby meeting, 1844, first prize of £5; York meeting, 1848, first prize of £5; Exeter meeting, 1850, first prize of £5; and the first prize of £5 at the Lewes meeting, 1852); a wrought iron scarifier or cultivator, improved and manufactured by the exhibiters; a set of improved trussed whippletrees, invented by Egerton Harding, Esq., of Oldsprings, and improved and manufactured by the exhibiters; a set of improved equalizing whippletrees, and a set of improved steelyard whippletrees, improved and manufactured by the exhibiters; two improved iron horse hoes, invented and manufactured by the exhibiters (the Royal Agricultural Society awarded the first prize to this implement at the Lewes meeting, 1852); a patent horse rake, invented and manufactured by the exhibiters (the Royal Agricultural Society awarded the prize to this implement at Exeter, 1850, and again at Lewes, 1852; at the Great Exhibition of All Nations, Messrs. Howard also gained the prize medal for this implement); a patent horse rake, with sowing machine or seed drill attached, invented and manufactured by the exhibiters; an improved Bedfordshire one horse cart; and specimens of shares for ploughs, and sundry models of implements.

JOSEPH SIMMONS, Sittingbourne, Kent.

(New implement) a five-furrowed drill, and a barrow drill, invented, improved, and manufactured by the exhibiter; a turn-wrest plough, invented and improved by W. Smart, Esq., of Rainham, and manufactured by the exhibiter.

BENJAMIN WRIGHT, St. Nicholas, near Cardiff, Glamorganshire.

A lever horse rake, invented, improved, and manufactured by the exhibiter; a one-row turnip and mangel-wurzel drill, for ridge work; and an expanding horse hoe, to follow the turnip drill, improved and manufactured by the exhibiter; a sheep hurdle, 6 feet long, five bars, three uprights, a strong sheep hurdle, 7 feet long, five bars, four uprights, and a strong sheep-folding hurdle, 12 feet long, invented, improved, and manufactured by the exhibiter.

BARNARD and BISHOP, Norwich, Norfolk.

Several specimens of strong wrought iron garden chairs, garden seats, and garden stools, improved and manufactured by the exhibiters; several triangular cast iron troughs for poultry and dogs, invented and manufactured by the exhibiters; a pheasant feeder, manufactured by the exhibiters; several rolls of light galvanized wire netting, of different mesbes, invented and manufactured by the exhibiters; an improved wrought iron standard, for strained wire fencing,

several descriptions of iron hurdles, several specimens of double and single Norfolk pig-troughs, made of cast and wrought iron, (new implement) a wrought iron sheep-trough, and (new implement) a galvanized iron sheep-trough, invented and manufactured by the exhibiters; two sizes of wrought iron bedstead, with dovetail joints, and a wrought iron portable or folding bedstead, improved and manufactured by the exhibiters; a cottage mangle, invented and manufactured by the exhibiters; a patent self-rolling mangle, invented by Charles Barnard, of Norwich, and manufactured by the exhibiters; four different sizes of cast iron window frames and casements, and three wire net tree guards, invented and manufactured by the exhibiters; a roll of ornamental garden border, and several specimens of wrought iron garden gates, manufactured by the exhibiters; two wrought iron ornamental carriage gates, designed and manufactured by the exhibiters; three different field gates, invented and manufactured by the exhibiters; two rick-stand pillars, of wrought and cast iron, improved and manufactured by the exhibiters; a circular wrought iron rick stand, invented and manufactured by the exhibiters; a wrought iron sheepfold hurdle, on wheels, and a barrow wheel, improved and manufactured by the exhibiters.

MAPPLEBECK and LOWE, Birmingham, Warwickshire.

An iron meadow or gravel roller, of wrought iron, strongly braced, and wood shafts, the spindle fitted to run in brass bushes, and two iron field rollers, 18in. diameter, manufactured by the exhibiters; an improved patent corn dressing machine, invented by the late John Cooch, and manufactured by Joseph Cooch, of Harleston (this machine obtained the prize of £10 at the Liverpool meeting of the Royal Agricultural Society, also the prize of £16 at the Northampton meeting of the same society); a patent corn dressing or winnowing machine, invented and manufactured by R. Hornsby and Son, of Grantham (this machine has taken the prizes offered by the Royal Agricultural Society of England at Newcastle-on-Tyne, 1846; York, 1848; Norwich, 1849; Exeter, 1850; and Lewes, 1852); an improved corn dressing or winnowing machine; two chaff cutters; and a two knife chaff engine, manufactured by the exhibiters; a chaff engine, invented and manufactured by Ransome and Sims, of Ipswich; three specimens of a two knife chaff engine, invented by John Cornes, improved and manufactured by James Cornes, of Barbridge (this machine gained the prize of the Royal Agricultural Society of England at the Lewes meeting, 1852); an improved oilcake breaker, manufactured by the exhibiters: an improved oilcake breaker, invented, improved, and manufactured by R. Hornsby and Son, of Grantham; three specimens of a portable kibbling mill on a stand; a portable bean mill on a stand; a portable malt mill on a stand; and a portable kibbling machine on a stand, manufactured by the exhibiters; a patent turnip cutter, invented by the late James Garduer of Banbury, and manufactured by the exhibiters (a silver medal was awarded to Mapplebeck and Lowe for this turnip cutter at the Northampton meeting of the Royal Agricultural Society); a patent root grater, invented and manufactured by E. H. Bentall, of Heybridge; a patent hay maker on patent wrought wheels, invented, improved, and manufactured by Smith and Ashby, of Stamford (this implement has, from its first exhibition, obtained all the prizes of the Royal Agricultural Society); a patent horse or drag rake, invented, improved, and manufactured by J. and F. Howard, of Bedford (the Royal Agricultural Society awarded a prize to this implement at Exeter, 1850, and at Lewes, 1852); a Newcastle model one horse cart, with harvest shelvings, complete; and a patent serrated roller, or clod crusher, invented, improved, and manufactured by W. Crosskill, of Beverley; nine different sizes of a platform weighing machine, of improved construction, and a steelyard, with frame for weighing sacks, &c., invented and manufactured by W. T. Avery, of Birmingham: a set of new pattern iron weights, manufactured by the exhibiters; four different sizes of a patent lawn mowing machine, invented by E. Budding, improved and manufactured by Ferrabee and Sons, of Stroud; two strong wrought iron garden chairs, manufactured by the exhibiters; a wrought iron folding garden stool, with elastic galvanized wire seat; four different sizes of an iron garden roller; a patent mangle; a linen press; and a portable bed for farm servants and emigrants, manufactured by the exhibiters; a set of patent draining tools, and a set of patent pipe draining tools, invented by Josiah Parkes, of London, and manufactured by W. A. Lyndon, of Birmingham (the prize of £5 was awarded to the exhibiters for these tools at the Northampton Meeting of the Royal Agricultural Society, 1847; also the prize at Lewes, 1852); four other sets of patent draining tools, manufactured by W. A. Lyndon, of Birmingham; two sets of bright draining tools for clay land, manufactured by the exhibiters (these tools obtained the prize of £3 at the Norwich meeting of the Royal Agricultural Society, 1849, and £3 at the Exeter meeting of the Royal Agricultural Society, 1850; nine bundles of five-prong solid steel digging forks, manufactured by F. Parkes, of Stone House Forge; a bundle of three-prong extra strong steel digging forks, manufactured by W. A Lyndon, Birmingham; several bundles of cast-steel hay forks; bright steel unloading forks; bright steel pitching forks, and solid cast-steel border or weeding forks; two bundles of solid cast-steel border or weeding forks; two bundles of solid cast-steel spades with straps; and a bundle of steel spades, manufactured by F. Parkes, of Stone House Forge; a bundle of Lyndon's patent spades and shovels, manufactured by W. A. Lyndon, Birmingham; a bundle of bright spades, manufactured by the Brades Company, of Birmingham; a bundle of shovels, manufactured by F. Parkes, of Stone House Forge; set of hoes of various kinds, manufactured by Hunt and Co., and others; a set of rakes of various kinds, manufactured by the exhibiters and others; a set of bill hooks, of various patterns, manufactured by Thomas and others; a set of hedging and brushing hooks, &c., sickles and reaping hooks, sheep and horse shears, grass, garden, and hedging shears, farm labourer's tools, cottager's allotment tools, hay-making tools, weeding tools, guttering and floating tools, breast ploughs and turfing irons, hay knives, and emigrant's tools, manufactured by the exhibiters; an improved garden engine; an iron sack cart; a sack cart with wood frame; several rolls of hare, rabbit, or poultry wire netting; a set of poultry troughs; four galvanized hay racks; four hay racks; two corner mangers; two galvanized corner mangers, and three flat mangers, manufactured by the exhibiters; two enamelled mangers for corners, and an enamelled manger, manufactured by Clarke and Co., of Wolverhampton; a set of stall posts and rails, with trapped drain; an improved rack and manger, and several cattle and pig troughs, manufactured by the exhibiters; an improved portable forge, manufactured by Onions, of Birmingham; an improved lever cheese press and a chain barrow, manufactured by the exhibiters; two specimens of an improved one-row horse hoe, invented and manufactured by J. and F. Howard, of Bedford; an improved wrought-iron scarifier, with seven coulters, manufactured by the exhibiters; an improved wrought-iron scarifier, with seven coulters, manufactured by J. and F. Howard, of Bedford; two specimens of Bentall's patent broadshare and subsoil plough, invented and manufactured by E. H. Bentall, of Heybridge; three sets of patent iron harrows, invented by W. Armstrong and J. Howard, of Bedford, and manufactured by J. and F. Howard, of Bedford; four sets of improved trussed whippletrees, invented by Mr. Harding, of Oldsprings, and manufactured by the exhibiters; a patent iron plough, with two wheels, invented and manufactured by Ransome and Sims, of Ipswich; three patent iron ploughs with two wheels, invented and manufactured by J. and F. Howard, of Bedford, and a stand of models.

WILLIAM COLBORNE CAMBRIDGE, Bristol, Gloucestershire.

A portable five-horse power steam engine; a portable bolting thrashing machine five-horse power; a patent portable four-horse power horse-work; a portable four-horse power thrashing mill or machine; eleven specimens of a patent press-wheel roller or clod crusher, and a patent wheel roller or clod crusher, all invented, improved, and manufactured by the exhibiter.

HUGH CARSON, of Warminster, Wilts.

A seven-share scarifier, invented, improved, and manufactured by the exhibiter; (new implement) a three share paring plough and five-share scarifier, invented and manufactured by the exhibiter; a cross-cut clod presser and wheel roller, and a sixteen-inch field roller, invented, improved, and manufactured by the exhibiter; a wrought-iron one wheel plough for strong land, and one for light land, improved and manufactured by the exhibiter; a wrought-iron scuffling plough and horse hoe, invented, improved, and manufactured by the exhibiter; a set of six wrought-iron harrows, invented and manufactured by

the exhibiter; a patent turnip cutter, invented by Edmund Moody, late of Maiden Bradley and improved and manufactured by the exhibiter; an oil-cake crusher, improved and manufactured by the exhibiter; a linseed, malt, and oat bruiser, invented, improved, and manufactured by the exhibiter; a chaff and litter engine, improved and manufactured by the exhibiter; three specimens of a chaff-cutting engine, invented and manufactured by the exhibiter; a double cheese press, and a single cheese press, improved and manufactured by the exhibiter.

ALBERT WENTWORTH CONNER (as Superintendent of Patent Brick and Tile Machine Company), 12, Eastcheap, London, Middlesex.

(New implement) a patent portable brick machine, and two sizes of (new implement) a patent double-actioned hollow brick and tile machine, invented by James Hart, of London, and manufactured by Andrew Handyside, of Britannia Foundry, Derby.

JOHN GILLAM, Woodstock, near Oxford.

(New implement) a machine for cleansing and separating rye grass, flax, and cinquefoil seed, invented by the exhibiter, and manufactured by Barrett and Exall, of Reading, Berks.

CHARLES HART, the Vale of White Horse Iron Works, near Wantage, Berkshire.

(New implement) a five-horse patent combined steam thrashing, shaking, riddling, winnowing, and dressing machine; different Berkshire cultivators from three to nine tine (one of these gained a prize of 5*l.* at the Lewes Meeting of the Royal Agricultural Society in 1852), an improved iron horse hoe for hoeing on the ridge or flat, and an improved liquid manure and water cart, all invented, improved, and manufactured by the exhibiter.

GEORGE HANCOCK, of Sandbach, Cheshire.

A double-action centrifugal churn, invented by Thomas Hancock, of Wistaston, Cheshire, and manufactured by the exhibiter.

CARRETT, MARSHALL, and Co., of Sun Foundry, Dewsbury-road, near Leeds, Yorkshire.

An improved (with new application) portable steam engine and irrigating apparatus, invented and manufactured by the exhibiters.

A. W. GOWER and SON, of Market Drayton, Salop.

A thirteen-coulter corn drill, invented by the late Mr. Smyth, of Peasenhall, Suffolk, and improved and manufactured by the exhibiters; a seven-coulter corn drill for small occupations, invented by Andrew Gower, of Market Drayton, and improved and manufactured by the exhibiters; two specimens of a turnip and mangel wurzel drill for two ridges; a two-ridge drill for beans, peas, turnips, and mangel wurzel, and a two-knife chaff engine, all invented and improved by Andrew Gower of Market Drayton, and manufactured by the exhibiters.

WILLIAM HENSMAN, and SON, of Woburn, Beds.

A patent eight-row steerage corn and turnip drill (a silver medal was awarded to this drill at the York Meeting, 1848, and a prize medal at the Great Exhibition of 1851); a one-horse power patent thrashing machine; a four-horse power ditto; a four-horse power portable patent bolting thrashing machine (the prize of 20*l.* was awarded to this machine at the Exeter Meeting, July, 1850, also a prize medal at the Great Exhibition, 1851); a two-horse power patent portable thrashing machine, and a patent hand thrashing machine, all invented, improved, and manufactured by the exhibiters.

THOMAS HUCKVALE, of Choice-hill, near Chipping Norton, Oxfordshire.

(New implement) a sample of patent beta to be used as a beverage; (new implement) a set of patent instruments for administering medicine to horses and other animals, invented and manufactured by the exhibiter; (new implement) a hand hoe for corn and turnips, invented by Francis Huckvale, of Choice-hill, and manufactured by the exhibiter; a patent horse hoe and turnip thinner on the ridge, invented and manufactured by the exhibiter (a prize of 3*l.* was awarded to this implement at Liverpool in 1841); two specimens of a patent liquid manure drill for root crops, invented, improved, and manufactured by the exhibiter (a prize of 5*l.* was awarded to this implement at the Derby meeting in 1843).

OLIVER MAGGS, of Bourton, near Wincanton, Somerset.

A four-horse power portable thrashing machine, and a three-horse power ditto, invented, improved, and manufactured by the exhibiter; an improved double screw and lever cheese press, and an improved single screw and lever ditto, invented by Daniel Maggs, of Bourton, improved and manufactured by the exhibiter; a five-tine Uley cultivator, invented by John Morton, of Whitfield, improved by M. R. Clyburn, of Uley, and manufactured by the exhibiter; two specimens of an improved iron plough for general purposes, improved and manufactured by the exhibiter; and an improved hay machine, invented and manufactured by the exhibiter.

THOMAS PREECE, of West-street, Leominster, Herefordshire.

A horse rake with a turnip drill, invented and manufactured by the exhibiter; and a horse hoe, improved and manufactured by the exhibiter.

ROBERT and JOHN REEVES, Bratton, near Westbury, Wiltshire.

Two specimens of a four or five row patent liquid manure and seed drill, invented by Mr. Thomas Chandler, of Aldbourn, Berks, improved and manufactured by the exhibiters (a silver medal was awarded to this machine at York, 1848, the prize for the best liquid manure distributor at Norwich, 1849, ditto at Exeter, 1850, and a prize medal at the Great Exhibition, 1851); a three row patent liquid and seed drill, and a stand of models.

WILLIAM TASKER and GEORGE FOWLE, Waterloo Iron Works, near Andover, Hampshire.

(New implement) a liquid manure drill; and a convex wheel roller and clod crusher, invented and manufactured by the exhibiters.

THOMAS ALLCOCK, Radcliffe-upon-Trent, near Nottingham.

(New implement) a cultivator, grubber, or scarifier, invented, improved, and manufactured by the exhibiter; (new implement) a barley awner; a chaff cutter with three knives; a ditto with two knives; two sets of circular wrought iron harrows; an iron plough with two wheels, and a horse drag rake, all invented and manufactured by the exhibiters.

GEORGE BELL, Inchmichael, near Errol, Perthshire.

A drill for general purposes, invented by the exhibiter, manufactured by Mr. William Watson, of Errol, Perthshire.

JAMES SMYTH and SONS, Peasenhall, near Yoxford, Suffolk, and Witham, Essex.

A patent turnip and mangold wurzel seed and manure drill; a patent ridge or broad work drill (this drill was awarded a prize of 10*l.*, and a silver medal, at Southampton, in 1844); a patent three-rowed ridge or broad work turnip and mangold wurzel seed and manure lever drill; a patent four-rowed turnip and mangold wurzel seed and manure drill; a patent five-rowed turnip and mangold wurzel seed and manure drill for ten-furrow work; a patent general purpose manure drill (for this drill a prize of 10*l.* was awarded at the Royal Agricultural Society of England's meeting at Liverpool, in 1841); a patent turnip and ridge drill for three rows; (new implement) a patent manure distributor; a patent five-rowed turnip and mangold wurzel seed drill; a patent Suffolk lever corn drill; a patent nine-rowed, ten-rowed, eleven-rowed, twelve-rowed, and thirteen-rowed Suffolk lever corn drill with cloverseed sowing machine attached; a patent thirteen-rowed, fourteen-rowed, and fifteen-rowed Suffolk lever corn drill; a patent eight or ten furrow Suffolk lever corn drill, all invented, improved, and manufactured by the exhibiters; and (new implement) a patent broadcast seed sowing machine, invented by Captain Kammerer, of Prussia, improved and manufactured by the exhibiters.

BURGESS and KEY, 103, Newgate-street, London.

A patent reaper, invented by Cyrus Hall M'Cormick, of Chicago, United States, and manufactured by B. Samuelson, of Banbury (this implement received the Council Medal, Great

Exhibition, 1851; first prize, North Lancashire Agricultural Society, 1851; first prize at the East Cumberland Agricultural Society, at Carlisle, 1851; first prize at the Great Yorkshire Show at Sheffield, 1852; first prize at Durham, 1852; award of the Driffield Farmers' Club, 1852; the award of the Jury appointed at the nine days' trial with Garrett's machine—on Hussey's principle—at the Royal Agricultural College at Cirencester, September, 1852); a four-horse power portable steam engine, improved and manufactured by Martin Samuelson, and Co., of Hull; a portable force and lift pump, for liquid manure, invented by Robert Urwin, of London, and manufactured by the exhibiters; two force and lift pumps, or farm fire engines, invented by Kase, of America, improved and manufactured by the exhibiters; a gutta percha pump, improved and manufactured by the Gutta Percha Company, London; two galvanized iron lift pumps, and a copper lift pump, improved and manufactured by the exhibiters; six different sizes of a patent churn (American), invented by C. J. Anthony, of Pittsburgh, United States, improved and manufactured by the exhibiters (this churn has received prizes at various agricultural meetings, and also at the Great Exhibition, 1851; a patent churn (American), invented by C. J. Anthony, of Pittsburgh, United States, improved and manufactured by the exhibiters; a model churn; and a patent turnip slicer, invented by Wm. Burgess, of Newgate-street, improved and manufactured by the exhibiters; a patent double action turnip cutter, invented by the late James Gardner, of Banbury, improved by Alexander Samuelson, of Banbury, and manufactured by B. Samuelson, of Banbury; three sizes of a registered tooth roller chaff cutter, improved and manufactured by Richmond and Chandler, of Manchester; a chaff cutter, improved and manufactured by Williams, of Bedford; a bean and oat mill, improved and manufactured by Richmond and Chandler, of Manchester; a grain cradle, invented by J. G. Grant, of Junction, United States; a new portable gas apparatus, invented by Mr. Turner, of London, improved and manufactured by the exhibiters; several bundles of digging forks of different tines; two complete sets of draining tools, and two bundles of hay forks; a bundle of pitching forks; and two bundles of steel spades, invented by Parkes, of Birmingham, improved and manufactured by Winton and Sons, of Birmingham; a bundle of tools (various); a sawing and boring table, manufactured by B. Samuelson, of Banbury; three American ploughs, invented and manufactured by Mr. Starbuck, of the United States; three bundles of Burgess and Key's patent corrugated and flexible gutta percha tubing, invented by W. Burgess, of London, and manufactured by the Gutta Percha Company; several bundles of gutta percha tubing, manufactured by the Gutta Percha Company; three lengths of corrugated suction (covered), invented by W. Burgess, of London, and manufactured by the Gutta Percha Company; several rolls of canvas hose, woven without seam; three rolls of canvas hose, coated and lined with gutta percha, invented by W. Burgess, of London, and manufactured by the exhibiters; a roll of common hose, coated; several rolls of common hose, coated; a set of gutta percha union joints; and two gutta percha jets and spreaders, manufactured by the Gutta Percha Company; two brass jets and spreaders, manufactured by Tyler and Sons; a set of gutta percha pails, gutta percha flat bands, and gutta percha round bands, manufactured by the Gutta Percha Company; a set of leather bands, and a roll of patent driving bands, manufactured by Hepburns, of London; a self-adjusting scythe, invented by Mr. Boyd, and manufactured by Messrs. W. Dray and Co., of London; a sack holder, manufactured by Richmond and Chandler; a patent lawn mower, improved and manufactured by B. Samuelson, of Banbury; two patent cart covers, manufactured by Waitman and Co., of Lancaster; and two bundles of sacks for corn, &c.

Bernhard Samuelson (Successor to the late James Gardner), Banbury, Oxfordshire.

Six different sizes of Samuelson's patent Gardner's turnip cutter (double action), invented by the late James Gardner, of Banbury, improved by Alexander Samuelson, of Banbury, and manufactured by the exhibiter (this implement obtained the prize medal at the Great Exhibition of 1851; the £5 prize at the Royal Agricultural Society's Show at Lewes, 1852; and the £5 prize at the Society's meetings at Norwich, 1849, and at Exeter, 1850); (new implement) two specimens of Samuelson's patent digging or forking machine, invented and manufactured by the exhibiter; a rising-mouth chaff cutter, for hand power, manufactured by the exhibiter; a universal crushing or bruising mill, invented by the late Mr. Stratton, of Bristol, improved and manufactured by the exhibiter; a bean splitting mill, invented, improved, and manufactured by the exhibiter; two sizes of an oil-cake breaker, manufactured by the exhibiter; a M'Cormick's patent American reaper, invented by Cyrus Hale M'Cormick, of Chicago, and manufactured by the exhibiter (this reaper obtained the Council Medal at the Great Exhibition of 1851); a five-tine and three-tine horse hoe, invented by William Busby, of Bedale, and manufactured by the exhibiter; two sizes of Anthony's patent American churn, invented by Charles Anthony, of Pittsburg, United States, and manufactured by the exhibiter (it took a silver medal at the Society's meeting at Exeter, and a prize medal at the Great Exhibition); two sizes of a registered atmospheric churn, invented and manufactured by the exhibiter; three sizes of Kase's patent force and suction (double action), invented by Kase, of the United States, improved and manufactured by the exhibiter; a semicircular-bottomed pig trough, manufactured by the exhibiter; three sizes of Budding's lawn-mowing machine or grass cutter, with Samuelson's registered improvements, invented by E. Budding, of Dursley, improved and manufactured by the exhibiter; two garden rollers, manufactured by the exhibiter; and a bundle of Chandler's patent hoes, invented by Thomas Chandler, of Aldbourne, near Hungerford, and manufactured by the exhibiter.

Barrett, Exall, and Andrewes, of Katesgrove Works, near Reading, Berkshire.

A four-horse power, a six-horse power, and an eight-horse power improved patent portable steam engine; a five-horse power and an eight-horse power fixed cylindrical steam engine; (new implement) a six-horse power fixed thrashing machine, combining straw shaker, screen, and blower; and (new implement) a six-horse power portable combined thrashing machine; invented, improved, and manufactured by the exhibiters; a four-horse power bolting thrashing machine; a three-horse power patent thrashing machine; a two-horse portable thrashing machine with two-horse patent safety gear (this machine had awarded to it the medal of the Great Exhibition, the commendation of the Royal Agricultural Society at Exeter; prize and medal of the Great Yorkshire Society at Leeds; prize of the same Society at Thirsk; the medal of the Royal Improvement Society of Ireland, at their several meetings, held at Cork, Dublin, and Galway; and the prize of the West of England Society, at Taunton); two sizes of a hand-power patent thrashing machine; a hand-power paragon or universal crushing mill; a one-horse power ditto; a steam power ditto; a crushing mill for malt, oats, linseed, &c., a pair of 24-inch peak stones for grinding corn; two sizes of an oil-cake crusher, and a double action crusher for rape and other cake, invented and manufactured by the exhibiters; a registered cam chaff cutter; and two sizes of a patent chain feed chaff cutter, invented, improved, and manufactured by the exhibiters; three sizes of a chaff cutting machine, invented by Mr. John Cornes, of Barbridge, improved and manufactured by the exhibiters (this machine has gained several prizes from the Royal Agricultural Society); a gorse crusher or bruiser (this machine obtained the Society's prize at York, also at the Society's meeting at Norwich, of £5 each time, and was commended by the judges at the Great Exhibition; also obtained £5 prize at Lewes); a patent one-horse safety gear (besides the commendation of the Royal Agricultural Society at Exeter, and prize medal of the Great Exhibition, has obtained the prize and medal twice from the Royal Society of Ireland, the prize and silver medal from the Great Yorkshire Society at Leeds in 1849, and a prize of £5 from the same Society at Thirsk in 1850); a portable circular saw bench; a grass and seed broadcast sowing machine, and a registered hay-making machine, invented, improved, and manufactured by the exhibiters (this latter machine obtained the prize of the Royal Improvement Society of Ireland at the Dublin meeting in 1851); a patent horse rake for hay, &c., invented and manufactured by the exhibiters (it had awarded last season the prize of the Great Yorkshire Society at Sheffield in competition with a great number; also first-class medal of the Royal Improvement Society of Ireland at Galway); a Read's patent subsoil plough (this plough obtained the following prizes awarded by the Royal Agricultural Society: £10 at Southampton, Shrewsbury, Newcastle, Northampton, and

York), a light iron two wheel and swing plough, and a one wheel plough, invented, improved, and manufactured by the exhibiters (this latter plough obtained the prize of £5 at the Royal Agricultural Society at Liverpool;) two sets of patent iron harrows, invented and improved by W. Armstrong, of Bedford, manufactured by the exhibiters; a set of patent iron drags, invented and improved by W. Armstrong, of Reading, manufactured by the exhibiters; a Norwegian harrow, invented by J. Stratton, of Bristol, improved and manufactured by the exhibiters; a horse hoe for turnips, mangel, &c., and a double beam horse hoe for corn and roots, invented, improved, and manufactured by the exhibiters; and a patent clod crusher, invented and improved by W. Cambridge, of Bristol, manufactured by the exhibiters.

Edward Hammond Bentall, of Heybridge, near Maldon, Essex.

Several specimens of Bentall's patent iron-beamed broadshare and subsoil plough, together with specimens of the same with cultivator or scarifier (combined in one implement), invented and manufactured by the exhibiter (the prize of £5 was awarded to this implement at the Meeting of the Royal Agricultural Society at Exeter, in 1850, as the best pair-horse scarifier; a prize medal was awarded to it, also, at the Great Exhibition, as a cultivator; and at the same time a prize medal was awarded to the same implement, as a subsoil plough: at the Lewes Meeting of the Royal Agricultural Society, 1852, it was highly commended); a Bentall's patent light broadshare plough; a Bentall's patent mangel or ridge hoe; a Bentall's patent mangel or ridge hoe and potato plough; a Bentall's patent mangel or ridge plough; a Bentall's patent double tom plough; four sizes of Bentall's patent parallel double angle iron-beamed plough, and a Bentall's patent self-registering dynamometer, all invented and manufactured by the exhibiter; a hand turnip cutter, improved and manufactured by the exhibiter; a Bentall's oilcake mill, invented and manufactured by the exhibiter; several sizes and shapes of cattle-water or feeding troughs, hog troughs, &c., &c., and a stack pillar and cap, all manufactured by the exhibiter.

William Busby, Newton-le-Willows, near Bedale, Yorkshire.

A light two horse waggon; a one horse cart (the prize of 10*l.* was awarded for this cart at the Exeter Meeting in 1850; it was also included in the awards of the Council Medals of the Great Exhibition, 1851; and received a 10*l.* prize at Lewes, 1852), a one or two horse cart; a one horse cart, and a cart for one or two horses, all invented and improved by Wm. Lister, Esq., of Dunse Bank, and manufactured by the exhibiter; a two wheeled deep plough (this plough received the prize at the Society's Meeting at Northampton, in 1847; at York, 1848, 10*l.*; at Lewes, 1852, 7*l.*; and included in the Council Medals of the Great Exhibition, 1851); a two wheeled plough for general purposes (this plough received the award of the Council Medal at the Great Exhibition, 1851), and a two wheeled two horse plough, all invented, improved, and manufactured by the exhibiter; a light two horse plough with two wheels, invented by the exhibiter; a one wheeled plough, invented, improved, and manufactured by the exhibiter; a clod crusher and Norwegian harrow combined, and a small hand hoe for two rows of corn, invented and improved by the Rev. W. F. Wharton, of Barniogham, and manufactured by the exhibiter; a horse hoe; a horse hoe without harrow; a horse hoe with five tines, and a two horse cultivator, all invented, improved, and manufactured by the exhibiter; and a small cart with two-and-a-half inch wheels, invented and improved by Wm. Lister, Esq., of Dunse Bank, and manufactured by the exhibiter.

Clayton, Shuttleworth, and Co., Lincoln.

A six horse power patent portable steam engine (this engine received a prize of 25*l.* at the Royal Agricultural Society's Meeting held at Norwich, 1849; at Exeter, 1850, 25*l.*; and a prize medal at the Great Exhibition of All Nations, 1851); a four horse power and a six horse power patent portable steam engine; a registered combined portable thrashing, straw shaking, riddling, and winnowing machine (this machine was exhibited at the Royal Agricultural Society's Meeting held at Lewes, 1852, and had awarded to it the prize of 20*l.*); (new implement) a patent combined portable thrashing, straw shaking, riddling, winnowing, or chaff separating machine—a portable thrashing and straw shaking machine—a portable thrashing, straw shaking, and riddling machine—a combined fixed thrashing, straw shaking, riddling, and winnowing machine—a set of fixed barn works (a silver medal and 10*l.* were awarded to this piece of machinery when exhibited at the Society's Meeting held at Lewes, 1852), a pair of registered portable Derbyshire millstones (received the prize of 10*l.* at the Royal Agricultural Society's Meeting held at Norwich in 1849; also at Exeter, 1850), a pair of portable millstones; a portable circular saw and bench; a seven horse power portable steam engine, and a corn dressing machine, all invented, improved, and manufactured by the exhibiters.

Richard Coleman, of Chelmsford, Essex.

Six specimens of a patent drag harrow, cultivator, or scarifier (the prize medal was awarded to this implement at the Great Exhibition of 1851); three specimens of a patent expanding harrow (the prize medal was awarded to this harrow at the Great Exhibition of 1851); a patent subsoil harrow or pulverizer, and a newly-invented horse hoe, all invented and manufactured by the exhibiter; and a newly-invented patent economic oven, invented by Michael Fitch, of Chelmsford, and manufactured by the Chelmsford Oven Company.

William Vanse Feast, of 14, Islington-square, Salford, Manchester, Lancashire.

(New implement) a mowing machine for cutting grass, &c., thirty inches in breadth, invented by Alexander Shanks, jun., of Arbroath, Scotland, and manufactured by Alexander Shanks and Son, of Arbroath, Scotland (awarded a silver medal at the last meeting of the Highland Agricultural Society at Perth last year); three different sizes of a patent press-wheel roller and clod-crusher, invented and improved by Wm. Cambridge, of Bristol, and manufactured by John Cartwright, of Shrewsbury, sole licensed agent for Salop and North Wales (awarded a prize of £5 at the Royal North Lancashire meeting at Preston; also prizes at Exminster, Edinburgh, North Lincolnshire meeting, &c., &c.), a specimen of bright varnish; a specimen of black japan varnish; a specimen of anti-friction grease; a specimen of engine oil, and a black japan varnish, invented and manufactured by Messrs. Denton and Jutsum, of Bow-common London.

Charles Fletcher, Gloucester Railway Iron Works, near Gloucester.

A chaff engine, invented and manufactured by the exhibiter; a chaff engine, invented, improved, and manufactured by the exhibiter; and (new implement) a turnip machine, invented and manufactured by the exhibiter.

Fowler and Fry, Bristol.

(New implement) a manure distributor (patent), invented, improved, and manufactured by the exhibiters; a Northumberland turnip drill, and a broadcast drill for grass-seeds, clover, &c., improved and manufactured by the exhibiters; a registered farm cart, invented, improved, and manufactured by the exhibiters; an improved farm cart, invented by Mr. Stratton, of Bristol, improved and manufactured by the exhibiters; (new implement) a brick and pipe-making machine, invented by Randell and Saunders, of Corsham, Wilts, improved and manufactured by the exhibiters; two sizes of a Gloucestershire cultivator and scarifier; a patent universal lever drill, and a one-row seed and manure drill for the ridge or flat, invented, improved, and manufactured by the exhibiters; an Evesham three-row corn and seed drill, manufactured by the exhibiters; a harvest cart, invented by J. Hannand, Esq., of Burcot Park, Oxon, improved and manufactured by the exhibiters; (new implement) a planksided farm cart for general purposes, invented and manufactured by the exhibiters; a light agricultural cart, invented by the late Mr. Stratton, of Bristol, improved and manufactured by the exhibiters; a one horse cart for the conveyance of stone and other heavy substances, improved and manufactured by the exhibiters; a crank axle spring cart; a large tumbler cart; a small-sized tumbler cart, and a cylinder liquid manure cart to hold 100 gallons, invented by the late Mr. Stratton, of Bristol, improved and manufactured by the exhibiters; a liquid manure tank, and a spring crank axle cart for conveyance of fat stock, improved and manufactured by the exhibiters; (new implement) a light waggon suited for general farm purposes, invented, improved, and manufactured by the exhibiters; a Gloucestershire waggon; a spring sack waggon; several pairs of wheels, and a winnowing machine, improved and manufactured

by the exhibiters; a corn and pulse bruiser; a bean mill; a malt mill, and a linseed mill, invented by the late Mr. Stratton, of Bristol, improved and manufactured by the exhibiters; two specimens of a two-knife chaff-cutter, and two specimens of a three-knife chaff-cutting machine, invented by Cornes, of Barbridge, and manufactured by the exhibiters; a turnip cutter (patent), invented and manufactured by Bushe, of Glencairn, Lismore; an oilcake crusher for light cakes, invented, improved, and manufactured by the exhibiters; (new implement) a Somersetshire hay rake or collector, improved and manufactured by the exhibiters; a one-horse hoe for root crops, manufactured by the exhibiters; two specimens of an iron wheelbarrow, and two hand rakes improved and manufactured by the exhibiters; a Norwegian harrow, invented by the late Mr. Stratton, of Bristol, and manufactured by the exhibiters; a spring dray with cast-iron wheels for the conveyance of hogsheads and heavy goods; a patent draining plough (this machine received the society's silver medal at the Exeter meeting in 1850, and honourable mention at the Great Exhibition of 1851), and (new implement) a steam draining plough, invented by John Fowler, jun., of Bristol, and manufactured by the exhibiters; a patent Northumberland clod-crusher, invented by Gibson, improved and manufactured by J. Richardson and Son, of Newcastle-on-Tyne (it was tried at Pusey, in Berkshire, at the trial of the Exhibition implements in 1851, and the judges awarded it the prize medal; and it also gained in the following year the prizes at the Royal Society's shows at Galway and at Perth, besides those of many of the provincial shows, viz., at Norwich, Horncastle, Preston, Cleveland, Wigton, Sunderland, and Aberdeen); two sizes of a field roller, and a cobourg, improved and manufactured by the exhibiters; a lawn mowing machine, invented by Mr. Budding and manufactured by Ferrabee and Sons, Stroud; several cast-iron pig-troughs, manufactured by the exhibiters; a garden engine for watering gardens and flower beds, invented and manufactured by Mr. Reed, of London; a Bentall's broadshare plough, invented and manufactured by E. W. Bentall, of Heybridge, Essex (it obtained a prize of £2 at the Exeter meeting, and a prize medal at the Great Exhibition, and at the same time a prize medal as a subsoil plough); a liquid manure pump, invented by Warner and Sons, of London, and manufactured by the exhibiters; a weighing machine, invented by Avery, of Birmingham, and manufactured by the exhibiters; two sizes of a Sussex metallic churn, invented, improved, and manufactured by Mr. Attwood, of Lewes; a cheese tub; a butter trundle; a pair of butter beaters; a butter cup; three butter prints; three cheese vats; two bushel measures; a half-bushel measure, and a seedlip, all manufactured by the exhibiters; a coil of one-inch gutta-percha tubing, invented and manufactured by the Gutta Percha Company; a curd mill, manufactured by the exhibiters; a double-action compound lever cheese press, and a single-action ditto, invented, improved, and manufactured by the exhibiters; a pair of spring hand trucks, and a sheep trough, improved and manufactured by the exhibiters; and three sizes of a cast-iron drain mouth, invented and manufactured by the exhibiters.

JAMES CORNES, Barbridge, near Nantwich, Cheshire.

Two sizes of a registered chaff cutting machine (No. 5) with three knives (this machine gained a prize of £10 at the Royal Agricultural Society's meeting at Shrewsbury, in 1845; at Newcastle-upon-Tyne, 1846; at Northampton, 1847; the Society's silver medal at York, 1848, a prize of £10 at Norwich, 1849; £10 at Exeter, 1850; and the prize medal of the Great Exhibition, 1851); and several sizes of a chaff cutting machine with two and three knives, all invented, by J. Cornes, senior, of Barbridge, improved and manufactured by the exhibiter; a curd mill, invented and manufactured by the exhibiter; and (new implement) a bone mill for hand power, invented by John Cornes, senior, of Barbridge, and manufactured by the exhibiter.

JAMES and HENRY FERRABEE, Phœnix Iron Works, near Stroud, Gloucestershire.

A six horse power portable steam engine, and an eight horse power stationary steam engine, improved and manufactured by the exhibiters; a sheaf elevator; a thrashing machine, and a straw shaker, invented, improved, and manufactured by the exhibiters; a winnower; a refuse elevator, and a corn elevator, improved and manufactured by the exhibiters; a hummeller, invented, improved and manufactured by the exhibiters; a corn dressing machine; a corn screen, and a straw band, improved and manufactured by the exhibiters; a 12-inch registered chaff and litter cutter, invented, improved, and manufactured by the exhibiters; a grinding mill, and a corn and linseed crusher, improved and manufactured by the exhibiters; three sizes of a portable thrashing machine; a 12-inch and a 9-inch registered chaff and litter cutter, invented, improved, and manufactured by the exhibiters; a 12 inch patent spiral chaff and litter cutter, invented by the late Earl Ducie, R. Clyburn, and E. Budding, of the Uley Iron works, improved and manufactured by the exhibiters; a set of pulleys in a frame for driving the spiral chaff cutter, manufactured by the exhibiters; an iron stationary horse power for one or two horses; a 16 inch, a 19-inch, a 22-inch hand, and a 36-inch horse lawn mowing machine with registered improvements, and a set of screw wrenches, invented by E. Budding, of Dursley, improved and manufactured by the exhibiters.

THOMAS GLOVER, Thrussington, near Loughborough, Leicester.

A turf and stubble paring plough, invented, improved, and manufactured by the exhibiter (this implement gained a prize of £4 at the Royal Agricultural Society's Show at Liverpool, 1843; a prize of £5 at the Derbyshire Agricultural Society's Show at Chatsworth, 1843; a prize of £5 at the Royal Agricultural Society's Show at Northampton, 1847; a prize of £2 and a silver medal at the Yorkshire Agricultural Society's Show at Scarborough, 1847; a prize of £5 at the Royal Agricultural Society's Show at York, 1848; a prize of £5 at the Royal Agricultural Society's Show at Norwich, 1849; a prize of £5 at the Royal Agricultural Society's Show at Exeter, 1850; and a prize of £5 at the Royal Agricultural Society's Show at Lewes, 1852.

RICHARD GEORGE GOATMAN, Berrow, Worcestershire, near Ledbury, Herefordshire.

(New implement) a corn dressing machine, invented and manufactured by the exhibiter; a corn dressing machine, invented by John Goatman, of Berrow, improved and manufactured by the exhibiter; and (new implement) a corn drill, invented and manufactured by the exhibiter.

JOHN GOUCHER, Worksop, Nottinghamshire.

A four horse portable patent bolting thrashing machine, adapted to steam or horse power; a two horse portable patent thrashing machine, adapted to steam or horse power; a six horse patent portable bolting thrashing machine, adapted to steam power, and a six horse stationary patent bolting thrashing machine, all invented, improved, and manufactured by the exhibiter.

J. GRAY and Co., Uddington, Glasgow, Lanarkshire.

An improved one horse Scotch farm cart, improved and manufactured by the exhibiters (awarded the prize medal at the Great Exhibition of 1851); a parallel lever subsoil pulverizer, invented, improved, and manufactured by the exhibiters (awarded the first prize at Lewes meeting, 1852; the Highland and Agricultural Society of Scotland's first prizes; Royal Agricultural Improvement Society of Ireland's first prizes; the Bath and West of England's at Taunton; the Yorkshire, the Lincolnshire, and Lancashire Agricultural Societies' first prizes, &c.); an improved subsoil pulverizer; an improved two horse Scotch swing plough (awarded the prizes of the Royal Highland Society, and Royal Agricultural Society of Ireland, &c.); a parallel five tined drill grubber or pulverizer, (received the prize at the meetings of the Royal Agricultural Society of Ireland, Highland Society, &c.); and a parallel expansion horse hoe for drill crops, invented and manufactured by the exhibiters; a light drill scuffler or hoe; a strong drill scuffler, and an equalizing three horse yoke, improved and manufactured by the exhibiters; and two specimens of a two horse yoke, manufactured by the exhibiters.

WILLIAM HARKES, Lostock Graham, near Knutsford, Cheshire.

A registered reaping machine, with self-acting forks (it was awarded the silver medal of the Manchester and Liverpool Society, September 23rd, 1852; and £5 from the Flint and Denbighshire Agricultural Society, September 26, 1852; (new implement) a plough for getting potatoes up or skimming stubbles, invented and manufactured by the exhibiter; a swing or wheel plough adapted for general purposes, improved and

manufactured by the exhibiter; a light one horse hoe, invented by David Harkes, of Mere, improved and manufactured by the exhibiter; and a scarifier with harrow attached, invented and manufactured by the exhibiter.

W. G. HARMAN, of Gloucester.

Two specimens of (new implement) a small chaff cutter to be worked by hand power, improved and manufactured by the exhibiter.

ISAAC JAMES, of Cheltenham, Gloucestershire.

(New implement) a hand manure distributor, invented and manufactured by the exhibiter.

JOHN JAMES and Co., of 24, Leadenhall-street, and 244, Whitechapel-road, London.

(New implement) a ten ton weighbridge for weighing waggons, &c., a three ton weighing machine (£10 prize Derby, 1843; Shrewsbury, 1845; Newcastle, 1846; and Northampton, 1847); a twenty-one cwt.; a ten cwt.; a six cwt. weighing machine (awarded £5 at Southampton meeting, 1844), a three cwt., and (new implement) a one cwt. weighing machine, invented and manufactured by the exhibiters; a pair of three inch; four inch; five inch, and six inch iron sheave blocks; a pair of three inch; four inch, and five inch brass sheave blocks; (new implement) a portable iron house for shepherds and outdoor operations generally, and a model of a farm labourer's house, manufactured by the exhibiters.

THOMAS MILFORD, Thorverton, near Cullompton, Devon.

(New implement) a stout one horse cart for general farm and road purposes; (new implement) a one horse cart for general farm and harvest work, and (new implement) a two horse improved (Taunton prize) tipping waggon with corn lades, all invented, improved, and manufactured by the exhibiter (the waggon was awarded the prize at the Taunton meeting of the Bath and West of England Agricultural Society, 1852, as the best two horse waggon for general purposes).

THOMAS ROGERS, Middlehill, in the parish of Angle, near Pembroke.

A swing plough, invented by the exhibiter, improved by Thomas Lewis, of Pembrokeshire, and manufactured by William Powell, Menkton, Pembrokeshire.

ALEXANDER KENNEDY SMITH, Commercial-road, Exeter, Devon.

Three different specimens of (new implement) a registered rotary screening machine, for screening ashes and other manures for drilling with turnips, wheat, &c., invented, improved, and manufactured by the exhibiter.

EDWARD HILL and Company, of Brierley Hill Iron Works, near Dudley, and 53, Watling-street, City, London.

A set of improved cast iron stable furniture; a set of samples of cast iron rain water pipes for farm and other buildings; a wrought iron barrow with apparatus for heating gas tar, &c., and a wrought iron garden barrow for general purposes, all invented and manufactured by the exhibiters; a specimen of patent black varnish; a specimen of game proof wire netting, consisting of six rolls, galvanized and ungalvanized; several specimens of a game proof garden hurdle of wrought iron; a wrought iron sheep hurdle; ox hurdle; cattle hurdle; a wrought iron flower stand, circular, with revolving stages; a cast iron table flower stand; an ornamental cast iron flower stand; an ornamental cast iron garden seat; several lengths of premium continuous sheep and other fence, with game proof netting attached, 2½ft. high (this obtained the silver medal of the Royal Agricultural Society at the Southampton meeting, and also at the Shrewsbury meeting); a circular flower stand with ornamental wire work; an ornamental cast iron table; an ornamental wrought iron garden seat with foot-stage; two specimens of cast iron hall chairs; a length of invisible strained wire ox fence; an improved wrought iron sheep feeding hurdle (this hurdle has obtained the prize of the Royal Agricultural Improvement Society of Ireland for the best moveable hurdle for feeding sheep, besides prizes from the Yorkshire and other societies); several improved wrought iron sheep, cattle, and other hurdles, and a wrought iron ornamental hand gate, and posts of cast iron, all invented and manufactured by the exhibiters; a patent mowing or cutting machine, for lawns, pleasure grounds, bowling greens, &c., invented by Mr. Budding, manufactured by Messrs. Ferrabee, of Stroud; several wrought iron gates, some hung to wooden posts, some to iron posts; and a premium wrought iron field gate and wrought iron posts, invented and manufactured by the exhibiters (the silver medal of the Royal Agricultural Society was awarded to this gate and posts at the Derby meeting, and the Royal Agricultural Improvement Society of Ireland awarded it the prize they offered for "the best and most economical field gate of any material"); a pair of wrought iron entrance gates; a wrought iron sheep trough on wheels; a wrought iron garden seat, and a registered wrought iron expanding horse hoe, invented and manufactured by the exhibiters (the silver medal of the Royal Agricultural Society was awarded to this implement at the Exeter meeting, and it also obtained a silver medal from the Yorkshire Agricultural Society at their meeting at Thirsk); two wrought iron skim or pair horse scarifiers (this implement obtained the first prize of its class at the Derby meeting); a registered wrought iron expanding horse hoe, invented, improved, and manufactured by the exhibiters; two wrought iron horse hoes; (new implement) a wrought iron pair horse scarifier or skim, and two wrought iron sheep racks on four wheels with roof, invented and manufactured by the exhibiters (at the Derby meeting of the Royal Agricultural Society a silver medal was obtained by this implement); an improved patent horse rake for hay, corn, stubble, scutch, &c., invented and manufactured by Smith, of Stamford (it was highly commended by the judges of the Royal Agricultural Society at Norwich, 1849; obtained the prize of the North Lincolnshire Society, 1850; the first prize of the Royal North Lancashire Society, 1850; again the first prize of the Royal Irish Agricultural Society, 1850; the first prize of the Royal Highland Society of Scotland, 1850; and the prize medal of the Great Exhibition of 1851); a patent Northumberland clod crusher, invented by Gibson, of Newcastle-on-Tyne, and manufactured by John Richardson, of Newcastle-on-Tyne (this implement was first introduced to the public at the Great Exhibition in 1851, and was tried at Pusey, at the trial of the exhibition implements, where the judges awarded it the prize medal; and it has since obtained many other premiums from provincial agricultural societies); a wrought iron rick stand, on cast iron pillars, 16 feet diameter and 11 pillars, improved and manufactured by the exhibiters; an improved chaff cutting machine and a corn crusher (No. 2), invented and manufactured by Richmond and Chandler, of Manchester; a set of patent four beam diagonal wrought iron harrows, with trussed whippletree, invented by Samuel Taylor, of Cotton End, and manufactured by the exhibiters (these harrows obtained a prize at the meeting of the Royal Agricultural Society at Derby, 1843; at Southampton, 1844; at Shrewsbury, 1845; at Northampton, 1847; at Norwich, 1849; at Exeter, 1850; the prize medal was also awarded for these harrows at the Great Exhibition of 1851); a patent three cwt. and a five cwt. weighing machine, with frame for sheep, invented and manufactured by Day and Co., of Birmingham; a portable forge or smith's hearth; a wrought iron cow crib with roof of iron, and an oblong rick stand on cast iron pillars with wood top, invented and manufactured by the exhibiters.

WILLIAM NEWZAM NICHOLSON, of Newark-upon-Trent, Nottinghamshire.

Three specimens of machines for breaking oilcakes for beasts and sheep (this implement had a prize of £5 awarded to it at the Norwich show); and two machines for breaking oilcake for beasts and sheep, and rape cake for tillage (one of which received the prize of £5 at the Exeter show, and the prize medal at the Great Exhibition, London), invented, improved, and manufactured by the exhibiter; a very strong machine for breaking foreign oilcake for beasts, &c., invented and manufactured by the exhibiter; a machine for grinding beans, oats, malt, barley, &c.; a very complete corn dressing or winnowing machine, combining in one implement a complete roughing, dressing, and blowing machine; a corn roughing or winnowing machine, and a winnowing or corn dressing machine, which may also be used as a blower, all invented, improved, and manufactured by the exhibiter; a barley awning or hummelling machine; a chaff engine, and a one row ridge turnip drill, for seed and manure, improved and manufactured by the exhibiter; Sussex metallic churns and pans, improved

and manufactured by Thomas Attwood, of Lewes; two cottage cooking ranges, with patent improvements (one of which had a prize of £5 awarded to it at the Yorkshire, and a further prize of £5 at the Exeter show); a cooking range, adapted for a small farm; a cooking range for farm kitchens; a superior range for farm kitchens, and two cottage cooking grates, invented, improved, and manufactured by the exhibiter; an improved kitchen cooking apparatus, improved and manufactured by the exhibiter; two Anglo-German cooking stoves for cottages (received a silver medal at the Society's Exeter show); a cottage grate for bedrooms; a cosmopolitan cooking stove; a smaller cosmopolitan cooking stove; cottage pumps, sinks, and troughs, and a combined portable thrashing, straw-shaking, and roughing machine, all invented, improved and manufactured by the exhibiter.

GEORGE PARSONS, West Sambrook, near Ilminster, Somersetshire.

(New implement) a fixed eight horse power high pressure steam engine, improved and manufactured by the exhibiter; (new implement) a machine, with patented improvements, for thrashing, shaking, dressing, and separating corn, invented, improved, and manufactured by the exhibiter; two sizes of a corn, linseed, rape, and malt-bruising or crushing machine, invented by the exhibiter and Richard Clyburn, of West Sambrook and London, and manufactured by the exhibiter; a patent chaff cutter, invented by late Earl Ducie, R. Clyburn, and Edwin Budding, and manufactured by the exhibiter (prizes were awarded to this implement at Liverpool, 1841—£10; at Derby, 1843—£10; at Southampton, 1844—£10, and silver medal); (new implement) a flax scutching machine, invented by the late Richard Clyburn, of London, improved and manufactured by the exhibiter; the Uley cultivator, invented by Mr. J. Morton, of Whitfield Farm, improved and manufactured by the exhibiter (the following prizes were awarded to late Earl Ducie for this machine: at Liverpool, £15; at Southampton, 1844, £10 and a silver medal; at Shrewsbury, 1845, £10; and to Mr. Wm. Crosskill, at Newcastle-upon-Tyne, 1846, £10); a set of registered screw spanners, invented by the late Richard Clyburn, of London, and manufactured by the exhibiter (a silver medal was awarded for this invention, at Southampton, 1844).

E. R. TURNER and Co., St. Peter's Foundry, Ipswich, Suffolk.

A six horse power horizontal fixture steam engine, improved and manufactured by the exhibiters; two sizes of Turner's registered roller mill, invented, improved, and manufactured by the exhibiters; two sizes of a roller mill, for crushing linseed, oats, lentils, malt, &c., invented by Bond, Turner, and Hurwood, of Ipswich, improved and manufactured by the exhibiters; a small hand crushing mill, for oats, linseed, and beans, and (new implement) a newly invented registered grinding mill, invented and manufactured by the exhibiters; a horse power for two horses; an intermediate motion; and a portable circular saw bench, improved and manufactured by the exhibiters.

TUXFORD and SONS, Boston and Skirbeck Iron Works, Boston, Lincolnshire.

Two sizes of patent portable housed steam engines; an improved fixed steam engine; a patent combined thrashing, shaking, and winnowing machine, and a patent perforated table straw shaker, invented, improved, and manufactured by the exhibiters; an improved saw table, invented and manufactured by the exhibiters; and a kibbling and crushing mill, invented, improved, and manufactured by the exhibiters.

HENRY ATWOOD THOMPSON, Lewes, Sussex.

A two-horse-power portable thrashing machine, manufactured by the exhibiter; a two-horse-power; a three-horse-power, and a six-horse-power patent portable thrashing machine, with patent gear, manufactured by Barrett and Co., of Reading (the six-horse-power engine obtained the commendation of the Royal Agricultural Society at Exeter, and the prize medal at the Great Exhibition in 1851, the prize of £20 at the Royal Agricultural Society's meeting at Lewes, and the gold council medal of the Royal Agricultural Improvement Society of Ireland); an improved winnowing machine, manufactured by the exhibiter; (new implement) a much-improved corn blower or cleaner, improved and manufactured by the exhibiter; a barley aveller or hummeller, manufactured by the exhibiter; (new implement) a chaff-engine, with two knives, improved and manufactured by the exhibiter; two chaff engines with two knives, and two with one knife, manufactured by the exhibiter; a registered chaff engine, with three knives, invented by James Cornes, of Barbridge, Cheshire, and manufactured by Barrett and Co., of Reading (this machine gained a prize of £10 at Shrewsbury, at Newcastle, at Northampton, and at Norwich, the Society's silver medal at York, and a prize of £5 at Lewes); a Gardner's turnip cutter, invented by James Gardner, of Banbury, and manufactured by the exhibiter; a patent double-action Gardener's turnip cutter, invented by James Gardner, of Banbury, and manufactured by B. Samuelson, of Banbury (a prize of £5 was awarded to this machine at Norwich and at Exeter, and £5 to a larger machine on the same principle at Lewes); Phillips's patent turnip cutter, manufactured by Phillips, of Bristol; two oilcake breakers, and a double roller oilcake breaker, manufactured by the exhibiter; a hand-power bean mill, invented by Mr. Seamens, and manufactured by the exhibiter; a linseed or oat-crushing mill, manufactured by the exhibiter; a paragon universal grain mill, manufactured by Barrett and Co., of Reading; a patent double crushing mill, manufactured by Ransome and Sims, of Ipswich; an imperial universal crushing mill, manufactured by James Woods, of Stowmarket; three patent trussed beam iron ploughs, manufactured by Ransome and Sims, of Ipswich (one of these, marked Y.L., with two wheels, was awarded the prize of £10 and silver medal as the best heavy land plough, and a prize of £10 and silver medal as the best light land plough, at the Royal Agricultural Society's meeting at Southampton; also a prize of £10 at Northampton, the council medal at the Great Exhibition for the plough as made by Busby, and a modification of this plough also obtained the prize at the Lewes meeting); a patent iron plough, with two wheels, manufactured by J. and F. Howard, of Bedford; a set of one-horse and a set of two-horse patent diagonal iron harrows, invented by Samuel Taylor, of Cotton End, and manufactured by W. Williams, of Bedford (these harrows obtained a prize at the meeting of the Royal Agricultural Society at Derby, Southampton, Shrewsbury, Northampton, Norwich, Exeter, the prize medal at the Great Exhibition of 1851, and a prize as heavy harrows at Lewes in 1852), also a set of three-horse ditto, manufactured by W. Williams, of Bedford; a set of patent trussed iron whippletrees, manufactured by Ransome and Sims of Ipswich; a set of wrought steel waggon hames, and a double cylinder land roller, 16 in. diameter, with pair of oak rods, improved and manufactured by the exhibiter; an extra strong double cylinder land roller, 18 in. diameter; another 26 in. diameter, with double rods for horses or oxen, invented, improved, and manufactured by the exhibiter; a two-wheel seam presser, and a five-wheel seam presser, or drill roller, improved and manufactured by the exhibiter; an improved broadshare and cultivator, called the "Gloucestershire Broadshare," manufactured by James Wood, of Stowmarket; (new implement) a Johnson's patent akim or broadshare cultivator, invented by the Rev. E. H. Johnson, of Gravelye Lindfield, Sussex, and improved and manufactured by the exhibiter; a patent broadshare and subsoil plough, manufactured by E. H. Bentall, of Maldon, Essex (a prize of £5 was awarded to this implement at Exeter, and a medal at the Great Exhibition); (new implement) a wrought-iron subsoil pulverizing plough, two wrought-iron horse hoes or grubbers, improved and manufactured by the exhibiter; a wrought-iron expanding horse hoe, with Norwegian harrow, and a wrought-iron horse hoe, or scarifier, manufactured by the exhibiter; a swing steerage horse hoe, improved and manufactured by the exhibiter; (new implement) a patent one-sow turnip and mangel wurzel seed and manure drill, manufactured by Smyth and Sons, of Suffolk; a barrow broadcast drill, manufactured by the exhibiter; a double-action haymaking machine, improved and manufactured by the exhibiter; a lever horse rake, manufactured by Williams, of Bedford (this was awarded a prize of £5 at Southampton and Norwich, and at the Dublin show of the Royal Agricultural Improvement Society of Ireland in 1851); a sample of four steel tooth drag rakes; an improved weighing machine for sacks, &c., and an improved granary weighing machine, manufactured by the exhibiter; a platform weighing machine, invented by Fairbank, and manufactured by Forshaw, of Liverpool; (new implement) an improved portable copper, to hold 8 gallons,

invented, improved and manufactured by the exhibiter; a patent iron pump, manufactured by Warner, of London; an improved cast-iron pump, with 3½-inch working barrel, and another with 4-inch working barrel, manufactured by the exhibiter; a portable liquid manure pump, with 5-inch working barrel, invented and manufactured by the exhibiter; (new implement) a portable iron pump, on tripod stand, with flexible hose, invented, improved, and manufactured by the exhibiter; a liquid manure irrigator and farmers' fire engine, invented and manufactured by the exhibiter; specimen pattern of artesian well boring tools, improved and manufactured by the exhibiter; a drainage level, called the A level, invented by Denton, of London, and manufactured by Messrs. Jones, of London; a Blundell's improved drainage level, invented by Blundell, and manufactured by Howe and Co., of London; (new implement) a telescope drainage level and staff, manufactured by Gardner of Glasgow; a Dentshire or breast plough and handle, and a steel brick mould and stock, manufactured by the exhibiter; an improved sheep feeding trough, on wheels, 10ft. long; (new implement) two sizes of an improved tin square box churn, invented and manufactured by the exhibiter; two sizes of an improved Sussex churn, and two sizes of an improved wood box churn, manufactured by the exhibiter; an improved American churn, invented and manufactured by Anthony, of Pittsburgh, America (this churn obtained the prize medal at the Royal Agricultural Society's meeting at Exeter, 1850; also a prize medal at the Great Exhibition, 1851; and was commended at the Lewes meeting, 1852); a sample of long-handle steel dung forks; a sample of eye-handle steel dung forks; and a sample of cast-steel digging forks, invented by Parkes, of Birmingham, and manufactured by Winton and Sons, of Birmingham (they were awarded a prize medal at the Lewes meeting, 1852); a sample of steel hay forks; a set of steel draining tools; two sets of steel draining tools; three bright solid cast-steel taper draining tools, and specimens of cast-steel London pattern spades, manufactured by Winton and Sons, of Birmingham; and three rolls of japanned and galvanized strong wire netting, manufactured by Bedford and Co., of London.

THOMAS WEBB, Gloucester.

Two sizes of a hand-power chaff machine; a double cheese-press, and a curd grinder and cowl, all improved and manufactured by the exhibiter.

WILLIAM WILLIAMS, Bedford.

Four different sets of patent four-beam diagonal iron harrows (these harrows obtained a prize at the meeting of the Royal Agricultural Society at Derby, 1843; at Southampton, 1844; at Shrewsbury, 1845; at Northampton, 1847; at Norwich, 1849; at Exeter, 1850; the prize medal was also awarded for these harrows at the Great Exhibition of 1851; also a prize at the Lewes meeting, 1852); a patent horse rake (a prize was awarded to this implement at the meeting of the Royal Agricultural Society at Southampton, 1844; also at Norwich, 1849; and at the Royal Agricultural Improvement Society of Ireland's meeting at Dublin, 1851), and a wrought-iron plough with patent coulter, invented and improved by Samuel Taylor, of Cotton End, and manufactured by the exhibiter; a machine for making draining pipes and tiles, invented by Saunders and Williams, of Bedford, improved and manufactured by the exhibiter (a prize of £25 was awarded to this machine at the meeting of the Royal Agricultural Society at Northampton, 1847, and at Dublin, 1851); a machine for making draining pipes and tiles, invented and manufactured by the exhibiter; a die for making hollow bricks, with cutting stage, invented by Mr. Beurt, of Godmanchester, manufactured by the exhibiter; a chaff engine; three chaff engines with two knives, and a chaff engine with three knives, invented, improved, and manufactured by the exhibiter; two wrought-iron horse hoes, and a wrought-iron scuffler or scarifier, invented and manufactured by the exhibiter; a set of whippletrees, invented, improved, and manufactured by the exhibiter; and a patent universal horse hoe, invented by Mr. Robert H. Nicholls, of Bedford, and manufactured by the exhibiter.

CHARLES WOOD, of Staplegrove, near Taunton, Somerset.

(New implement) a reaping machine; (new implement) a mowing machine, and (new implement) a drill for drilling manure, turnips, and mangel-wurzel on the flat, all invented and manufactured by the exhibiter.

JAMES WOODS, Stowmarket, Suffolk.

(New implement) a portable asphalte cauldron, invented and manufactured by the exhibiter; a specimen of asphalte flooring; two registered universal mills for crushing and grinding, invented, improved, and manufactured by the exhibiter; a crushing mill only, improved and manufactured by the exhibiter; an improved one-horse power, invented, improved, and manufactured by the exhibiter; a Gloucester broadshare cultivator; a Gloucester cultivator or scarifier; a two-horse Suffolk scarifier or skim, and a double tom moulding-up and ridge plough, improved and manufactured by the exhibiter; a set of scarifying harrows with whippletrees, and a one-horse cart with harvest frame, invented, improved, and manufactured by the exhibiter; (new implements) two specimens of Hall's patent mangle, invented by Charles Hall, of Finborough, and improved and manufactured solely by the exhibiter; a double roll for spring corn, &c., invented, improved, and manufactured by the exhibiter (the Royal English Agricultural Society awarded their prize of 10 guineas for this article at their Cambridge meeting).

JOHN CALE, of Gloucester.

A black enamelled slate chimney piece; a St. Ann'a enamelled slate chimney piece; a Lumychelle enamelled slate chimney piece; a plain slate kitchen chimney piece for farm houses, &c.; a slate cistern for farm house purposes, 300 gallons; others for 150 and 80 gallons; four slate milk coolers, with plugs, &c., complete; three whey coolers, with plugs, &c., complete; a slate cattle trough, with manger; two slate salting stones; two slate butter stones, and a slate slab for flooring of Davis's barn floors, &c., all manufactured by the exhibiter.

SAMUEL and CHARLES ADAMS, Oldbury, near Birmingham.

Two sizes of an Adams's steel patent flour mill and stand; an Adams's patent mill for kibbling barley, oats, malt, &c., and Adams's patent steel mill for malt, invented and manufactured by the exhibiters; and parts of Adams's steel mill, showing the peculiarity and superiority of construction and manufacture.

ROBERT COGAN, of 48, Leicester-square, London, Middlesex.

(New implement) a vitreous enamelled churn, of entirely new construction, invented, patented, and manufactured by the exhibiter; Cogan's patent glass churn; glass pails for dairy purposes, and glass butter slabs, invented, improved, and manufactured by the exhibiter; a variety of glass milk pans, and glass cream pots, various sizes, improved and manufactured by the exhibiter; Lord Camoya' syphons, invented by Lord Camoys, of Henley-on-Thames, manufactured by the exhibiter; lactometers for testing quality of milk, manufactured by the exhibiter; Cogan's milk tests, invented, improved, and manufactured by the exhibiter; a glass ventilator for dairies, stables, conservatories, &c., invented and manufactured by Mr. Moore, of Clerkenwell; a collection of small glass articles, and sundry farm paints and colours.

WILLIAM DODDS and Co., Leadenhall-street, London.

(New implements) three sizes of a patent eccentric churn, invented by Theophilus John Nash, of London, and manufactured by the exhibiters; and three sizes of a pat nt double acting lift and force pump, invented and manufactured by Robert Urwin, of London.

GIBSON and SON, St. Andrew's Works, Gallowgate, Newcastle-on-Tyne, Northumberland.

A clod crusher, called "the Northumberland clod crusher," invented by Matthew Gibson, of Newcastle-on-Tyne, and manufactured by the exhibiters (at the Great Exhibition of the Industry of All Nations, 1851, it gained the prize medal; it also obtained in 1852, the first prize at the shows of the Highland Society and the Royal Society of Ireland, and the principal shows in England and Scotland; and a turnip drill, called "the Northumberland cup turnip drill," invented by Andrew Common, of Bustin, Northumberland, and manufactured by the exhibiters.

HARE and Co., of 31, Essex-street, Strand, London.

A patent portable house or cottage for shepherds, farm labourers, or emigrants; a portable iron bedstead; a cottager's stove, invented and manufactured by George Bower, of St. Neot's; two sizes of a patent box churn, invented and improved by the late Thomas Wilkinson, of London, manufactured by Mrs. Wilkinson, of London (obtained a prize medal at the Great Exhibition of 1851); two sizes of (new implement) a patent rotary valveless pump, invented and manufactured by John Smith, of Uxbridge; a length of patent flexible tubing, invented, improved, and manufactured by Nickells and Co., of London; a Lillett's garden fork; digging fork; digging fork with long handle, and a Derbyshire hoe, invented by John Lillett, of Kelsale, manufactured by Ransome and Sims, of Ipswich; two sizes of a folding chair, invented and manufactured by Wm. Massingham, of Ipswich; and samples of Beadon's patent gutter tiles, invented and manufactured by Wm. Beadon, of Otterhead.

JAMES HART, of Atlas Iron Works, Borough-road, Southwark, Surrey.

(New Implement) a machine for the manufacture of bricks, invented, improved, and manufactured by the exhibiter; a flour mill, improved and manufactured by the exhibiter; (new implement) a machine for the manufacture of biscuits, invented, improved, and manufactured by the exhibiter; and a one horse power, for driving machinery, improved and manufactured by the exhibiter.

HOLMES and SONS, Norwich, Norfolk.

A six-horse power improved portable steam engine, and a four-horse power ditto, improved and manufactured by the exhibiters; a patent six-horse power portable steam thrashing machine, shaker, riddle, and winnower combined, invented, improved, and manufactured by the exhibiters (to this machine the first prize medal at the Great Exhibition was awarded); a patent portable four-horse power thrashing machine, with shaker and riddle, to be driven by steam, improved and manufactured by the exhibiters; a two-horse power portable thrashing machine, invented and manufactured by the exhibiters; (new implement) a portable steam power cloverseed drawer, or shelling machine, with dressing apparatus connected, invented, improved, and manufactured by the exhibiters; a small occupation eight-row lever corn drilling machine, improved and manufactured by the exhibiters; the Bath and West of England Society's prize manure, mangel-wurzel, and turnip drilling machine; the manure distributor, for sowing broadcast or in rows; a four-row lever mangel wurzel and turnip drilling machine; an improved steerage horse hoe; a corn-dressing or winnowing machine, and another for small occupations, invented, improved, and manufactured by the exhibiters; (new implement) a barley aveller or hummeller, with blowing machine connected, invented and manufactured by the exhibiters; and a one-row lever hand mangel-wurzel and turnip drilling machine, invented, improved, and manufactured by the exhibiters.

HENRY HUMPHRIS, of Sandford, Charlton Kings, near Cheltenham, Gloucestershire.

Three sizes of a one-horse cart for general purposes; a two-horse waggon for general purposes; a horse hoe on the ridge; a box barrow for general purposes, with dash-boards, and a navvy's barrow, with dash-boards, all manufactured by the exhibiter.

MARYCHURCH and Son, of Haverfordwest, Pembrokeshire.

A small occupation corn drill; a horse drag rake, and corn crushers known as No. 1 and No. 2, improved and manufactured by the exhibiters; two sizes of a turnip cutter, invented by James Gardner, of Banbury, and manufactured by the exhibiters; a patent horizontal double-action turnip cutter, (this machine received the prize of the Royal Agricultural Society at Shrewsbury in 1845); and a patent horizontal single-action turnip cutter, invented by Charles Phillips, of Bristol, improved and manufactured by the exhibiters; three sizes of chaff cutters, improved and manufactured by the exhibiters; two specimens of a two-wheel iron plough, marked G L and W A, invented, improved, and manufactured by the exhibiters; two specimens of a swing plough, marked P M and S C, manufactured by the exhibiters, an iron stand, invented and manufactured by the Colebrook Dale Company, of Shropshire; a pair of scythes; a set of draining tools, and a set of tools, comprising fork and two spades, manufactured by Thomas Eveson and Son, of Stourbridge.

JOSEPH LONG, Guernsey.

Several casks of sheep dressing composition, termed "Long's Specific," invented and manufactured by the exhibiter; a dressing fork, of the size most convenient for use, invented and improved by the exhibiter and manufactured by Henry Inskip, of Potton, Beds; two dressing bowls, made of wrought iron and glazed, not liable to be broken when in use, and two pouring cans, of size and shape most convenient for use, invented and manufactured by the exhibiter.

RICHMOND and CHANDLER, South John-street, Liverpool, and Salford, Manchester, Lancashire.

Four specimens of a chaff-cutting machine; (new implement) a chaff cutting machine (No. 4 Scroll); a corn crusher (No. 1, and others No. 2 and No. 3); a grain and linseed crusher (No. 2, and another No. 4); a root washer, and an improved steam apparatus, all invented, improved, and manufactured by the exhibiters; and two sizes of a patent sack holder, invented by Henry Gilbert, of London, improved and manufactured by the exhibiters.

JOSEPH SEAMAN, The Marsh Foundry, Ipswich, Suffolk.

A Suffolk broadshare plough; an improved scarifier; a set of heavy serpentine harrows, and a set of light serpentine harrows, all invented and manufactured by the exhibiter.

EDWARD WEIR, 16, Bath Place, New Road, London.

(New implement) a turbine or horizontal water wheel, invented by M. Fourneyron, of France, improved and manufactured by the exhibiter; a circular saw table and boring machine, improved and manufactured by the exhibiter; three specimens of an irrigator; liquid manure pump; fire and garden engine; (new implement) a hose reel, for laying down and coiling up flexible hose; (new implement) samples of newly-invented vulcanized India-rubber canvas hose pipe; (new implement) a length of wrought iron pipe for liquid manure and water; a portable liquid manure pump; tripod stand, and flexible pipe; a liquid manure pump, flexible pipe; and clip to affix pump to manure or water cart; a draining level; (new implement) a drain level, with stadia or distance measurer and staff, and (new implement) a workman's level, all invented and manufactured by the exhibiter.

JAMES WHITE, of 266, High Holborn, London.

A wheat mill, with flour-dressing machine attached; a universal mill, for grinding barley, beans, peas, &c., for stock feeding; a bean splitter, on iron frame; and an oat and bean crusher, on iron frame, all manufactured by the exhibiter.

WILLIAM BUTLIN, of Northampton.

A five horse power portable steam engine, invented and manufactured by the exhibiter.

THOMAS GIBBS and Co., the Seedsmen to the Royal Agricultural Society of England, of the Corner of Halfmoon-street, Piccadilly, London.

A collection of various agricultural seeds, including samples of the various grass seeds adapted to laying down land to permanent meadows and pastures; also samples of the same, when mixed ready for sowing, samples of Italian ryegrass, perennial ryegrass, annual ryegrass, and the clovers, &c., and both for permanent and alternate husbandry; white Belgian carrots, red Altringham and other carrots; Gibbs's large parsnip; yellow globe, long red, and other mangel wurzels; purple top and other Swedish turnips; Gibbs's green top yellow hybrid and other turnips; large drumhead and other cabbages; Kohl Rabi; and several hundred samples of various seeds; and a collection of dried specimens of grasses, and samples of agricultural roots.

JAMES DOBBS, of North Molton, near South Molton, Devonshire.

Two specimens of three brass spirit levels, invented by the exhibiter, and manufactured by James Floyd, of Oxford.

GEORGE BRUCE, of 52, Nelson-street, Liverpool, Lancashire.

Specimens of black japan varnish; blue coloured composition; red coloured composition; green coloured composition; stone coloured composition; and transparent varnish, invented, improved, and manufactured by the exhibiter.

GEORGE GIBBS, 26, Down-street, Piccadilly, London (under the Firm of George Gibbs and Co., Seedsmen to the Royal Agricultural Department of Belgium, and Corresponding Members, and Seedsmen to the Agricultural Society of Zealand in the Netherlands).

A collection of dried specimens of grasses: a collection of wheats, barleys, and oats in the ear; samples of their mixtures for laying land down to permanent meadow and pasture; and samples of swede, hybrid, and common turnips, mangel wurzel, carrots, clovers, tares, sainfoin, flax, and a general collection of various agricultural seeds.

JAMES TREE and Co., 22, Charlotte-street, Blackfriars Road, London.

A cattle gange, and key to the weighing machine, invented by John Ewart, of Newcastle-upon-Tyne, and manufactured by the exhibiters.; and the improved draining level, invented now Mr. A. Chislett, of London, and manufactured by the exhibiters.

GEORGE CHIVAS, Chester.

Specimens of "orange jelly turnip," introduced by the exhibiter.

THE OVER-FED BREEDING STOCK QUESTION.

While we fully agree with the impropriety of over-fed breeding animals, a few words of caution against arriving at hasty conclusions may not be out of place, since the grand desideratum at issue is a problem not so easily solved as many imagine; for, although we have not seen the Gloucester meeting as yet, nor heard a whisper about the quality of the stock when we take up the pen, still, from our experience in rearing and feeding stock for the summer meetings of the Royal Agricultural Society, we will readily admit that over-fat beasts are shown, and unceremoniously condemned, along with the exhibitors, as usual. Stallions, bulls, and rams will be in such "a diseased state" as to unfit them for propagating their species, however favourable may be the condition of mares, cows, and ewes; while the latter will be as barren as if spayed, whatever may be the condition of the former. "Food has been wasted," it will be said, "for the express purpose of unfitting them for the object for which they are exhibited." And anomalous as such may appear, it would be absurd to deny the fact, extenuate the impropriety of the practice, or diminish the loss sustained. But the grand question remains to be solved: How can it be otherwise without incurring an equal, if not greater, loss? For farmers do not rear live-stock for the mere sake of numbers or pleasing the eye of superficial observers, but for butcher-meat and dairy produce; and how can these results be obtained in the highest degree without first having ascertained the disposition of breeding animals to develope muscle and fat. In short, when our inquiry extends to the facts of the case, or when we get below the surface of things, as it were, so as to perceive the roots of our subject, the task of those who are improving our breeds of live-stock will at once be seen surrounded with difficulties of no ordinary magnitude, for a laudable effort may turn out a failure, comparatively speaking, and an invaluable experiment a very expensive lesson; and, therefore, it is surely no more than prudent and becoming towards our teachers to be cautious in passing hasty conclusions on their conduct. If parties spend thousands for our information, the least we owe them is our best thanks.

It sometimes takes a good judge to determine when a milch cow has attained a degree of fatness to exemplify her flesh-growing qualities; for long before she has attained to this, she may even be too fat for conception, to say nothing of parturition. Innumerable examples might be quoted in proof thereof. We ourselves have farmed extensively on our own account, and more so for others, from both of which examples may be given. We shall take one from the latter, as being the most interesting. In this case it was not pailsfull of bluish water and lumps of fat that were required at the Castle. Unsightly lean cows were not wanted, however fine the symmetry and quality of skin and bone might be; and after well-conditioned ones with a propensity to fatten get beyond a certain point, it is no joke getting the necessary quantity of cream from them to pay their keep. With facts of this kind farmers have long been familiar. A difficulty is experienced at both the periods of bulling and calving, to keep cows in a proper degree of fatness for the purposes of breeding and giving milk only; but bullocks are subject to neither of the calamities involved, while old cows themselves require to be fattened for the shambles as well as they, both inheriting the peculiar propensities of their sires and dams, in laying on fat properly or improperly, so that the butcher-meat view of the question ought never to be lost sight of in the rearing of stock. Our example is as follows:—

Two cows, Dahlia and Sunflower, were selected for exhibition at one of the summer meetings; both were subject to the conditions just mentioned, being, in the language of the herdsman, "more trouble than all the others put together at bulling and calving time." They were, however, the flower of the herd; *requiring the least keep, and giving the best milk and calves.* And the next practical question was, which of the two would give the best beef? Opinions here were widely different, the vast majority, including the agent, an excellent judge, being in favour of the latter; but we ourselves, with one or two other experienced breeders, gave our award in favour of Dahlia, which ultimately carried off the first prize in her class, while Sunflower was not even awarded merit. But at the period in question it was not so easy to determine the merits of the two as in the show-yard, for the defects of the latter had not yet manifested themselves in a very high degree; while those of the former were exemplified more conspicuously at the first period than the last. Both were over fat for breeding, having been bulled several times to no purpose; but neither of them was fat enough to de-

termine their flesh-yielding qualities. Dahlia was somewhat coarse in the neck and head, but other points fine, while she afforded every indication of yielding finely-marbled meat. Sunflower, on the other hand, was perfect in symmetry from the tip of the horn to the point of the tail, so to speak, but manifested a slight disposition to lay on fat unequally, yet so small in degree as not to be perceptible by the majority; while some experienced judges were of opinion that she would get better, instead of worse, if fattening was carried further, while the opposite might be the case with her opponent. Whatever was our own opinion on the subject, these latter conclusions were such as could only be settled by experience satisfactorily. Hence an additional quantity of food was given, and the cows fattened to as high a degree as we thought they would be admitted into the yard with credit to the establishment. It would have been an easy matter carrying them much further, but this was not desirable. During the process of feeding, Dahlia got better and better every day, while Sunflower got worse and worse; but not in an equal degree; for instead of mixing the fat proportionably better as she got fatter, as some had expected, the reverse was the case. But even when sent off to the show-yard, appearances were so trifling in the eyes of her admirers, that few of them changed an opinion, although in our mind the result was a settled question upwards of a month beforehand. The case of the former was inversely from this; for although her head and neck remained equally objectionable, yet the hair upon them became more and more short, sleek, and glossy, while her carcase filled up so barrel-full of finely mixed meat, as almost to leave the judges no alternative but to give the prize, whatever had been the defects of the head and neck. She was the fattest of the two; but the other carried her fat more conspicuously, and hence was more loudly condemned in the yard as being too fat for a milch-cow, while she almost escaped censure. Neither of them was, however, burdened with fat, both carrying it with ease, having travelled on foot nearly ten miles without lowering their spirits, being as lively and hale in the yard as at home in their feeding-boxes.

In this case feeding to a certain extent beyond what was necessary for breeding or dairy purposes was absolutely necessary; and the question now remains to be answered, was it carried too far in the case of Dahlia? For some time prior to the meeting, good judges would have had no difficulty in settling the question between her and Sunflower. Ought the process of extra feeding to have been stopped as soon as this point was capable of solution? Had the competition lain between the two cows the answer was obvious; but such was not the case, for it now lay between Dahlia and a third cow, of which we knew nothing. Her fattening qualities were not more than sufficiently developed to show the value of her progeny for the shambles, and therefore we can hardly see how the condition could have been otherwise than it was. But a more practical answer may be given to the question, for the agent differed widely from us as to the merits of the two cows, so that Sunflower was actually sent to the meeting to carry off the prize! Instead of having lost ground, he thought she had rather gained on her opponent in the process of fattening, so much do doctors differ; so that the two in some measure represented two parties, though only one interest, and instead of meriting condemnation for being over-fat, stood in the show yard two invaluable examples, each reading its own important lesson to those qualified to discriminate between the difference of their dispositions to lay on fat, the difference of their symmetry, and the causes which produced those differences. It were difficult to say which of the two exemplified the most important instruction, so that those who went to the yard to praise the one and condemn the other might just as well have stayed at home.

It may be said that extra feeding is unnecessary; that milk cows should be exhibited in a state fit for breeding for dairy purposes only, and not for butcher-meat; that "fat hides faults;" that symmetry and quality of bone would be more easily determined in a lean state than when fat; and that judges could have settled the question between the two cows, as to flesh-growing qualifications, before they were put on a more liberal allowance of food.

Such is plausible in theory, but it involves errors in practice which very briefly overturn the whole; for, in the first place, the argument that "fat hides faults" just presupposes that judges are unfit for the duties of their office, for he is a blind judge who cannot distinguish between fat and bones—hollows filled up with fat from bones properly covered with flesh. No doubt it tests the notions of superficial judges—men who have got good eyes and hands it may be, but "bad heads"; but such is no argument, for sound judges require good heads also. In the second place, *it effects a separation between science and practice*, placing the disposal of facts at the mere mercy of opinion—a course which must ever be condemned by practical men; for if a farmer cannot judge properly of the quality of the flesh when formed upon the bone before him, how is it possible that he can judge of it better prior to its existence upon the bone? Objections of this kind are absurd; and those who advance them may just as well say that our domestic animals should be bred for the sake of heads and tails only.

We might have quoted similar examples of prize sheep exhibited by the noble Duke our employer at the same meeting, whose faults, both in the flesh and wool, did not develope themselves until the animals were too fat for the mere purpose of breeding only. But enough has been said on this point to show the object we have in view. Both tups and ewes had to be reduced in flesh before being put together in autumn. Quantity and quality of wool and mutton cannot be lost sight of, in the breeding of sheep, any more than quantity and quality of beef in the breeding of oxen. The difficulties with which the practice is surrounded show the enormous expenses and trouble incurred by breeders in the improvement of live stock, the grand object of the Society; and instead of their short comings—as we have already said—meriting censure, they only open a wider and more fertile field of inquiry for the exercise of every intelligent mind.

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But although the butcher-meat view of the question should never be practically lost sight of, in the rearing of stock for breeding purposes, yet, as at the Smithfield Club shows, there is a limit beyond which the "forcing process of feeding," as it has been termed, cannot be judiciously carried in the case of breeding stock for rearing for the shambles at the summer meetings of the Royal Agricultural Society; and this limit appears to be more narrowly circumscribed in animals which have not arrived at maturity of growth than in those beyond this period; for while a liberal supply of fat is favourable for the lubrication of bone and muscle, yet an excess of the former interferes with the proper development of the latter while growing. And besides this, the starving process, so to speak, cannot be so successfully carried out before the different sexes are put together, there being a greater risk of impairing the constitution, leaving the breed degenerated instead of improved. The Shetland pony and ox are results of the starving process. A young bull of the stock of the above cows entered the yard with them, and carried off the first prize in his class. In this case we readily admit having carried the process of fattening too far; for although the animal took its daily exercise at home with ease—entered the show-yard as lively, sportive, and frolicsome as good health could possibly indicate—yet when returned home for duty he was not what he would have been had his treatment and condition been otherwise. A loss was sustained. We were perfectly aware of the dangers before us, and used, we believe, every caution to avoid them—save one, less food—the extra-fattening qualifications of the animal having led us too far. The example was an instructive one to us, and ought not to have been otherwise to the public. But while we admit that our young bull was too fat, and much fatter than any of his compeers in his own class, he was suffering less from fat than they; for had he been no fatter than the fattest of them, no loss would have been sustained: a fact which introduces another view of the question before us, which our present limits will not allow us to do more than mention—viz., that the society will find it no easy task to successfully specify a given degree of fatness for stock at its summer meetings, owing to the diversity of constitution and aptitude to fatten. Difficulties must be experienced, and honestly disposed of.

When the above was written we had had not seen an "Ex Judge" letter, nor were we prepared to receive objections to the new proposition of the Royal Agricultural Society from such a source—a proposition which has been too narrowly construed, and perhaps somewhat too ambiguously expressed; for "over-fed condition," and "too fat for breeding purposes," may be two very different things in practice. For example, the majority of the prize cows and ewes at Gloucester were too fat for calving and lambing, but not too fat for practically developing the improvement of live stock—the grand object of the Society. We quoted Dahlia as an example of this kind, and the young bull as the opposite "over-fed condition"—one which ought therefore to have been disqualified. "Over-fed" is too generic an expression, and, from the volubility of the English language, a more technical term we think might be adopted. In short it is a disease, ought to have a technical name, and must be cured if possible. B******.

ON THE DISQUALIFICATION OF ANIMALS FOR BEING OVER-FED.

Sir,—Freedom of discussion, and opinion properly exercised, are universally allowed by right-thinking men as great conservatives of all that is good. Desiring to descant a little on the subject of my text, without any intention of giving the slightest offence to any man or body of men, I trust you will kindly allow the insertion of this letter in your next number.

In common with many other breeders of various kinds of animals, I am of opinion that this new rule of the Royal English Agricultural Society, in its present shape, is dangerous to the best interests of the society, inasmuch as it is inferred that the exhibitors, one and all, keep their stock upon any and all kinds of food (drugs, &c., excepted) not forbidden by the rules.

My 52-months'-old ram being disqualified at Gloucester led to much criticism as to how long he had been fed, and on what food, &c., &c., &c., and what work he had performed. My shepherd was asked if I fed with aniseed, fenugreek, mutton suet, cream, or gin. Now I assert that my sheep has not been begrudged a good dinner, but has never at any time been indulged with either of these delicious morsels as a dessert. If those things are resorted to, as was unscrupulously asserted to my shepherd, and in part to myself, I would very humbly suggest that there is a wide field open for inquiry; and if proved to be true, great necessity for the society to take some effective means to prevent injury to the generative powers of animals so fed, and an unfair competition, by which injustice is done to individual exhibitors, and the object of the society frustrated. It has already forbidden the use of milk—why not prescribe a general dietary, and expel every exhibitor who may be proved to have infringed the rule?

I do not make any accusation, by implication, against any person, for I have no knowledge of my own of the existence of the practice alluded to. I am fully aware that there are breeders who consider it a high honour to be disqualified, but as others may in consequence be deterred from attending my sale on the 2nd August, I feel justified in saying that my 52-months'-old Cotswold ram has done three hard rides—1st, near Daventry, Northamptonshire; 2nd, near Newport Pagnel, Buckinghamshire; 3rd, near Northleach, Gloucestershire; and the two latter seasons he has tupped 82 and 80 ewes respectively, has given entire satisfaction in the number of lambs produced, has not returned home till nearly or quite Christmas in each year, was kept with my common tegs till nearly March last on a piece of cold sand, was

exhibited at Oxford early in June last, took the prize there, at the same time met with an accident, which has caused him to be lame in the near hind leg ever since, or he would now be much fatter. All this I am prepared to prove by unexceptionable evidence, if required, and feel perfectly satisfied with my fate under such circumstances, determined as ever to endeavour to produce others with similar form, quality, and constitution, not fearing disgrace by being plucked.

Here I should have ended, but at this moment your leading article informs me that (with another) my sheep "could by no means be induced to get on his legs." I admit that his docility and aptitude to fatten often induce him to "recline," but you might have seen him on his legs very often during the show, and, had you been there, you would have seen him walk through the mud from one end of the yard to the other, on leaving it on Saturday; and, lame as he is, he walked a quarter of a mile (measured) this morning in 15½ minutes.

Whoever supposes that sheep at 16 months' old are produced the weight they are without great attention, and an unlimited supply of the best food (pampered, if you please), can know but little practically of breeding and feeding; and those who believe my sheep has been kept better than those in his class may rely on it they are woefully mistaken.

A heifer is not allowed to receive a prize awarded till she has produced a calf; and probably the jury would not have disqualified my sheep had they known all the facts relating to him.

I trust I am serving a right cause by these remarks, believing that the society has much to do before it arrives at the most certain conclusions, which by continued perseverance are within its reach.

I am, sir, your obedient servant,

WM. COTHER.

Middle Aston, Woodstock, July 19, 1853.

CALENDAR OF AGRICULTURE.

This month may be called the general harvest one, as all kinds of grain will be cut and carried, except in high situations and in northern latitudes. Wheat is cut by sickle, and tied in sheaves; barley and oats are mown, and may lie some days in the swathes before being tied into sheaves; when dry, carry the grains quickly. Turn the heaps of peas very often; do not allow any mouldiness on the under side. Store peas with little superincumbent pressure. Have plenty of thatch always ready.

In late climates, the sheaves of grain must be made small in size, and may be very beneficially built into small ricks of three or four shocks in the field, to stand there till dry enough for being carried.

Cut all grain crops before dead ripeness happens; the straw makes better fodder, the sample of grain is better, and the meal is finer. The husks being thoroughly filled, the grain will soon become hardened.

Finish the cleaning of all green crops, and earth-up potatoes by two furrows of the double mould-board plough, drawn by two horses walking in distant furrow, with a main-tree of five feet stretching between them. A week may elapse between the two furrows of earthing up. Pull by hand any tall weeds that may afterwards arise.

Lay pulverized lime on clay fallows; harrow and plough it into the land lightly, or lay the shells on the land, and plough them in; they will burst and fall to powder by reason of the moisture in the land, and the subsequent ploughings and harrowings will mix the lime and the soil. This very valuable method of laying on lime requires an earlier application in the last month. Lay farm-yard dung on wheat fallows, spread it evenly, and plough it in without delay; or drill the land with one furrow of the common plough, spread the dung in the drills, reverse the drills with a single furrow which will completely cover the dung. A cross harrowing is required to level the drills before the land is seed-furrowed. When wet clay-lands are ploughed, the cuts across the headlands must be very carefully opened, to convey the water to the ditches.

Supply to horses and cattle in the yards ample store of vetches, which will now be very good food from the pods being seeded; provide litter in abundance, the manure produced will pay almost any cost.

Fold sheep on bare spots of poor pastures; go on with draining; turn over earthy composts; burn peaty and vegetable substances for ashes as a manure to be used by the drill; keep the liquid tank filled with earthy substances to be saturated; carry to the pit refuse matters of every kind.

Keep the draft ewes on good pasture in order to get them fattened; put ewes to the ram for early lambs. The lambs of last spring must have good keep. Some farmers, who have not winter food, nor the means of fattening, now sell the lambs and the draft ewes.

Sow on beds of rich and well prepared lands the seeds of drumhead cabbages, kohl rabi, savoys, and brocoli, for plants to be used in May; sow about the end of the month rye and tares, for early spring use.

METEOROLOGICAL DIARY.

	Barometer.		Thermometer.			Wind and State.		Atmosphere.			Weat'r.
Day.	8 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Jun. 23	29.70	29.84	51	69	56	Northerly	gentle	cloudy	sun	fine	dry
24	29.83	29.80	52	76	63	W. by South	var.	fine	sun	fine	showery
25	29.80	29.76	56	66	57	Do. Northerly	var.	fine	sun	fine	showery
26	29.66	29.63	56	67	54	NortherlyS.W.	brisk	fine	cloudy	cloudy	wet
27	29.64	29.64	56	70	59	W.S.W.	high	cloudy	cloudy	cloudy	rain
28	29.71	29.62	59	69½	61	W.S.W.	brisk	cloudy	fine	cloudy	dry
29	30.70	29.80	57	68	55	S. West	brisk	cloudy	sun	fine	dry
30	29.80	29.72	53	68	53	S. West	var.	cloudy	sun	fine	showery
July 1	29.75	29.74	47		53	W.S.W.	lively	fine	fine	cloudy	showery
2	29.98	30.16	48	67	53	W.N.W.	gentle	fine	fine	fine	dry
3	30.23	30.22	50	65	58	W. by N., N.	var.	cloudy	sun	fine	dry
4	30.22	30.10	51	68	56	S. Westerly	gentle	fine	cloudy	cloudy	dry
5	30.18	30.00	55	70	57	S. Westerly	gentle	cloudy	sun	fine	dry
6	30.00	29.96	56	74	63	S. West	gentle	cloudy	sun	cloudy	dry
7	29.98	29.90	58	83	70	Variable	gentle	cloudy	sun	cloudy	dry
8	29.94	30.02	62	83	66	Easterly	lively	cloudy	sun	cloudy	dry
9	30.92	29.92	62	70	59	S. by West	lively	cloudy	fine	fine	showery
10	29.99	30.01	56	64	55	Westerly	gentle	cloudy	cloudy	fine	dry
11	30.61	30.02	51	68	59	S. West	lively	cloudy	fine	fine	dry
12	30.02	29.99	52	72	58	W. by S., S.W.	fresh	fine	sun	fine	dry
13	29.91	29.53	53	73	60	S.W., East	fresh	fine	fine	cloudy	dry
14	29.38	29.26	52	56	54	E.by S., Westly	brisk	cloudy	cloudy	fine	rain
15	29.37	29.60	51	65	52	Variable	brisk	cloudy	cloudy	fine	showery
16	29.62	29.62	50	63	56	S. West	strong	cloudy	cloudy	cloudy	showery
17	29.84	29.93	53	66	56	S. West	var.	cloudy	sun	fine	showery
18	29.94	29.87	50	63	56	S. West	brisk	cloudy	cloudy	fine	showery
19	29.91	29.99	53	69	58	W. by North	gentle	fine	sun	fine	dry
20	30.01	29.95	52	66	56	W. by South	fresh	fine	fine	cloudy	dry
21	29.90	29.83	56	67	59	S.S.W.	gentle	cloudy	fine	cloudy	dry
22	29.76	29.84	57	65	59	S. by W.	gentle	cloudy	cloudy	cloudy	rain
23	30.00	29.98	52	73	58	S.W.	gentle	fine	sun	fine	dry

ESTIMATED AVERAGES OF JULY.

Barometer.			Thermometer.		
High.	Low.	Mean.	High.	Low.	Mean.
30.30	29.39	29.874	76	42	61

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
68.66	55.77	62.215

Weather and Phenomena.

June 23. Pretty fine. 24. Thunder and showers; red sunset. 25. Wet; heavy, driving shower clouds. 26. Changeable; wet evening. 27. Warm drying wind; evening shower. 28 & 29. Still windy; more sunny. 30. Fine till noon; then alternate gleams and showery.

Lunation.—Last quarter, 6 h. 36 m. morning.

July 1. Showers; sunny intervals. 2. Improved. 3. A drying day; wind changes. 4 & 5. Changeable; clouds prevail. 6. Much hotter; close air. 7. Very oppressive; lightning; a prodigious thunder storm from 11 p.m. to 6 a.m. 8. Still warm; but rain threatens. 9. The weather broken up. 10. Some rain; gloomy. 11. Changeable; sunny p.m. 12 Summer temperature. 13. Warm day; wet night. 14. Much heavy rain; fall 2 *in.* 80 *cts.!!* 15. Thunder at 2 p.m.; prodigious showers. 16. Wind; many smaller showers. 17. Improved; brisk wind; wet at sunset. 18. Heavy driving clouds and showery. 19. Improved; a small sprinkle. 20. Fine lively day. 21. A mere hint of rain. 22. Slight drizzle till noon. 23. Beautiful sunny day till 4 p.m.; then threatening western clouds.

Lunations.—July 6th. New moon 10 h. 54 m. morning. First quarter, 13th day, 10 h. 15 m. afternoon. Full 20th, 1 h. 54 m. morning.

Remarks connected with Agriculture.—The weather will prove that haymaking must have severely suffered. Yet in our favoured well-drained localities much has been secured. Corn has not been much injured by the heavy thunder storms: yet the low temperature has retarded its advances. The weather remains changeable and uncertain even to this night, and already the rain table reports 4 in. 75 cents. to have fallen already during July.

CALENDAR OF HORTICULTURE.

General Remarks. — Preparation for another year, though inseparably connected with gardening at all periods, yet is now more than ever the business of the day: in fact, the most important operations now to be performed have, for their ultimate object, the requirements of another year—whether these be sowing vegetable seeds or putting in cuttings. Certainly something yet requires doing to keep the various compartments in order, but these duties are but secondary to those of providing for the exigencies of another season; it is therefore important to bear in mind that any delay in the latter is sure to be attended with bad consequences. We therefore advise the propagating of hardy and half-hardy plants to be begun in earnest, and to be proceeded with at all favourable times; and though it would be wrong to advise any neglect in the way of preserving good order in every department, yet we would for the moment sacrifice present appearances rather than lose the season so necessary to ensure a nice lot of rooted Geranium cuttings, batches of good Strawberry plants for forcing, beds and quarters of nice cabbage Lettuces or Endive plants, and the innumerable *et ceteras* which constitute the work of the present season.

Plant Department.

Conservatory.—The great bulk of the Geraniums which for a considerable time will have kept up the show here, will now require cutting down, and the cuttings to be put in of such kinds as it is advisable to propagate; in a usual way it is common to propagate more than is wanting for pot culture. The wants of the flower garden or the requirements of a neighbour, as well as the losses likely to be incurred during winter, must all be provided for. When not wanted for early and large plants, Geraniums strike tolerably well in the open ground, only shaded a little from the hot sun; but favourite kinds may be inserted in separate small pots, and then plunged in heat, and of course they will root more quickly. Give little or no water to the cut-down plants for some time, and if heavy rains occur, let them be protected; if no better way presents itself, let the plants be laid on one side. The *fancies* will not bear cutting down so severely as the other kinds; these must therefore only have a sort of thinning or pruning in, retaining not only a great many leaves, but also a number of the shoots their full lengths or nearly so. An open, airy place, free from warmth, will suit the whole, and they may be placed there on some of those dull days, of which the season hitherto has been so prolific.

Stove.—The absence of anything like a lengthened period of sunshine has been more congenial to the blooming process than to the ripening of the wood or hardening the tissues of the various plants here, which is so necessary to meet the wants of another year; consequently all the artificial means available must be resorted, to in the way of compensation for this. The shading, whether by canvas or creepers, must be removed or nearly so, and the glass cleaned, in order to allow the plants the full benefit of what sunshine may yet be left to us: the house being, as we presume, more thin than usual, will also assist in affording more light to each specimen. Be particularly careful not to overwater them, and let cleanliness prevail everywhere.

Forcing Department.

In a usual way this ought to be a dead letter, or nearly so, at this season; but in the present one, the usual heating appliances can hardly have even been dispensed with, so that "forcing" may literally be said to be yet going on.

In the *Pinery* see that the heating contrivances do not rob the bed or pots of any part of the necessary moisture; if so, let it be renewed as occasion requires. Keep up also a good atmospheric heat, in fact at this season a bottom heat of 85 degrees or more will not be too much, and top heat with a minimum of 10 degrees less will not be over-done, which may also at times range up to 90 degrees. in bright sunshine: absence of warmth is incompatible with quick growth.

Thin the Grapes in the late-houses, and give abundance of air; adopting every contrivance that can be done to keep away insects, mildew, &c., and keep the shoots stopped to a leaf or so above the fruit, and all useless laterals cleared away, giving also frequent waterings to the floor.

Flower Garden.

A considerable pruning of the China and other early-flowering Roses will now have to be made, to induce a fresh growth to flower in September; and if the plants seem exhausted, a good application of manure water will be of service. Keep tying up Dahlias as they advance—not, however, in a tight, close manner, but loose, open, and natural. Hollyhocks will also want similar assistance; and many other herbaceous plants, as Phloxes, Asters, &c., will want a little tying up, to preserve them against heavy rains and winds. Cut other plants down that have done flowering, and remove annuals, &c., no longer showy. Observe the beds of Tree and Neapolitan Violets, and remove suckers from plants

wanted to force in winter, and give a dressing of sulphur to such as are infested with red spider. Layer Carnations of the most choice sorts; but most kinds strike freely from cuttings, which if put in a pot or frame, and plunged in heat, quickly become nicely rooted plants with less than half the trouble attending layers. Pinks which were put under hand-lights, &c., some time ago, will now be rooting apace, and must be transplanted ere they get too much drawn; they must, however, be previously inured to the open air, and then planting out must be done in dull and damp weather, taking care likewise that the slug and other enemies, so prevalent this season, do not prey upon them. Keep all low-growing plants in their proper places, which judicious pegging down and stopping will assist very much. Petunias are apt to overgrow their proper bounds, and so are some of the more rampant Verbenas: these by pruning and stopping may be kept much at home. A few short bushy stakes may be thrust in amongst some of them, to keep them in their proper places; for high winds are apt to turn over and break such things as Anagallis and many other plants. Bushy sticks, somewhat larger, may also be put amongst Salvias, Ageratums, and other tall-growing, bedding plants; not that they always require such supports, but as they are sometimes liable to take a leaning one way, a few stakes put in (unseen) will assist in the equilibrium. Keep the grass and walks in good order, and let everything have the air of good keeping, without which the choicest plants and best-arranged parterres cease to be attractive.

KITCHEN GARDEN.

Although there will appear but little ground vacant at this season in a well kept garden, yet whatever is empty must be speedily set to work again. Large breadths of Broccoli may yet be planted and in some cases even Peas may be sown with advantage; for we have seen a fair useful crop from some put in the ground on the 7th August. Let all spare ground be therefore judiciously planted up immediately, and give every attention to such crops as are in the ground, for the present season is unusually prolific in slugs and other enemies, so that more than ordinary care is requisite to protect growing crops against them. In a usual way it is better to plant in dry weather than in damp, where these marauders are so abundant, as their locomotion is much impeded when the surface of the ground is dry. Keep all parts of the ground in good order, and let no crops remain on the ground after they have ceased to be useful. Run away Spinach; Lettuces, &c., ought all to be removed at once, for independently of their untidy appearance, they rob the ground of that nourishment which the careful horticulturist will be most anxious to retain.

W.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR JULY.

The advices at hand during the month just concluded are of a character calculated to have considerable influence upon the value of all agricultural produce for some time to come. In the first place we may observe, that owing to the highly prosperous state of the country, and consequently of our home and foreign trade, the advanced rates of wages now paying in most parts of the United Kingdom, the great abundance and low value of money, together with the enormous imports of gold, the consumption of the better kinds of food —notwithstanding the emigration still going on— is rapidly increasing. In the next, it is obvious that in consequence of the comparatively small breadth of land under culture, the growth of wheat this year must of necessity be a very moderate one. These circumstances have had considerable influence upon our markets, and the value of all agricultural produce has, as might have been anticipated, been materially on the advance. The threatened rupture between Russia and Turkey—the probability of hostilities being commenced between England and the former power—and the consequent stoppage of our supplies of grain from Southern Russia and the Upper Baltic, have all tended to give increased stability to the corn trade; whilst the extensive purchases of floating cargoes of wheat effected on French and Belgian account have drawn from the United Kingdom supplies which may be required here at no distant day. Then again we have had a relaxation of the corn laws in France—in other words, those laws have been abrogated so far as England is concerned; corn imported in English vessels being allowed to enter French ports on the same terms as in French bottoms. The prohibition issued against the export of wheat, barley, and maize from the Two Sicilies, has tended to give increased confidence here. So far, therefore, as the present state of the corn trade is concerned, there is every reason to congratulate our farmers; but when we calmly consider the prospects of the present crop, we fear that there is every reason to anticipate but a very moderate return. That the wheats are extremely

backward, and comparatively short of straw, does not admit of a doubt; whilst the heavy rains and high winds have done serious damage in many quarters. The cutting of wheat cannot be commenced for some weeks, except in the most forward districts; and we are of opinion—notwithstanding that the blooming time passed off tolerably well—that the acreable yield will not exceed an average. We have, however, rather more favourable conclusions to draw from the general appearance of spring corn. The humidity of the atmosphere during the greater portion of the year has no doubt had a beneficial influence upon barley, oats, beans, and peas, more especially upon light soils; hence, as far as we can ascertain, the yield of those crops is likely to be a good one—perhaps considerably in excess of some former years. On the other hand, however, the superabundant moisture has done some serious damage to the potatoes. Accounts differ materially in this respect; nevertheless we have good authority for stating that a large portion of the crop has been lost, the haulm as well as the tubers having shown unmistakeable signs of rot. It is doubtless too early for us to determine anything like the amount of loss, but a portion of it will no doubt be made good from the unusually large extent of land under potato culture. It may be said that this was the line of argument we took last year. True; and the result proved that it was a correct one; because we find that our markets were somewhat liberally supplied during the whole of the winter, and even within the last six weeks old potatoes, both English and foreign, have made their appearance in some abundance. The new sorts disposed of, up to the present time, have been in fair average condition; but really fine parcels have produced rather high prices. We have letters from the continent, in which the writers, while commenting upon the great exertions made in France and Holland to supply our markets, and describing the quantity of land under potato culture as usually large, make no mention of disease even in the worst districts.

The extensive floods have been productive of severe losses to the hay-growers. In many parts of the country immense quantities of hay have been carried away and lost, while the long exposure in the fields has materially damaged a considerable portion of the crop. The markets have, therefore, been very scantily supplied with both meadow and clover hay, and a considerable advance has taken place in prices—the former having realized £5 5s., and the latter fully £6 per load, for the best qualities. In some parts of the country, even higher rates than those above quoted have been paid. The stocks of last year's hay and straw on hand are now greatly reduced.

The supplies of old wheat in the hands of the farmers in most parts of the United Kingdom are by no means so limited as at the corresponding period in 1852: but this feature has arisen from the larger quantities of foreign taken into consumption, and the low condition in which most of the English wheats have made their appearance. The wealthy holders have evinced no disposition to sell for several months past, under the impression that prices had long since seen their lowest point. The stocks of barley, oats, beans, and peas, are almost exhausted; indeed, in some districts the farmers are compelled to purchase foreign parcels to meet their requirements.

The English wool trade has continued in a very healthy state, notwithstanding the large quantities of colonial wool now offering at public sale, and the decline in the quotations of from 0½d. to 1d. per lb. As we have long since anticipated, the total clip of English wool this season has been a very small one; consequently, looking to the great demand for the article, it is fair to assume that present quotations are safe. The early fairs have, for the most part, passed off extremely well, and prices have shown an advance of from 20 to 25 per cent. compared with 1852.

The fat stock markets have been but moderately supplied during the whole of the month, and we have observed a considerable falling off in the general weight and condition of the stock on offer. The imports from the continent have been very liberal; nevertheless, the trade has ruled brisk, and prices have advanced from 2d. to 4d. per 8 lbs. Store stock has produced enormously high prices, and, in some of the leading provincial markets, lambs of only average weight have produced from 38s. to 42s. each. In Smithfield, really prime Scots have realized 5s., the best Down sheep 5s. 4d., and the best Down lambs 6s. 6d. per 8 lbs.; but these must be considered extreme rates.

The turnip and carrot crops have made very steady progress, and, up to the present time, our advices respecting them are favourable. The season for sowing being over, guano has met a very inactive demand, and prices have had a downward tendency. The imports from Callao have been very late this season, and the sale for many thousand tons has been lost in consequence. In the early part of the month, the whole of the cargoes as they arrived were delivered over-side.

There has been rather more doing in corn in the Irish and Scotch markets; but the rise in prices has not been so extensive as in England. Both beasts and sheep have been selling at very high prices, and there has been a great demand for them on English account.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Very great excitement, consequent upon high prices—the result of the rapidly-increased consumption—has been observed in the whole of the cattle markets held during the past month. On some few occasions, the supplies brought forward have been tolerably good as to number; but we have noticed a considerable falling off in their general weight and condition. This is a state of things which some persons do not understand, because they intimate that there has been abundance of keep during the last six months, and that oil-cake has been selling at very moderate currencies; but it must be borne in mind that the actual supplies of sheep in the country are unusually small, and that the present tempting prices, which to owners of sheep from two to three years old offer great inducements to sell, are calculated further to reduce them. Even the numerous importations from Holland and elsewhere are not likely much to interfere with present rates, because they are too inferior in quality for the general run of present consumption. We say "the general run of consumption," because we have the indisputable fact before us that great difficulty is now experienced on the part of even the second-class butchers in getting rid of inferior joints, for the all-important reason—and here, by the way, is the great secret of the recent important rise in prices—that the lower classes are receiving higher wages for their labour, and consequently in a better position to purchase other than inferior meat. For some months past we have contended for a high range of value; and the result of the past month proves that our impressions on this head were well grounded. As respects the future, we see no reason whatever to anticipate reduced quotations; but it is quite clear that the graziers will not be equal gainers with the breeders, the latter of whom are obtaining prices for their animals which would appear almost incredible, and which, in our judgment, will leave the graziers little or no profit.

The rains have been productive of a large supply of pasture herbage; yet there has been much activity in the demand for cakes, the prices of which have advanced fully 5s. per ton.

The arrivals of foreign stock into the United Kingdom have been on the increase, though very deficient in quality. From Spain a cargo of oxen has come to hand; but the small profit attached to the operation is calculated to check further imports from that quarter. The following are the arrivals into London:

	Head.
Beasts	5,148
Sheep	24,967
Lambs	3,365
Calves	3,429
Pigs	1,886
Total	38,795
Do. in 1852	27,008
Do. in 1851	24,082

In the same period in 1850 we received 16,089; in 1849, 16,412; and in 1848, 12,379 head. At the outports, the arrivals have exhibited a falling off. Annexed are the total supplies shown in Smithfield:

	Head.
Beasts	21,199
Cows	560
Sheep and lambs	169,920
Calves	4,315
Pigs	2,820

SUPPLIES AT CORRESPONDING PERIODS.

	July, 1852.	July, 1851.	July, 1850.	July, 1849.
Beasts	18,404	18,492	16,741	15,576
Cows	680	470	451	470
Sheep and lambs	160,190	188,170	178,550	162,900
Calves	3,746	2,520	2,908	2,615
Pigs	3,067	2,800	2,168	2,044

The bullock supplies from the northern districts, from which quarter the largest portion will be drawn during the next six months, have amounted to 2,600 shorthorns. From Norfolk, Suffolk, Essex, and Cambridgeshire, 6,000 Scots, shorthorns, &c., have come to hand; whilst the receipts from other parts of England have amounted to 2,500 of various breeds. The Scotch supply has rather exceeded 1,000 Scots.

Beasts have sold at from 3s. 2d. to (in some instances) 5s.; sheep, 3s. 6d. to (in extreme cases) 5s. 4d.; lambs, 5s. to 6s. 6d.; calves, 3s. 6d. to 5s.; and pigs, 3s. to 4s. 2d. per 8lbs., to sink the offals.

COMPARISON OF PRICES.

	July, 1852.	July, 1851.
	s. d. s. d.	s. d. s. d.
Beef, from	2 4 to 3 10	2 4 to 3 8
Mutton	2 8 4 0	2 6 3 10
Lamb	4 2 5 2	4 0 5 0
Veal	2 6 4 0	2 6 3 8
Pork	2 6 3 8	2 6 3 8

	July, 1850.	July, 1849.
	s. d. s. d.	s. d. s. d.
Beef	2 4 to 3 8	2 8 to 4 0
Mutton	2 10 4 0	3 0 4 0
Lamb	3 8 4 10	4 0 5 0
Veal	2 6 3 6	3 2 3 10
Pork	3 2 4 0	3 2 4 0

In Newgate and Leadenhall, the general demand has ruled steady, notwithstanding that the supplies on offer has been seasonably large, and prices

have been again on the advance. Beef has changed hands at from 2s. 10d. to 4s. 2d.; mutton, 3s. 4d. to 5s.; lamb, 4s. 10d. to 6s. 4d.; veal, 3s. 8d. to 4s. 10d.; pork, 3s. to 4s. 2d. per 8lbs., by the carcass.

NORTHAMPTONSHIRE.

The weather during the last month has been exceedingly wet, and very considerable damage has been done to the hay crop on the high land, and the meadows have been flooded to a larger extent than has occurred for several years past. The Valley of the Nene presents a most forlorn and wretched appearance; the hay having been drifted to the side of the fences, lying in ditches and gateways, saturated with mud; and although obliged to be removed for the purpose of drying, it still is quite unfit for food. The loss to many persons is very severe, having had from twenty to forty acres completely floated away; while the remaining standing grass is very much injured. The same effect has been produced along the small streams of the county, although in a less degree, and none but the high ground has escaped the violence of the flood. The wheat crop will be thin and light on the cold land, and the yellow maggot has commenced its ravages very generally. All the crops are wanting the sun to shine warmly, in order to bring them to maturity; and although the spring crops have improved of late, especially the beans and peas, still the harvest will be late, and the quality not likely to be good, unless we have more genial weather for their maturity. All kinds of stock sell freely at good prices. The wheat trade has advanced, and good samples have been sold at from 6s. 6d. to 7s. per bushel. In spring corn a short supply. The wool fair has been very languid; buyers wanted to purchase at a reduction of from 2s. to 4s. per tod from the advance of last month. The average price of the wool sold at Northampton fair was about 37s. 6d. per tod. It is expected that the demand will soon be more brisk, and that prices may again recover the late depression.

SOMERSETSHIRE.

We fear the gloom of the atmosphere will in some measure give a colouring to any report written under the influence of sunless days and falling rain on vegetation already suffering from excess of moisture, to say nothing about the spoiled hay, &c. Considering the rain we have had, our growing crops of corn are not much beaten down; but if it continue so wet we must expect wheat, barley, and oats to be lodged. We notice pretty generally amongst the early wheats that the red kinds will sustain a deficiency of three to four bushels per acre. The ears are certainly large; but this continued wet, at the most eventful season, must lessen the growth very seriously: we never knew it otherwise. We have noticed some rust, but as yet not to any extent; but the blight, more or less, follows an excess of rain. We can estimate our wheat crop at least one-eighth under an average, and we think this rather under than over the deficiency. Barley on good soils will be coarse, and are beaten down. Oats are looking well, but will come down, where heavy, with the rain. We have the blight amongst the beans, but we may have an average crop. Peas are fair, but all our growers want sun to ripen them, and are suffering from excess of moisture. Potatoes are growing fast, but we shall scarcely have so good a crop as last year. Our hay crops have been good, but have not hitherto been made worse for years: the land is so wet that it is very difficult to dry it. We have not had in this county floods, but the heavy thunder showers that fell last Sunday rose the water to an alarming height, but not being general, it soon went down. We had two fine days this week (Tuesday and Wednesday); some progress was made in getting in the hay, but yesterday morning we had heavy rain, and a dull, sunless day. This morning it rained again heavily from six till nearly twelve, and it has not cleared away; it is close, and will spoil much hay. Weeds grow amongst mangels and swedes faster than they can be extirpated. Should the weather clear up, some of the early wheats, barley, and beans will be fit to cut in two or three weeks; but it will be into September, even in the south country, before all the wheat will be ready to cut, unless we have unusually forcing weather. Our fallows are very backward: we cannot clear our lands; the two years' fallowing allows the weeds to increase: our wheat and other corn are now suffering severely from weeds, and if we have no time for fallowing, it will be worse next year.—July 22.

UPPER PEMBROKE AND LOWER CARDIGAN.

This month came in showery and rather wet, with fine growing weather at its beginning. There was not very great heat, although we had the most terrific thunder that we ever experienced, about the 9th, 10th, and 11th. Zadkiel predicted very near the mark for this month. There is not yet any appearance of the corn changing colour towards ripening, if we except a field of barley which was sown early—a light crop on a light soil, directly facing the sun; this is turning its colour a little this week. The crops are looking well, strong, and heavy, and the ears, according to the judgment of our farmers, are strong and healthy; indeed, the yield will be in every respect quite as good as we have seen it for many years, but it will be a few days or weeks later than usual. If the weather holds on as at present, we shall have a plentiful harvest in this part. The hay is not all secured yet; more than half of it is not secured. There is not much meadow land here, but on what there is the crop is looking well; and if the weather continue favourable, it will soon be carried in good condition. The seed hay, such as clover and trefoil, and other hay, is very good. Some very timid people think that there is something like the blight on the potatoes, but in truth we see nothing like blight yet; but the wind has cut some bits on the stalks, which, withering black, presents the appearance of blight. The stocks of the early potatoes, as they ripen, turn yellow, as in old times. The turnips are looking well, and all other vegetation, in gardens as well as the fields, has a very promising aspect. This day is fine for corn filling and ripening the ear, but not to bring it on too fast at once, as last year, but gradually. Harvest operations will commence in about five weeks from this time.—July 20.

CAMBRIDGESHIRE.

The season, since our last left us, has been so awfully wet and unpropitious—we might say calamitous—that we should not do our duty as a reporter, without making further remarks. The hay harvest has certainly proved the most distressing one ever remembered. It is not too much to say that in this county we shall hardly get one load in ten that is even tolerable, while a large portion is rendered quite worthless. Much from the meadows and low lands has been actually swept away wholesale by the floods, leaving nothing behind. In other cases, it has been driven to the nearest hedge or ditch, and there lodged, blocking up the water-courses and bridges in a most frightful form. The clovers even are not yet finished carting, and lie galling the growing crop fearfully; while the stacks have been, some of them, lying open about three weeks, in the most wretched state. The tremendous rains have also told fearfully upon all the heavier corn crops; beating some to the earth, the storms twisting others in heaps most alarmingly; and on the low grounds near the brooks and rivers, many—very many—acres have been completely covered with water, and some still remain flooded. What the effect must be, it is impossible correctly to divine; but that the most fearful losses must ensue, is inevitable. It is to be feared, too, that these almost incessant rains must greatly damage the quality of the grain generally, except on the very lightest crops. In all ordinary showery times the farmer feels some set-off to his disappointment in the hay-fields in the thought that his turnips and general growing crops are doing well. This year, however, he has no such relief; for so heavy and oft-repeated have been the rains, that the younger turnips seem stinted, the weeds only progressing, and defying all ordinary means of eradication, the horse-hoe being completely set fast, while what has been done by hand has been nearly useless, the weeds replanting themselves as fast as cut up. Nothing either (except mischief) can have been done upon the fallows of late. What the effect of so much wet weather will be upon the potatoes, is not yet fully known. The disease

has set in in some places already, and the worst is apprehended by the best judges. We appear to be about three weeks from the general harvest, although on particular spots it may commence in ten days or a fortnight. Much, however, depends on the weather. It is fairer this morning; but we have little confidence in its continuance. Our only security is that He who rules the weather is too wise to err; and, mysterious as these things are to us, sooner or later, in one form or other, although it may be in the shape of national chastisement, in the end it will be all right.—July 20.

WEST OF CLARE, IRELAND.

The severe drought experienced during the spring is now being compensated for by a more than ordinary fall of rain. For years back the month of July has been the rainy season in this part of the country, and the month now drawing to a close forms no exception to the general rule. As yet no injury has been done to the crops; on the contrary, they have been enabled to recover in a great measure the effects of the previous dry weather, and now present as promising an appearance as need be desired. The potatoes, in particular, are looking better than we ever remember to have seen them. During the past week we have had an opportunity of seeing the crop in the west of this county, during a drive of nearly forty miles, and we did not see one single field of potatoes which might not be considered above the average, both in style of cultivation and luxuriance of the crop. God grant that no disease may appear, to frustrate our hopes! for, as we have often before stated, the potato is by far the most valuable crop that can be raised by the great majority of Irish farmers: and as with its temporary destruction we saw famine desolate the land, so with its returning vitality we see around us a degree of prosperity and happiness springing up to which we have been too long strangers. The condition of the hay crop alone forms an exception to the general promise of an abundant harvest. In consequence of the rains that have continued, with scarcely any intermission, for the last month, very little has as yet been cut down, and the result will be that not only will the sample be inferior, because of the hardening of the seed stems, and consequent loss of saccharine matter, but the after-grass will not have sufficient time to perfect its growth before the approach of winter. In both respects the farmers will be losers to a greater extent than even they themselves are aware of. But there is another consideration: what if the rain should continue? The effects would be very disastrous in this district, where green crops are cultivated to only a very limited extent, and where a very large quantity of stock is kept for dairy purposes. Prices continue to maintain the former high rates, butter particularly, which has steadily held its value at from 80s. to 84s. per cwt. The only decline has been in sheep, but that was only natural, as the prices in the early part of the year were extravagantly high, and could not be expected to last. On the whole, we think that the present position and prospects of the agricultural interest are such as to satisfy even the proverbially discontented class of whom we write; and, should nothing unforeseen occur, we anticipate that the close of this year will find the Irish farmer even better off than he was at its commencement.—July 21.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ALTON LAMB FAIR.—The number of sheep and lambs penned was greater than on any former year. Business was brisk, and prices high. Mr. Parker's coop of lambs, which obtained the first prize, were sold at 35s. per head, and several coops of ewes fetched 38s. per head. Prices ranged from 5s. to 10s. higher than at last year's fair.

BROMSGROVE FAIR.—The supply of all kinds of stock was short, but quite equal to the demand. Prices were generally high.

CAMELFORD FAIR was well supplied, as usual, with sheep and lambs, which met with a very brisk sale at prices never before heard of by the oldest inhabitant now living. Mutton was fully 7d. per lb.; lambs varied from £11 to £29 per score. One lot of lambs we heard fetched 10s. over £29 per score. The demand was so great, that everything in the shape of sheep or lambs was bought up. Upwards of three thousand were sold in the fair on Monday, whilst in the course of the previous week about one thousand more were purchased in this neighbourhood, and driven away. The cattle fair also produced a larger number of cattle than was expected, evidently showing there was no want of cattle in the neighbourhood, and which sold very freely at a little lower rate than at late fairs. Upwards of four hundred head of cattle changed owners during the day.

GLASGOW FAIR.—The supply of all descriptions was fully equal to the demand, but we have seldom seen a more limited show of good draught horses of the Clydesdale breed. The highest prices received for this class were from £50 to £55. Harness horses brought from £18 to £27, of which class a good many found purchasers. For carriage and saddle horses the prices ranged from £40 to £50, and the demand was fair.

GLOUCESTER MONTHLY MARKET.—The attendance of buyers was large, and all kinds of stock advanced in price. Of beef the supply was very limited, and all was soon disposed of. The mutton trade was brisk, and met with ready purchasers. An average number of lambs were penned, for which high prices were asked, but all were readily sold. Beef ruled from 6½d. to 6¾d.; mutton, from 6½d. to 7d.; lamb, from 7½d. to 8d. per lb.

GLOUCESTER CHEESE MARKET was well supplied, about 80 tons being pitched, which were sold early, at the following advanced prices:—Best singles, 56s. to 58s.; seconds, 50s. to 53s.; skim, 35s. to 38s. per cwt. The attendance of dealers was good.

HELSTON FAIR was but scantily supplied with cattle, which may be accounted for by the continued rain which fell throughout the day. Fat cattle sold heavily at 60s., and lean at 40s. per cwt.

HORSHAM FAIR.—We had a larger supply of Devon beasts, and the quality better than we have seen for many years at this fair, and the prices demanded were extravagantly high. There was also a good supply of sheep, calves, and pigs, all of which brought a very high figure. Several pens of sheep were sold at a profit two or three times during the day, whilst a few overstood their market. Lambs were from 6s. to 8s. a head dearer than last year. The highest figure we heard of was 32s. Notwithstanding the abundant supply and exorbitant prices, there was a great deal of business transacted.

INVERNESS NEAT SHEEP AND WOOL FAIR.—Our annual market commenced, as usual, on Thursday last—the second Thursday of July. Its importance to the whole northern counties is well known, for it includes the disposal of our staple products—sheep and wool; and sales of the value of about £200,000 are transacted. A slight rise or fall in prices, extending over large flocks, and whole districts of the country, is therefore regarded with lively interest; and we are happy to say that for several years there has been a steady advance in the value of both sheep and wool, consequent upon the continued prosperity of the country. Last year we recorded a considerable rise, and this season the advance has been from 20 to 30 per cent., including all descriptions of sheep—lambs, ewes, wedders—particularly lambs, on which the advance is greatest. All were in great demand. Fat stock sold high last year; the buyers made well by their Inverness purchases, and, though the turnip crop is rather under than over an average, it has revived with late rains, and the demand for mutton can scarcely be met by the supply. Our friends from the south, therefore, came prepared to give good prices, and the farmers have not been disappointed. In wool the sales have been limited, in consequence of the prices asked. From 20 to 30 per cent. on last year's prices, and even more, was offered, and in many instances refused—the sellers of the great lots being disposed to consign their wool to the commission agents at Liverpool. The wool purchasers from England state that business is considerably unsettled by the Turkish question and the rumours of war. The consumption of wool has for some time exceeded the supply, although there has been no falling off in the imports of foreign wool. In fact, the general prosperity of the country, and the increasing amount of our exports,

affect equally the value of the fleece and the carcase, and tend to benefit the sheep farmers in no ordinary degree. Their gain, however, is an index to the flourishing state of the kingdom, and no one class can advance in trade without extending the benefit to other interests, all of which are mutually dependent on each other. In this fair the business in wool was stiff, as very high prices were asked; and the sums obtained for the stock rendered the farmer by no means disposed to part with his clip without a sufficient consideration. He could better afford to "wait on"; while the woolstapler was afraid, from the rumours of approaching war, to speculate largely. The following sales, however, were effected:—Mr. Mackay, Thurso, sold his half-bred ewe and hog wool at 33s. per stone. Mr. Reed sold his Cheviot wool, smeared, at 22s. Mr. Cunliffe bought Mr. Ross, Kinnahaird's, white Cheviot wool at 27s. Culigran washed wool, 20s. Mr. Geo. Clarke, Stronchrubie, sold his wool at 22s. Mr. Gunn, Dornoch, 20s. Mr. Mitchell, Rabigill, 22s. The Mudale wool, 22s. The Sandwool wool, 21s. Mr. Clark, Eribol, 21s. 6d. The Rispond wool, 21s. 6d. The Keoldaie wool, 21s. The Glenquoich Cheviot wool, 20s.; cross ditto, 18s. Mr. Barclay, Davochbeg, Cheviot wool, 22s. Mr. Robertson, Aigas, sold the Glencanmich laid washed wool at 22s. The Ardvar Cheviot wool, 21s. Mr. Sangster sold Coignafern wool to Mr. Dobson, at 23s., delivered free, with luckpenny. The Gnisachan Cheviot clip was sold at 20s. Dr. Fraser, Kerrow, sold his laid Cheviot wool at 19s. Mr. Blake, Corriemony, sold his laid Cheviot wool at 19s., and cross wool at 16s. 6d. Mr. Paton bought Mr. Scott, Tullich's, wool, at 20s. 3d. Dalnaclayton wool, 22s. Grant, Dirlot, 22s.—*Inverness Courier.*

NEWARK FORTNIGHTLY MARKET.—There was a good supply of sheep, which met a ready sale. Prices about the same. There were 573 sheep and 83 beasts penned.

NEWCASTLE EMLYN FAIR.—This was a large fair, with a moderate show of all kinds of cattle, which realized very high prices. Young horses in good condition went very high—upwards of £30 each—and ten-year olds sold as high as £20, and inferior £10. Horned cattle as high as any former prices.

OVERTON SHEEP FAIR was largely attended by farmers and dealers. The supply of sheep was somewhat small, and consequently trade was brisk; the whole of the animals penned being quickly disposed of at prices varying from 6s. to 8s. per head above the quotations of the last fair.

PERTH SHEEP AND WOOL MARKET.—The sheep and lambs were comparatively limited in point of numbers. There were numerous buyers upon the ground, but owing to the high prices asked few sales were effected. Lambs fetched from 18s. to 19s., blackfaced wedders, from 25s. to 28s.; Leicester breed, from 35s. to 39s.; cross breeds, from 27s. to 30s. In the wool market little business was done, as sellers asked such prices as buyers were unwilling to comply with. For laid wool, 14s. per stone of 24lbs. was asked, but buyers offered only 12s. 6d. and 13s., and of course no sales were effected. Unwashed Highland was from 15s. to 16s.; washed white, at from 18s. to 19s.; cross hogs, at from 26s. to 28s.; half-bred and Cheviot, at from 30s. to 33s.

SALISBURY SHEEP, CATTLE, AND WOOL FAIR.—The attendance of dealers was much better than was expected. Nearly 10,000 sheep were penned, many of which changed hands at an early hour at very high prices. The show of horses, cattle, and pigs was small. Mr. J. Futcher, jun., of Fovant, penned 100 very fine ewes, which were generally admired; 65s. was offered and refused, 70s. being the figure asked. The same gentleman also had 100 wether lambs, for which the prize was awarded; 42s. was asked, and 38s. refused. 160 fine ewes, belonging to M. T. Hodding, Esq., realized 40s. We also noticed a very fine pair of ram lambs, belonging to Mr. Taunton. The general prices obtained were as follows:—Lambs from 20s. to 32s.; ewes, 30s. to 40s.; wethers, from 30s. to 48s. In the cattle market business was done at an ordinary figure. At the wool fair, which was held in the market-place, but little business was done, the price asked finding purchasers but in very few instances. There was very little pitched. The following prizes were given:—A piece of plate, of the value of £5, by Mr. Alderman Smith, for the best 100 wether lambs, penned for sale, Mr. J. Futcher, jun., of Fovant. A piece of plate, of the value of £5, by the Committee, for the best pen of 10 ram lambs, Mr. Spencer. A piece of plate, of the value of £5, by the Committee, to the person who shall pen the largest number of sheep stock for sale, Mr. S. Strange, of Haselbury Bryant, Dorset. A piece of plate, of the value of £5, by the Committee, to the person who shall purchase the largest number of sheep stock at the above fair, Mr. Charles Parr. Extra Prizes: A piece of plate, of the value of £5, for the best 100 ewes, to Mr. J. Futcher. A prize of the value of £3, for the best 100 wethers, Mr. Crewe, Wincanton. Mr. Strange penned 1,060 sheep, and Mr. Charles Parr purchased 826, which was 16 more than was bought by any other person. —*Salisbury Journal.*

REVIEW OF THE CORN TRADE

DURING THE MONTH OF JULY.

Considerable excitement has prevailed in the grain trade since we last addressed our readers, and a further rise has taken place in most kinds of corn. The entire advance in the value of wheat from the lowest point in May may be fairly estimated at 10s. per qr. That so great a rise could not have occurred under free trade, without the occurrence of events likely to cause a degree of scarcity, is self-evident. That which gave the first impetus to the upward movement was unquestionably the shortness of the breadth of land under wheat. The unremunerative rates at which that article has been selling since the removal of the duty has, no doubt, induced many farmers to devote a smaller breadth of land to the cultivation of wheat than was formerly the case; and we are inclined to think that the culture, therefore, has been gradually diminished for several years past in the United Kingdom. In Ireland such has certainly been the case.

The very wet weather experienced in the autumn of last year rendered it nearly impossible to get the seed in, on the land intended for wheat; and though great exertions were used to make this good by spring-sowing, still the best authorities agree in stating that the number of acres under wheat does not exceed *three-fourths* of what would have been seeded had the seasons been more propitious. We started, therefore, under serious disadvantages, and the weather since has not been of a character to lessen the apprehensions thereby occasioned.

The early part of the summer was wet and cold, and until the beginning of June vegetation was very backward; increased warmth and genial showers in that month worked some improvement, but wheat did not come into ear until about a week after the usual period. The month now about to terminate has, on the whole, been unfavourable, too much rain and an absence of sunshine having been

the leading characteristics. We have, besides, had several violent storms of wind and rain, which have beaten down and twisted the corn crops so as to cause much injury. It is therefore more than probable that, with a deficiency of one-fourth in the breadth, the acreable yield will also be small, even if the weather from this time to harvest should prove propitious. That uneasiness in regard to the future should consequently be felt is perfectly natural; and the position of affairs at home would almost suffice to account for the advance which has taken place.

Other circumstances have, however, transpired, of a nature greatly to add to this feeling. Great Britain having of late years become dependent on foreign nations for a large proportion of the food consumed by her inhabitants, the occurrence of anything threatening to interfere with the regular supplies from abroad has become a subject of serious importance. When, therefore, the Russian and Turkish dispute began, the possibility of war —which would at once have cut off our supplies from the Black Sea—led to enhanced terms; and though matters now wear a somewhat more pacific complexion, still the uncertainty which has existed on this subjects for the last two months has had the effect of lesssening the regular summer shipments; and it is certain that the receipts of breadstuffs from eastern ports will, during the autumn, be much smaller than they would have been if no difficulties had arisen between the Czar and the Sultan. That this must influence prices hereafter cannot be questioned. The second point in importance, in reference to the future supplies from abroad, is the present position of France. That country has for some years past furnished Great Britain with one to two millions of sacks of flour per annum: this importation is likely to cease entirely. At present flour is actually from ten to twenty per cent. dearer in France than in England, and the accounts from thence state that the prospects for the ensuing harvest are of such an unfavourable nature, that the probability is that large imports will be needed. The Government, foreseeing the consequences of scarcity and high prices, have already taken steps to facilitate imports: the differential duties on corn have been suspended, and this step is looked upon as precursor to the opening of the ports for the free admission of grain. Whether such will actually be the case we are not in a position to determine; but it is tolerably certain that if our wheat crop should prove as deficient as is feared, and Great Britain should require larger supplies that usual, she cannot expect to derive assistance from France. But the matter does not end here; the wants of our neighbours threaten to be as pressing as our own, and these must be satisfied. Already France has bought largely of wheat in the English markets; she has outbid us in the Baltic; and supplies from the Mediterranean and Black Sea, which would in the ordinary course of things have come to British ports, have been ordered to Marseilles. It appears therefore that with increased wants we shall have diminished imports; hence a higher range of prices than we have yet had since the commencement of free-trade may be reckoned on with certainty during the next twelve months, and those who looked upon the repeal of the corn-laws as a remedy for scarcity under all circumstances, are likely to discover their mistake. Under this crisis, it is of the utmost importance to obtain accurate information relative to the real state of the crops, and we shall feel greatly obliged to such of our agricultural friends as will furnish us with reports in sufficient time to enable us to embody the same in our next monthly article. The accounts that have hitherto reached us agree amazingly on one point, viz., as to the smallness of the breadth of land under wheat. In other respects there is, as usual, a good deal of difference. The damage done by the violence of the wind and the heavy rain on the 14th and 15th inst. has been much greater in some localities than in others. There are complaints of the discoloration of the straw and appearances of red gum from particular districts, whilst in others no mention is made of these. We hear of ill-set ears, owing to the disturbing influences of the weather during the blooming time; and, on the whole, the reports of an unfavourable nature greatly preponderate over those of an opposite character. Lent-sown corn being less liable to injury from wet than wheat, has not suffered to the same extent, and with good harvesting weather oats and barley would, we are inclined to think, give a very fair yield, and be of satisfactory quality.

Beans and peas have been much benefited by the frequent showers, and in many parts of the country the produce of both will be large.

All kinds of green crops will also give a large return, and hay, in all the southern counties, is heavy in bulk. Unfortunately, however, a great portion has been much injured by the rain, and a not-inconsiderable quantity entirely lost, having been swept away by the floods.

With a threatened deficiency in the produce of wheat, and the prospects of a decrease in the foreign supplies of breadstuffs, the state of the potato crop becomes a subject of the utmost importance, and we have endeavoured to collect all the information possible, to enable us to come to something like a conclusion as to the probable yield of that article. That the disease to which the root has been liable the last few years has again manifested itself does

not admit of doubt; but whether it will prove so virulent as in former seasons is not so easily determined. In the counties of Essex and Kent the disorder has appeared earlier than usual; and we can speak to its disastrous consequences from extensive personal observation, as well as on the authority of several large growers. The accounts from other parts of the kingdom are, however, not so alarming; and in Ireland the potato crop, thus far, seems to have almost escaped the malady.

That the exhausted state of the stocks of old wheat in all parts of Europe is to be attributed in a great measure to the consequences of the potato disease since 1847 hardly admits of doubt. The deficiency of food caused by this mysterious disorder has been enormous, and other articles have been consumed so freely as to empty the granaries of all previous accumulations. Another failure of this useful root in the northern countries of Europe would therefore prove a great calamity.

The tenor of the foregoing remarks, and the facts there adduced, will, we think, have prepared our readers for the opinion we are now about to give, viz., that the rise which has taken place in the value of corn has been warranted by circumstances. Such being our belief, we do not calculate on any material reaction; and we should certainly not be surprised to see prices higher during the winter than they are at present: at the same time it is not improbable that a calm may succeed to the excitement which has lately prevailed. The prices now current must give foreign growers who send their produce to Great Britain a large profit, and those countries that can spare any portion of their stocks are sure to ship to England. The possibility of still higher prices has also stimulated our merchants to send out orders for wheat to different quarters, and this may have the effect of causing supplies to come forward on a scale of some magnitude. Should these arrive altogether, a temporary depression might occur; but that we shall in the long run need all we are likely to obtain, we feel fully satisfied. The arrivals from the Baltic have thus far been comparatively small, and America has sent us less flour than might have been expected; but from ports east of Gibraltar the supplies have been immense. These would no doubt have been followed up, if shippers on the Black Sea, &c., had not been deterred from making further consignments by the political state of affairs in the east, scarcity of vessels, and high freights; as it is, however, we must calculate on a break in the regularity of the supplies from that quarter. Many of the cargoes which have arrived off our coast during the month, from ports east of Gibraltar, have been bought, floating, for French account, which has lessened the pressure that might otherwise have been occasioned by the magnitude of the supply. We shall now proceed to give an account of what has occurred at Mark-lane since our last.

The arrivals of English wheat into the port of London have been very small: this has probably been caused by the fact that farmers have been much occupied in securing their hay crops. The shortness of the English supply for many consecutive weeks has occasioned a great want of the finer kinds, and there has been considerable competition week after week among the millers to secure the best runs. The upward movement in prices has therefore continued with scarcely a check. On the first Monday in the month the Essex and Kent stands were cleared without difficulty at prices 4s. to 5s. per qr. above those current on that day week; and the few lots which were offered from Lincolnshire and that neighbourhood were placed at a similar improvement. This important advance having been established, buyers became somewhat less eager to purchase, and quotations did not undergo any further alteration until about the middle of the month. The neighbourhood of London was visited by a severe thunderstorm on the night of the 14th, and the next day (St. Swithin's) was thoroughly wet: this gave increased confidence to sellers, and on the 18th inst. wheat again rose 2s. to 3s. per qr. Since then the deliveries from the home counties have increased. On Monday last there was a better show of samples on the Essex and Kent stands than on any previous occasion this month, and the morning being fine the trade was somewhat languid; factors were nevertheless enabled to dispose of nearly the whole of the supply at prices 1s. per qr. above those current on that day week; and thus far the tendency has continued upwards.

The arrivals of foreign wheat have been rather large: a much greater proportion than usual has been from the Mediterranean and Black Sea—the supplies from the Baltic having been comparatively small. The latter kinds have been much more sought after than the former; but the rise in value has been nearly the same on all descriptions. A large business was done on the 4th inst. at an advance of fully 4s. per qr., and on that day fortnight a further enhancement of 2s. per qr. took place. The country demand has since somewhat abated; and the town-millers having apparently secured sufficient for their immediate wants, we have had eight or ten days of comparative calm, but there has not been the slightest disposition to give way. Good Polish Odessa may be quoted at present 46s. to 48s.; Marianople, 50s. to 52s.; the commoner kinds of Lower Baltic wheat, 55s. to 57s.; superior, 58s. to 60s.; and Danzig from 56s. up to 64s. or 65s. per qr. Stocks in granary have not accumulated—the quantity taken off the market

by purchasers from different parts of the country during the month having been quite as great as that imported; whilst the consumption of the metropolis has, owing to the smallness of the home supplies, been thrown principally on the finer kinds of foreign wheat. The transactions in floating cargoes have been very extensive. Considerable purchases have been made from time to time on French account; in addition to which, a good deal of wheat on passage has been taken by our own millers and speculators. The arrivals off the coast from ports east of Gibraltar have—as already intimated—been on a liberal scale, but not the slightest pressure has been caused by the magnitude of the supply; indeed, the advance has been quite as great on floating cargoes as that established on parcels on the spot. Large purchases have also been made free on board at Baltic ports, partly on British and partly on French account, mostly by London agents. The terms now asked are 49s. to 50s. for good Lower Baltic, and 50s. to 53s. per qr. for white wheat from Stettin, Konigsberg, and Danzig. These rates, with the high freights—say, 4s. to 5s. per qr.—sound dues, and insurance, will bring the cost at the ports of discharge to about what similar qualities might be bought at in the London market, leaving little margin for the risk of condition, short measure, &c., &c.

The important rise in the value of wheat has obliged the millers to advance the price of flour; and the top quotation for town-made was put up 3s. on the 4th, and again 3s. on the 18th inst.; this brings the present price per sack to 50s. Town-made and the best country household flour may be quoted 42s. to 44s., and Norfolk 38s. to 40s. per sack. From abroad the arrivals have been small, and have consisted principally of American. Stocks of French flour are nearly exhausted, and the quantity of American in warehouse has been greatly diminished. The advance on the latter since the end of last month has been about 3s. per brl.—good brands being at present worth 27s. to 28s., and fine 1s. more. A large portion of what remains in store is held on French account, and will probably be shipped for that country so soon as the duty comes off there; this will be on the 5th August, at the ports on the coast from Havre to Dunkirk, and during the subsequent week in other sections of the kingdom.

Very little barley of home-growth has appeared in the London market; indeed, so trifling have been the supplies, that it is impossible to state the exact value of the article. The few lots which have come forward have been easily placed at extreme rates. From Denmark and the Lower Baltic ports the receipts have likewise been scanty—by far the greater part of the foreign supply having been from ports east of Gibraltar. Good Baltic barley has sold readily for grinding at 28s. to 30s., and fine heavy qualities have been held even higher. Southern barley may be quoted from 23s. to 24s. 6d. per qr., according to quality. There is a fair quantity of Egyptian, Syrian, and similar sorts on the market, and a few parcels of inferior French; but of really good qualities the market is extremely bare.

Malt has been in request, partly for exportation to Australia. This extra demand has caused prices to creep up 3s. to 4s. per qr., and fine samples have lately realized as much as 65s. to 66s. per qr.

During the early part of the month we received very small supplies of oats; and the dealers' stocks having previously been reduced into a narrow compass, the upward movement in prices which had already commenced when we last addressed our readers received a fresh impetus. This grain met a ready sale on the first Monday in the month, at an advance of 6d. to 1s. per qr.; and a further rise, to the same extent, was established on that day week. Since then, supplies from Ireland have increased, and several cargoes have reached us from foreign ports—among the latter, a few from Archangel, being the first Russian arrivals of the season. On the 18th prices remained precisely as before, but on the 25th a reaction to the extent of about 6d. per qr. took place. The quality of the new Archangel oats is not equal to last year's shipments from the same port; the weight is lighter by at least 2lbs. per bushel, and the samples are less even, having more than the usual proportion of green, unripe corns. The price asked for the first arrivals has been 23s. to 23s. 6d. per qr., which we consider high, compared with other sorts, good Irish of 40lbs. weight being obtainable at about the same figure, and Danish and Swedish oats at 22s. per qr. Of English and Scotch oats, the quantity on the market is so small that factors are enabled to obtain relatively higher rates for the same than can be realized for either Irish or foreign.

The supplies of beans, though not by any means liberal, have about sufficed for the demand. There was some advance in the early part of the month, but during the last week or two prices have remained perfectly stationary.

The few small lots of English peas which have come forward from time to time have met buyers at full terms. Boilers may be quoted 43s. to 45s., and maple and grey 40s. to 42s. per qr.

Indian corn did not excite much attention in the early part of the month; but the reports of the appearance of the potato disease in various parts of England have within the last eight days increased so fast as to cause holders of floating cargoes to

raise their pretensions, and purchases could not at present be made without paying an advance of 1s. to 2s. per qr. on the rates current when we last addressed our readers.

Though we have already made allusion to the position of affairs at some of the foreign ports, it may not be amiss to enter a little more fully into the subject, before we close our remarks.

The summer appears to have been of a similar character, over a large portion of continental Europe, to that experienced in Great Britain. More wet and less sunshine than is usual in July have acted unfavourably on wheat; and the prevailing impression is that it will prove a bad wheat year generally. England and France are, however, the countries which have fared worst; and we do not think that the deficiency will prove serious in the northern parts of Europe, if fine weather for harvesting should take place. Foreign merchants have not been slow in ascertaining the probable wants of Great Britain; and prices have run up even faster in the Baltic than with us.

The latest accounts from Danzig inform us that good supplies of wheat had been received there from Upper and Lower Poland, and that further arrivals were calculated on from that quarter. The total quantity which had passed the frontiers since the spring had amounted to 180,000 qrs., and it was expected that about 50,000 qrs. more would come forward. The stocks in warehouse were tolerably good, though the shipments had been on rather a large scale, and would have been more extensive but for the scarcity of vessels.

It may, however, be observed that Danzig is nearly the only place in the Baltic, where any stocks of importance are held, and that if our requirements should prove as great as it is feared they will, we cannot calculate on assistance to the same extent as in ordinary years from that quarter. In addition to the British demand, an active enquiry had been experienced at Danzig for France, and 50s. to 52s. per qr., free on board, had been readily obtained for good to fine Upper and Lower Polish of 62 lbs. weight. Vessels had been sought after, for London and Havre, and freight to the former port had risen to 5s. per qr.

From Konigsberg, we learn that the prospects for the crops in that neighbourhood were considered to be far from promising, which, together with an active export demand, had caused prices of wheat to advance materially. Vessels were scarce, and freight to London 4s. 9d. per qr.

Letters from Stettin, of the 23rd inst., state that considerable excitement had prevailed there during the week, and that high prices had been paid for wheat, say 50s. for red, 51s. for white Polish, of 61½ lbs., and 52s. 6d. to 53s. for fine, 62 lbs. quality. Freight to London had risen to 5s. 6d. per qr.

Rostock letters of the 23rd inform us that supplies of grain from the growers had nearly ceased to come forward, and that for fine parcels in granary equal to 51s. to 52s. per qr., free on board had been demanded. The reports from most of the other Lower Baltic ports are of a similar character.

The communication by telegraph with most of the near continental ports is now so regular that every change which takes place here is quickly known on the other side, and the fall or rise in the English markets is immediately responded to. The slight check which took place in the upward movement at Mark Lane last week, was consequently felt at Hamburg; prices were nevertheless well supported there, 51s. 3d. to 51s. 6d. having been asked for red wheat, weighing naturally 58 to 58½ lbs., made up 60 lbs. per bush.; and good Wahren of 60½ lbs. weight, had been sold at equal to 56s. per qr. free on board.

In Pomerania, Silesia, Mecklenburg, &c., there appear to be scarcely any stocks of barley or oats left; but from Denmark and Sweden moderate supplies may still be calculated on. Barley of 53 lbs., weight, from the Danish Islands, had been offered at Hamburg at 26s. 6d. to 27s., and oats of 40½ lbs., weight at 19s. 6d. per qr.

In the Dutch and Belgian markets prices rose rapidly in the early part of the month, but since then matters have become more quiet.

The accounts from France speak badly of the prospects for the harvest; and the free importation of grain and flour into the northern ports had been permitted. The potato plant is stated to have evinced unequivocal symptoms of disease in various parts of the kingdom.

From the Italian States the accounts as to the harvest are by no means of a favourable character, and wheat and Indian corn were advancing in value at most of the Mediterranean ports.

From the Black Sea we learn that business had been seriously interrupted by the scarcity of ships and the high freights asked.

Advices from Odessa inform us that equal to 32s. per qr. free on board had been paid for good qualities of wheat, but at this high price buyers had acted cautiously.

At Galatz as much as 18s. 6d. per qr. freight had been paid for a small first-class English vessel to load wheat to the United Kingdom. The shipments from thence had in the month of June amounted to 18,719 qrs. wheat, and 26,157 qrs. Indian corn, against 19,389 qrs. of the former, and 33,826 qrs. of the latter in May. Stocks of wheat had become light, but of Indian corn the quantity on hand was rather large.

From America we have advices of recent dates, from which it appears that the prospects there for the harvest were favourable. The excited accounts from Europe had consequently had less effect than might otherwise have been the case, and prices of flour had not advanced materially. Quotations had, however, begun to tend upwards at the principal ports in the United States, as well as in Canada; and there can be no doubt that the orders which have since been sent out will have had the effect of causing a further rise on the other side of the Atlantic ere this. America will most likely be in a position to export largely of bread-stuffs, but scarcely, we think, to an extent to compensate for the falling off which must be caused by the inability of France to furnish supplies.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter			
Wheat, Essex and Kent, white, new..	50 to 55	fine up to	60	
Ditto ditto red.....	48	50	52	„ 56
Norfolk, Lincoln, & Yorksh., red..	48	50	„	58
Barley, malting, new..	30	32	Chevalier..	32 38
Distilling ..	29	31	Grinding..	28 31
Malt, Essex, Norfolk, and Suffolk, new	58	59	extra	62
Ditto ditto	old 56	58	„	60
Kingston, Ware, and town made, new	63	64	„	67
Ditto ditto	old 61	63	..	65
Oats, English feed..	20	21	Potato..	23 27
Scotch feed ..	24	25	Potato..	26 28
Irish feed, white	20	22	fine	24
Ditto, black	19	20	fine	22
Rye.....	28	30	old	28 30
Beans, Mazagan.....	36	37	„	37 38
Ticks.....	37	39	„	39 41
Harrow.....	38	40	„	40 42
Pigeon	38	42	„	42 46
Peas, white boilers 40	43.. Maple 36	39.. Grey		33 38
Flour, town made, per sack of 280 lbs.	—	—	„	45 50
Households, Town 45s. Country	—	—	„	40 44
Norfolk and Suffolk, ex-ship	—	—	„	38 40

IMPERIAL AVERAGES.

For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
June 11, 1853..	43	11	29	10	18	10	34	9	38	1	34	9
June 18, 1853..	45	0	29	1	18	11	30	11	38	11	34	6
June 25, 1853..	46	11	29	3	20	1	32	8	39	5	34	9
July 2, 1853..	47	3	29	10	20	6	32	6	40	1	35	10
July 9, 1853..	47	8	29	2	20	6	35	11	40	8	35	0
July 16, 1853..	49	8	28	11	20	11	34	10	40	5	36	8
Aggregate average of last six weeks	46	9	29	4	19	11	33	7	39	7	35	3
Comparative avge. same time last year	41	0	27	6	19	11	31	0	32	11	32	0
Duties.....	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's *Gazette*.	Qrs.	Av. s.	d.	Averages from the corresponding *Gazette* in 1852.	Qrs.	Av. s.	d.
Wheat....	86,290 ..	49	8	Wheat....	59,653 ..	41	0
Barley....	2,285 ..	28	11	Barley....	1,946 ..	27	0
Oats	10,951 ..	20	11	Oats	7,528 ..	19	11
Rye.....	159 ..	34	10	Rye.....	68 ..	30	1
Beans....	2,849 ..	40	5	Beans....	2,677 ..	34	5
Peas	274 ..	36	8	Peas	323 ..	30	11

HOP MARKET.

BOROUGH, Monday, July 25.

The few fine hops offering meet with a slow sale at barely late rates. The duty has advanced to £140,000, with a prospect of further improvement.

Sussex pockets ..... 115*s.* „ 130*s.*
Weald of Kents..... 120*s.* „ 140*s.*
Mid and East Kents..... 130*s.* *to* 180*s.*

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

Since Monday last scarcely any foreign potatoes have come to hand; but the supplies of English on offer have been extensive, and in excellent condition. The demand is steady, and a large business is doing, at from 5*s.* to 15*s.* per cwt.

PRICES OF BUTTER, CHEESE, HAMS, &c.

	s.	*s.*		*s.*	*s.*
Butter, per cwt.			*Cheese, per cwt. Cheshire*	68 *to*	86
Friesland	96 *to*	98	*Cheddar*	64	80
Kiel.....	90	94	*Double Gloucester*	63	70
Dorset.....*new*	96	10	*Single do.* ..	60	70
Carlow..... „	86	92	*Hams, York, new*	80	90
Waterford .. „	84	88	*Westmoreland*.. ..	76	86
Cork..... „	86	90	*Irish*	68	78
Limerick .... „	82	86	*Bacon, Wiltshire, green*	72	74
Sligo..... „	84	88	*Waterford*	70	..
Fresh, per doz. 11*s.* 0*d.*	13*s.* 0*d.*				

CHICORY.

LONDON, Saturday, July 23.

The supply of chicory on offer being on the increase, the demand for all kinds is heavy, and prices have again receded to some extent. The imports this week have amounted to 179 bags from Harlingen, and 50 cases of powder from Rotterdam.

Per ton.

	£	*s.*	£	*s.*		£	*s.*	£	*s.*
Foreign root (d.p.)	£	*s.*	£	*s.*	*Roasted & ground*				
Harlingen 27	0	28	0		*English*.....28	0	30	10	
English root (free)					*Foreign*.....42	0	43	0	
Guernsey 10	10	12	0		*Guernsey* 35	0	38	0	
York.....11	0	12	10						

Duty on all Coffee and roasted Chicory imported, 3d. per lb.; on Chicory Root £21 per ton.

WOOL MARKETS.

BRITISH WOOL TRADE.

LONDON, July 25.—Notwithstanding that the quantity of English wool on offer is not to say extensive, very few transactions have taken place in it since our last report. In prices, however, no change has taken place. The large quantities of colonial wool now submitted to public competition, and the fall in the quotations, have induced great caution on the part of dealers.

Current Prices.

	s.	*d.*		*s.*	*d.*
South Down Hoggets	1	4	*to*	1	6
Half-bred ditto	1	3½	—	1	6
Ewes, clothing.....	1	2	—	1	3
Kent fleeces.....	1	1½	—	1	3
Combing skins.....	1	1	—	1	4½
Flannel wool	1	0	—	1	4½
Blanket wool	0	8	—	1	0
Leicester fleeces	1	2½	—	1	4

LIVERPOOL WOOL MARKET, July 23.

Scotch Wool.—The unsettled position of the Turkish question, together with the unfavourable weather, have interfered with business, inducing people to buy cautiously; and as long as this continues it will tend to check prices.

		s.	*d.*		*s*	*d.*
Laid Highland Wool, per 24 lbs.....		13	6 *to*	14	6
White Highland do.....		17	0	18	0
Laid Crossed	*do..unwashed*	16	6	18	0
Do.	*do..washed*	19	0	21	0
Laid Cheviot	*do..unwashed*	20	0	22	6
Do.	*do..washed*	23	6	27	0
White Cheviot	*do .. ...do*.....	30	0	36	0

FOREIGN WOOL MARKET.

LEEDS FOREIGN WOOL TRADE, July 22.—Our market is becoming pretty well supplied with wools of all descriptions, and as the manufacturers, almost without exception, are run out of stock, we may soon expect a considerable increase of business. Prices are pretty firmly supported on the basis of last May sales; perhaps the higher qualities and better conditioned wools are even realizing an advance in some instances.

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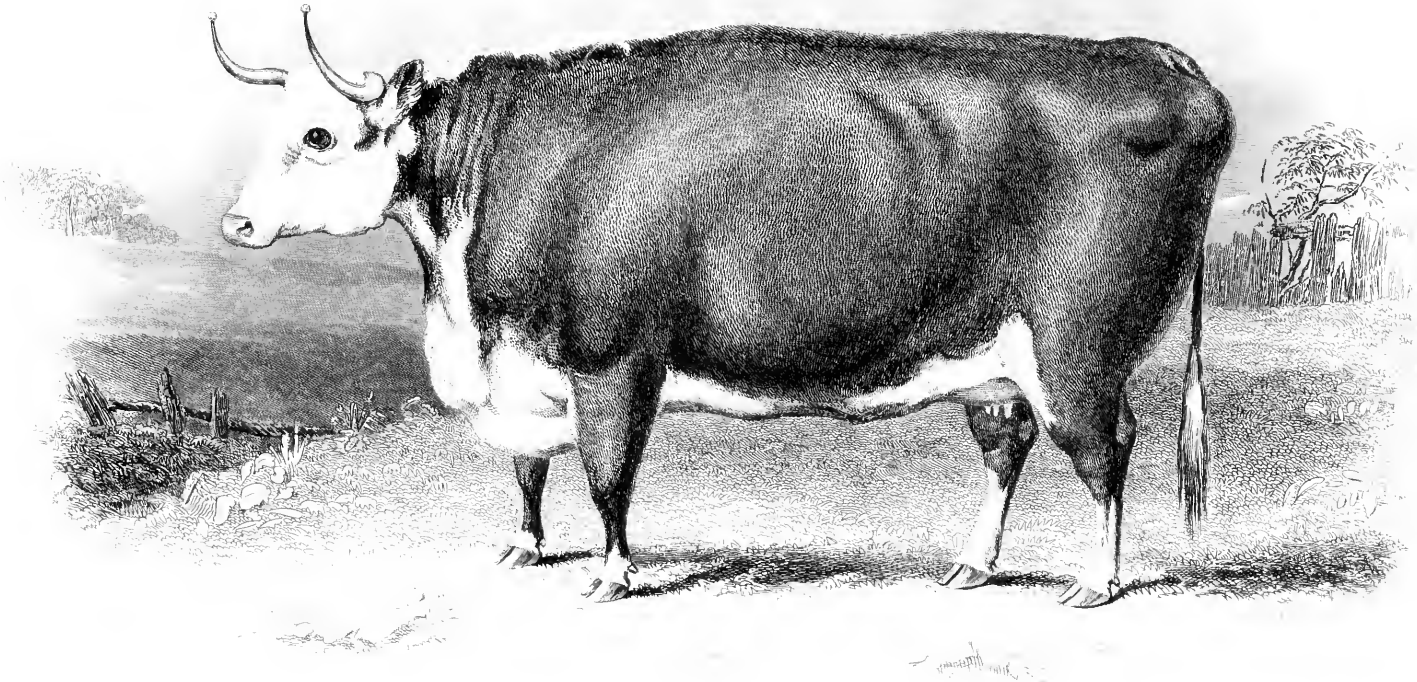

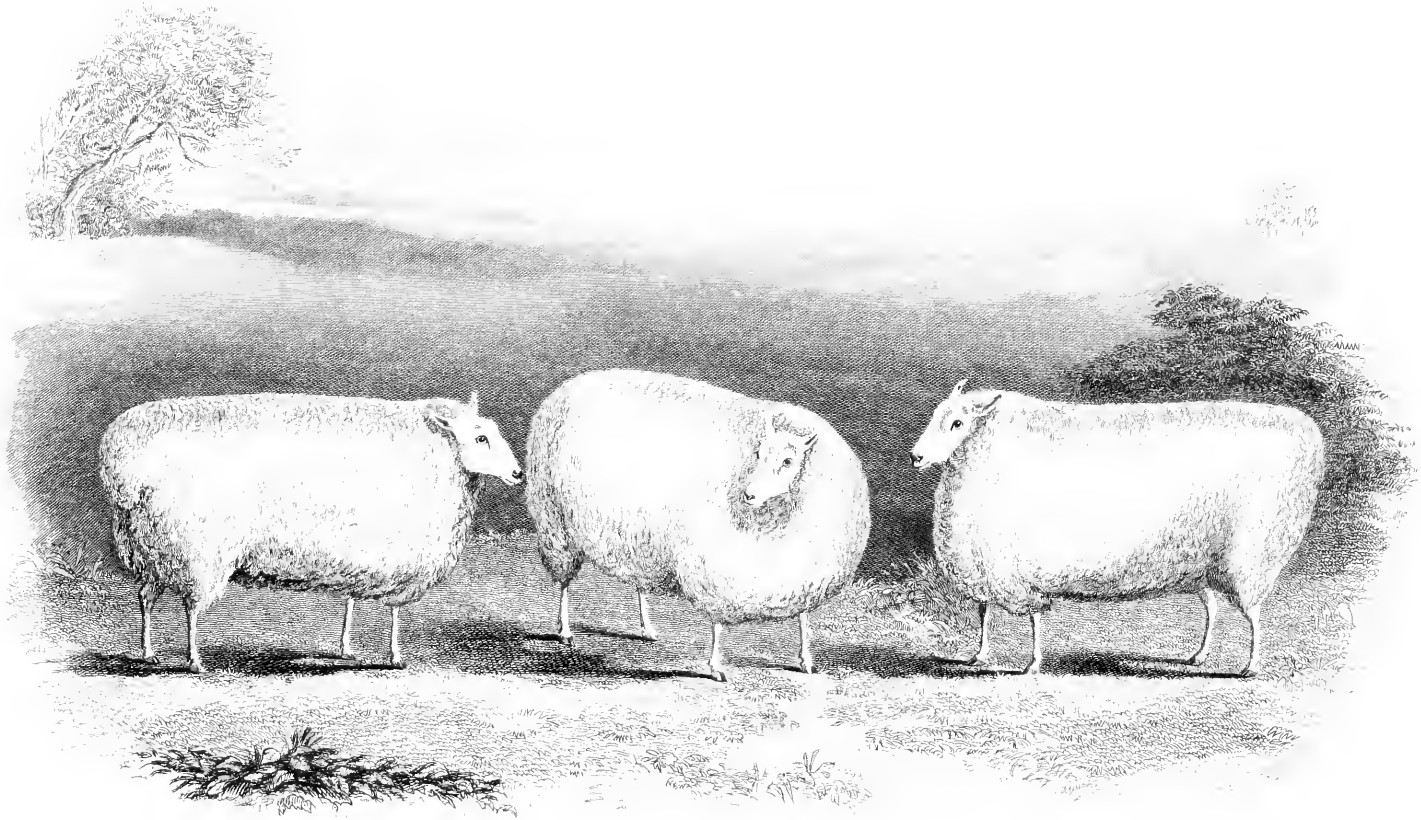

THE FARMER'S MAGAZINE.

SEPTEMBER, 1853.

PLATE I.

A HEREFORD COW,

THE PROPERTY OF MR. JOHN DUNNE COOKE, OF BRAMPTON BRIAN, LUDLOW,

For which the first prize of Twenty Sovereigns and Silver and Gold Medals were awarded at the Smithfield Club Cattle Show, December, 1852.

PLATE II.

LEICESTER WETHERS,

BRED BY AND THE PROPERTY OF THE MARQUIS OF EXETER, BURGHLEY, NEAR STAMFORD,

For which the first prize of Twenty Sovereigns and Silver Medal were awarded at the Smithfield Club Cattle Show, December, 1852.

THE VARYING NUTRITIVE PROPERTIES OF THE SAME CROP.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

It is only but of very late years that any considerable attention has been paid to the nutritive powers of different crops; still more recently has it been suspected, and shown by chemical analysis, that these powers vary in proportion to some of the circumstances which attend the growth of vegetables—such as the size of the plants, the first or second cuttings of the same crop, or the manures with which it has been fertilized. Certain observations of the practical farmer had, it is true, led him to suspect that such difference did occur, although he felt unable to assign any rational explanation of his little more than suspicions. Of such a kind were the conclusions of the Lincolnshire farmer, that the turnips fertilized with bones were rather more nutritive than those grown with farmyard manure; those of the east of England farmers, that the varieties of swedes which were remarkable for the bulk of their bulbs, were not so noticeable for their feeding properties; then again, the owners of the water-meads, in the valley of the Kennet, noticed that it was a safe practice to feed his sheep upon or soil them with the grass of the *first* crop of those fine meadows; but that it was very dangerous to do *either* with the *second* crop of water-mead grass. Now the origin of these phenomena stands so completely at the very threshold of all inquiries upon the growth of artificial food, that we cannot estimate too highly the value of any chemical researches which tend to elucidate them. There have been several papers published within these last few weeks, affording very considerable information on this important question. Thus Professor Way has shown (*Jour. Roy. Agr. Soc.*, vol. xiii., p. 176), that there is a very material difference between the chemical composition of the first and second crop of grass obtained from the same water-meadow; his specimens

were gathered I. on the 30th of April, II. on the 20th of June; now these contained in 100 parts in a green state—

	I.	II.
Water	87.58	74.53
Albuminous or flesh-forming principles	3.22	2.78
Fatty matters	0.81	0.52
Heat-producing principles—starch, gum, sugar, &c.	3.98	11.17
Woody fibre	3.13	8.76
Ash	1.28	2.24

The flesh-forming powers of different natural and artificial grasses were found by the same chemist to vary very considerably; thus 100 parts of the following grasses contained I. of water, II. flesh-forming principles.

	I.	II.
Sweet-scented vernal grass	80.35	2.05
Cock's-foot grass	70	4.06
Meadow barley	58.85	4.59
Meadow cat's-tail grass	57.21	4.86
ARTIFICIAL GRASSES.		
Trifolium incarnatum	82.14	2.96
Red or broad clover	81.06	4.27
Sainfoin	76.64	4.32
Cow-grass	74.10	6.30

Dr. Anderson (*Trans. High. Soc.*, 1853, p. 509) has given the amount of albuminous or flesh-forming matters in a variety of substances upon which the stock of the farmer is commonly fed; he found in 100 parts of—

Rape-cake—albuminous matters	29.53
Common Scotch tares	28.57
Linseed-cake	27.69
Field beans	27.05
Linseed	24.44
Grey peas	24.25
Clover hay (second crop)	13.52
Oats	10.16
Wheat	9.01
Scotch bean straw	8.25
Barley	7.74
Chevalier barley straw	1.90
Early angus oat straw	1.50
Red wheat straw	1.50
White wheat straw	1.37
Turnip	1.27

These researches are full of interest, and naturally lead to many practical conclusions in the selection of grass seeds, and in the feeding of stock with artificial food. The effect produced by the action of various fertilizers upon the nutritive properties of the plant has recently been examined by more than one chemist; thus during the attempts which are now making to introduce the manufacture of sugar from beet-root, many enquiries have been made, many trials instituted. It may be useful to the young farmer to know that it is now pretty well ascertained that from 7 to 8 per cent. of sugar may be extracted from the raw beet, by the most improved processes; and that in the south of France the manufacturers are now extensively using the yellow globe mangel wurzel for this purpose. We are assured that extensive preparations are now making to establish in this country a very large manufactory of beet-root sugar. An able and elaborate report on the composition and cultivation of the sugar beet in Ireland, by Sir Robert Kane, contains the result of several very laborious series of experiments, from which he concludes that—"the influence of manures upon the quantity of nitrogen is strikingly exhibited. Farmyard manure and guano appear, as a general rule, to increase the quantity of albuminous substances. This is especially remarkable in beet grown on loamy soils, but is not so apparent in those grown upon heavy clays, as Lord Talbot de Malahide's, Mr. Dargan's, and Mr. Hackett's, the effect of the manures being masked by the influence of the soil. The beet grown upon clay soils grows to a large size, and is more watery than that grown upon rich loams; the effect of this is to lower the per-centage of nitrogen and sugar in the raw beet, but the per-centage in the dried is to a great degree uninfluenced by these causes, and accordingly we find that in such cases also the effect of heavy manuring with farmyard manure and guano is to increase the per-centage of nitrogen. Sulphate of ammonia appears to have the same effect, judging from some grown in the Botanic Garden at Glasnevin; nitrates on the contrary, do not appear to affect the per-centage of the organic nitrogenous constituents, but are rapidly absorbed by the plant, and will be found in the juice along with the sugar. We have got nitrates in the juice of all the plants manured with nitrate of soda, before enumerated; and, in one case to the extent of 0.685 per cent. of nitrate of potash in the raw beet. Dumas mentions the case of a factory near Douai, where beet which had been grown upon some land covered with old plaster, and which, as is generally known, contains nitrate of lime, yielded more nitrate of potash than sugar. Large quantities of nitrates are often produced in beet, even when the land has not been manured with nitrates. In one of the large roots grown by Messer. Dickson, of Belturbet, we found 0.827 per cent. of nitrate of potash, and all the other roots grown on the same land were more or less impregnated with it.

"Beet manured with saline manures appears in every case to contain less nitrogen than when manured with guano or good, rich farmyard manure. Some of those grown by Professor Murphy afforded a good example of the influence of rich nitrogenous manures upon the per-centage of nitrogen.

"It would appear from one trial, that not only does the sugar diminish in beet about to flower, but that the nitrogen also slowly disappears during that period of growth.

"The composition of the specimens of beet grown by Mr. Demsdale upon 'red bog' are curious, as they show that beet grown under such circumstances, or, indeed, in all land abounding in organic matter of a peaty character, appear to expend its energies in the production of cells containing an exceedingly dilute juice. The parenchyma of the cells of beet consists of cellulose, which is coated, as it were, with lime salts of some of the forms of pectine; hence, there appears to be a certain relation between the amount of pectine and cellulose in the early stages of growth; but when the beet is about to flower, true woody encrusting matter alone increases. The proportion of pectine substances in the beet grown on the bog is unusually large; some turnips, and yellow globe mangel wurzel, grown on land reclaimed from cut away bog, is equally rich in pectine; but how far this is to be attributed to the nature of the soil, or to the abundance of lime derived from the underlying marl beds, it is difficult to say."

The *general* conclusions to which Sir R. Kane has arrived, with regard to the cultivation of the sugar beet, are as follows (*Report* p. 4):—

PROPERTIES OF GOOD ROOTS.

"1. They must have a symmetrical form, and as few forkings as possible, in order that they may be readily cleaned, and that as little loss as possible be sustained from too great a development of epidermal tissue. 2. They must not be too large, not exceeding four or five pounds at the utmost, as large roots are too spongy, and contain but very little sugar. 3. They must have a solid, hard flesh, with a large development of cylindroidal cellular tissue, must break short and with a cracking sound, and must rapidly sink in water. 4. The crown and heart must be as small as possible, in order that there may be as small a loss as possible from the removal of those parts which contain little sugar, but abound in salts, and because the smaller the cut surface of the beet is, the less liable it is to suffer decomposition from the action of the air. 5. The roots must have grown as little as possible out of the earth, and must not therefore exhibit a green segment about the crown, as all parts of the beet which grow out of the soil contain scarcely any sugar, having the composition of the crown and leaves. Care should therefore be taken in hoeing them, to keep the tops of the bulb covered with earth, close around the leaf-stalks. 6. The juice must be concentrated, and must have a sweet taste, free from any accompanying acrid or cooling saline taste. 7. They ought to yield a juice which, when heated, and precipitated with chloride of calcium, ought to yield scarcely any precipitate with lime water, and the precipitate with the chloride of calcium ought to be very small. 8. A fresh section of the beet ought not to exhibit a rapid blackening of the whole surface, which should be confined to the rings of vascular tissue. 9. The roots must exhibit as uniform a colour as possible, and, above all, must not show any streaks of pale rose red, as they then exhibit a remarkable tendency to throw out flower stalks, and to otherwise deteriorate. The only remedy for this defect, as well as for the tendency to produce bunches of fine roots like tassels, and to fork, where it does not arise from fresh dung or from stones in the soil, is a change of seed. 10. The roots should not be allowed to remain too long in the ground, or exhibit the slightest tendency to throw out their flower stalks, or to have the least symptoms of decay."

PROPERTIES OF SOIL SUITED FOR THE BEET.

"11. The soil should be a rich loam, inclining rather to clayey than to sandy, but should not partake in the slightest degree of a peaty character—that is, the organic matter should be fully decomposed and thoroughly well distributed through it. 12. It should be exceedingly well cultivated, and free from all clumps of hard clay, or from stones. 13. The subsoil should neither be a stiff, cold clay, or an open stony gravel. 14. The soil should be deep, and drained as thoroughly as possible. 15. Newly reclaimed land is unfitted for the cultivation of beet for the manufacture of sugar. 16. No labour should be spared upon the pulverizing of the soil, not only before the sowing of the seed, but during every period of the growth of the plant."

MANURES SUITED FOR THE BEET AND MODE OF APPLYING THEM.

"17. Rich nitrogenous manures, such as farmyard manure, guano, &c., should never be applied to land intended for the cultivation of beet, immediately before sowing, but should either be applied with the previous crop, or applied during the preceding autumn, or at least should be put on as a winter compost. 18. Soluble saline manures should be applied very sparingly, and never during the growth of the plant. 19. Salt should never be applied except with the greatest care, or any substance containing nitrates, or capable of forming them. 20. Ashes, such as those of wood, peat, coal, &c., may be employed, and bone-earth in any form, apparently without any injury. 21. Lime is always good, and calcareous soils seem to be the best adapted for the growth of all the varieties of the beet, and of most of the other root-crops. 22. Green manuring has always been attended with success,

and crops of rape, or of other plants having the general composition of the beet, may be grown upon land heavily manured in the autumn, with fresh farmyard manure, and then ploughed-in early in spring. 23. That the whole of the sugar in the Irish beet is crystallizable cane sugar. 24. That the per-centage of sugar in Irish-grown roots is not inferior to that of continental roots grown under the same circumstances."

The *general* conclusions to which all these researches tend are most important, since they lead us to this valuable inquiry, viz., Do we not sometimes lose in the feeding *quality* of our green crops what we gain in bulk?

DURATION AND NATURAL DECAY OF PLANTS.

BY J. TOWERS, M.R.A.S., H.S., ETC.

An interesting article upon this subject appeared in the *Mark Lane Express* of July 18th last. Its principal object was to prove that, throughout vegetable nature, every plant had a limited term of existence; and assuming the *potato* as (from existing circumstances) an important type, the writer proceeded to investigate the physiological structure, which, by its yearly developments of roots, branches, leaves, flowers, and fruit, proved that a relationship existed between plants of herbaceous character, and those of *perennial* growth, as well as with woody stems. Setting prejudice aside, the analogy is singularly striking; for, if it be admitted that the tuber of the potato is a *stem*—an *underground* stem—capable of extension by re-planting, or by division into sets, during an uncertain period of years; it follows that all the progressive developments above-named correspond closely with those of the woody tribe of plants. Experience has taught us, that many of those varieties which once were esteemed for their excellent qualities have long passed away, without leaving adequate representatives. Such were the ox-noble, the genuine early champion, and the russet-skinned early Shaw. We possess, it is true, numerous varieties called Shaws; but where shall we find the original type? I possessed it, in Berkshire, about the years 1831 to 1823; and most excellent, as to mealiness and flavour, it was. Now, our Shaws are not russet; they are waxy, and do not appear to me to vie with, or even resemble the true *Shaw*. The York Regent is, indeed, a good and mealy potato; but it is very susceptible of the epidemic blight, which now, during a course of nine consecutive years, has desolated one of the once staple crops of the land. Every direct and analogical fact seems to prove that the potato, as a *genus* or race—in common with every other vegetating plant, whether it be herb, shrub, or tree, can be *renewed* by *seed—only!*

Thomas Andrew Knight, of Downton Castle, late President of the London Horticultural Society, was unquestionably the ablest physiologist of his day. He believed that every fruit-tree had its limited period of existence: and consequently, that any attempt to extend, by grafting, inarching, budding, or by cutting, the life of any species or variety of a tree beyond its allotted term, must ever be vain and futile. I am aware that some able authorities were opposed to this opinion, which it now appears is gaining ground, particularly in quarters where experience and observation of facts are confided in as the safest of instructors. It is well known that the true, old *golden pippin* is all but, if not quite, lost. Several varieties, bearing that name, have been raised from seeds, and are found in our nurseries. These—as their fruit bears some resemblance to the genuine type—are permitted to retain its title, but with a distinctive prefix; and thus we have Knight's and Franklin's golden pippin. The Ribstone or Formosa pippin was originally raised from a seed, and there are now apples in abundance which retain the title; but like the old *nonsuch* and red-streak, exhibited at the *shows* in various localities, they differ so materially as to be with difficulty recognised.

With evidence of facts so determinate of the transitory nature of trees, we can scarcely doubt the correctness of Mr. Knight's theory; I therefore feel authorised to adduce an example which came under my own observation a few weeks since. It was an apple-tree on the lawn of a gentleman in Croydon, whom I believe to be one of the best amateur cultivators that I ever knew. The stem or bole of the tree was fully standard high, perfectly and regularly grown, and, at a guess, fully 13½ inches in the girth. The bark clean, free from moss, and, to all appearance, in sound health. What attracted immediate notice was the *head*, which, though sufficiently large and expansive, evinced every sign of debility; little or no spray, few leaves, and not a single fruit. Enquiring the name of the tree, and the cause of its deficiencies, I was answered "a ribstone pippin, and that it had arrived at the period of its final decay, having nearly attained the term of its existence!!" Struck with the remark, a long conversation ensued, which tended to confirm the opinion I had long entertained of the correctness of Mr. Knight's views. When

a tree was before one, the bole the healthy growth of perhaps 20 years, carrying the mere skeleton of a head that once had produced many hundred apples in one season, now just alive and without a single yearling shoot, or *one only*, and *that* at the base of a limb, near to its junction with the main stem, what other conclusion could be arrived at than that the head had become superannuated?

The reader who is desirous to solve a problem which was long involved in mystery, should consider—first, that the bole was in the full vigour of life and health; that it had continued annually to super-add layer upon layer of alburnum, all dependent upon its own convergent, medullary, horizontal processes—and secondly, that if it were deprived of its effete and useless head, by complete amputation, the new shoots and branches from a stock so powerful would be true to its own nature, unaffected by the specific, proper juices of the variety, that it had supported during the lapse of so many years!!

If one single apple exist on a tree, worn out by age as my golden pippin, or like the ribstone in question, and *that apple* be furnished with fertile seeds, plants, as a progeny, will assuredly be produced, and grow on to perfection; but *not one of them* will represent the parent. Therefore, as a general fact, it may be assumed that not any two of the progeny will be alike; and whatever be the number of the seedlings, they will differ, one and all as much from each other as from the parent tree, either in its head or stock. This is wonderful, but it will account for the existence of the hundreds of varieties and sub-varieties, which are now found in the fruit nurseries.—*Aug.* 6.

HARVEST OPERATIONS.

The "time of harvest" is one of the most anxious periods of the year to every practical farmer, and requires his best energies and judgment. In a precarious and variable season it is peculiarly trying, and he is often "at his wits' end:" his hopes and prospects are dashed before his face, do what he can to prevent it. We could almost forgive him his habitual grumble then. But often is he blessed with plentiful crops and beautiful weather, filling his heart with joy and gladness. Then it is that his soul should expand in gratitude and thankfulness to the Giver of all good. Is this the case? or does he practically take fine weather as a matter of course, and think no more about it. We cannot forgive him this! Resignation and gratitude are both equal and corresponding duties.

Harvest: Time of Ripening.—The first consideration with every farmer is, the ripening of his crops. Much difference of opinion prevails on this point. My opinion is, that all grain crops ought to be cut before they are fully ripe: they should never be allowed to stand till the grain is matured into hardness—that should take place in the *stouk* or *shock*. The straw should not die before it is cut; but it should lose its state of greenness, and attain the bright yellow, but not the "straw colour:" if cut in this bright yellow state, the grain will be found to possess a better quality, and yield more flour; but if allowed to attain the bright straw colour, the grain becomes hard and coarse, from the juices or succulence of the straw having, in some measure, gone into the grain, to form for it a more secure coating, in the shape of bran, against all vicissitudes of weather, and in aid of its future preservation. A bright yellow straw having become general, then every exertion should be made to cut the whole crop in that state: all hands should be brought to bear upon it: and so on from field to field. I strongly deprecate the old practice (good as it may be for the labourer) of retaining or hiring only a certain number of men to get in the harvest, and thus to leave it. The harvest cannot be secured too rapidly, providing all things are right and suitable. I have seen fields of corn standing in fine order for leading for some weeks, merely because the farmers' hands were engaged elsewhere, and it was not customary to engage further help.

Modes of Cutting: Reaping, Mowing, Bagging.—Reaping and mowing are synonymous terms, and merely mean to cut down; but they are not so understood amongst farmers. I therefore make the usual distinction. Reaping is done with either the sickle or the hook. In all light crops the sickle is to be prefered to the hook. The reaper with sickle gathers the straw into his hand before cutting, but the reaper with hook cuts much before he gathers it, and more is thus scattered. All light crops should either be "mown" or "bagged." I need not say that mowing is done with the scythe; and if the work is properly executed, the field ought to be cut close to the ground without leaving swathe baulks. Bagging is the cutting with a stroke or chop—a gathering with the hook and laying the corn in bands for the sheaf, and the cutting is done nearly as low as can be effected with the scythe, and by one individual. In mowing wheat it takes two men—the "scythe-man" and the "tyer." My practice is to mow up to the standing corn; the "tyer" gathers after the scythe, and makes the sheaves; these lie till evening, when they are put into stouks or shocks of ten or

twelve sheaves each; the sheaves varying from 2½ to 3 feet in circumference. The following morning the land is raked by hand with a swathe-rake, and in the course of the day the rakings are tied up and placed at the shocks. It is not good practice to cut corn in a damp or wet state; but I generally in the early mowing, and weather appearing favourable, "mow out" a small breadth till the dew is off, when tying commences as before; the damp lying to dry, and tied up as soon as ready. Barley and oats I more frequently mow out, and leave the swathes to wither and dry for a day or two, depending upon the weather. My heavier wheat crops are cut with sickle and hook: my lighter crops are all mown. I think, where it is practicable, every crop should be mown or cut close to the ground in some way or other. The great objections are the extra cartage and cost of stacking and securing so much straw: but against that is the extra manure obtained from this undiminished crop of straw, no stubbles to rot and disappear, besides the land being ready for any further operation; and the stubbles must be cleared at some time, which is too often done when whatever strawy nature remained in the stubble has been dissipated and gone.

Stouking or Shocking.—The sheaves should be set up firmly, and in such a position as most likely to withstand a rough wind, and to allow any rain to run down the outer-side of the sheaf. The heads or ears should be closely pressed together, and the ears of the bands turned inwards. Ten or twelve sheaves are sufficient for a shock.

Capping the Shocks is done by turning two sheaves bottom upwards, opening and spreading the ear ends, and placing them on the top of the shock, so as to form a kind of thatch to shoot off the wet. This is unnecessary, except in the worst of wet seasons, and then its usefulness is of a very doubtful character. It prevents the speedy drying of the shock.

Leading or Carting.—This should be done with all speed, as soon as the crop is "in order"—dry and sufficiently withered. I prefer leading with carts at short distances, but with waggons if above a mile. A man or stout youth should be attached to each carriage: the work is done more cheerfully and readily than by a single man to "team" or unload. This is often made a matter of piece-work—"pitching and teaming" at an agreed price per acre—one man putting the crop on the carriages, the other from the carriages on to the stack, having lads to load and drive. This is a good practice, with plenty of help.

Stacking.—This is a very important harvest operation, as upon it depends the proper security of the crops. It is immaterial as to the mode of stacking: that is a question of taste with the farmer. I prefer round stacks of fair size, holding about fifteen waggon loads. They are the easiest to stack, and if nicely thrown over as the stacker approaches the eave, none look so well, or are more secure: they stand separately, are soon dry, and, in case of fire, are in less danger. Oblong stacks are of somewhat difficult construction—the corners requiring great care to keep them right, and the ends are very insecure, generally blowing up in stormy weather. To obviate this difficulty, many are made with slanting ends, almost like a hip-roof, which is better. The stackers should have abundant help: no time should be lost at the stack. In commencing his stack he should place the bottom of the first row of sheaves on the steddle, beginning in the middle, as if about to make a very large stouk, and gradually drawing them more slanting as he approaches the outside, taking care that no ears are likely to touch the steddle. As he proceeds with his stack, he should take great care to keep it upright, or, if carried over on the sides, that all parts should be carried over alike. He should always take timely precaution, by using props or "steadiers" to keep his stack from deviating. On reaching the requisite height, and before laying the eave-course, he should well fill-in the middle of the stack, so that on laying the eave-course the ear ends should be considerably the highest. As this is laid, the middle should then be filled in for roofing, and in such a way that every sheaf in the outer-roof should be so laid (with ears highest) as to shoot off the wet into the eave-course, which, if properly laid as above named, will again shoot it off upon the ground. The top of the roof must be finished with sheaves turned upwards.

Thatching.—This is an important operation, and ought to be done as soon as possible after the stack is sufficiently settled to hold the thatch pegs securely, which will generally be in two or three days. A temporary covering is worth putting on till thatched. Small sheaves of straw, reed, or sedge are very useful for this purpose, and are soon put on, and pegged down temporarily—one peg holding a dozen or more. The straw for thatching should be thoroughly saturated with water a few hours before required for use. When wanted, it should be drawn out carefully in straight "haulms," placed in prepared bands, made by tying two strong pegs together at one end with sufficient length of band required to hold the number of "haulms" or "yelms" to be placed therein, with a loop to hold all safe at the other. They are thus kept straight while carried up the ladder to the thatcher. The thatcher carefully lays these on the roof (making it as even and level as he can beforehand), and in such regular and systematic courses as likely to remain and turn the most rain: these he should fasten down with *marline*, hanked on the end of long strong pegs, and driven in with a mallet to make all as safe as possible. I think three, or at

most four, rows of bands, if properly thatched, quite enough for any ordinary stack: from three to fifteen rows of bands are commonly used in many districts. The stacks should have all the long ends and projecting ears from the sides struck or cut off, and carried away for immediate thrashing; but they should never be close-trimmed or pared, except in loose corn-stacks. It is very important in a variable season to have the sheaves made small and tight. The best, and almost the only thing that can be done, in continuous rains, is to keep them standing, and have them frequently moved—set out in twos and threes to catch every breeze or chance ray of the sun.

P. F.

LANDLORD AND TENANT.

A landlord who has once consented to receive a man as his tenant, can now scarcely place him in too unfettered a position. When he has fully satisfied himself that the character and means of the applicant are such as promise to do justice to his property, the less perhaps he defines how this is to be accomplished, the better. The reign of the old, long-drawn lease, with its many curious covenants as to what is to be done and what is not to be done, is fast drawing to a close. Improved agriculture could never advance in such fetters. The spirit of enterprise, and the incentive to experiment, would become equally subdued under the continuance of a system, which simply goes to declare that a man shall do just what his forefathers did, and no more.

The duties of a landlord, then, if not decreased, come gradually to be simplified. Let it be his care to see that his tenant starts fair, that he has the confidence to do his best, and then let him leave him to do it. In the comparatively rapid progress of modern agriculture, the parts which owner and occupier should take in the good work are getting easily to be distinguished and classified. *Permanent* improvements range themselves under the direction of the one, *temporary* with the other; and the closer either adheres to his own peculiar province, the more likely are we to find the business proceeding to a successful and satisfactory result. The capital of each should be kept strictly to its own employment, and a tenant no more be called upon to build than a landlord to manure.

A variety of circumstances—the want of capital among the foremost of them—has long tended to delay the full admission, or at any rate the practice, of this principle. We are day by day, however, coming nearer to its consummation. It is astonishing, yet, to find how the two are sometimes confounded. A tenant, according to some authorities, ought to have capital sufficient to set up an estate he merely intends to rent and cultivate. A landowner, on the other hand, should merge, it seems, from the somewhat comparatively passive position he occupies, into the most minute business of the farm. Improvement of every kind should be recognized as his, and as his only. He takes the measure of his tenant, and then gives him just as much line as he thinks fit, and no more. In the leading daily journal of Wednesday, Aug. 17, an elaborate consideration of Mr. Napier's Irish Land Bill is taken on some such premises. We learn that "the interest of the proprietor being clearly to increase the value of his property, he will be generally ready to make any real improvement which he believes his tenant will be disposed to profit by, although he may with justice refuse to expend money on improvements for a tenant who, experience tells him, will utterly neglect them."

This of course at once does away with any discussion or provision as to the tenant's claims. He can have no claim to improvements, as it is clearly not his duty to make any. His business is merely mechanical. He reaps and sows, and takes the produce to his employer, as the artizan might the made-up, from the raw material supplied to him. Picture the landlords of this country—or of Ireland, to which the system is to be made more immediately applicable—thus arriving at the individual excellence of their tenantry. What a fine study of human nature, and how intimately acquainted with so puzzling a problem they ought to be! See — so much improvement doled out to this man, because he is held qualified to do so much with it; while as little is allowed to another, whose standard of ability has not been taken so highly. We confess that we never heard of any plan so likely to make a promising farmer a stand-still one, or to keep a bad one, a bad one still. It is the talent of silver returned as it was given.

If, however, agriculture is to progress—if the tenant, English or Irish, is to be encouraged to doing more than he has done—it can never be under such a system as this. If the claim to compensation for unexhausted improvement can be met with no stronger argument, it is as certain to advance as it has advanced. Can it be conceived that the agriculturist of this present era—a man of intelligence, enterprise, and means—would submit to go on, thus confined by the views or notions of

any other man? Or, if he did attempt to do so, is it likely that he would, or could, make those efforts he might be inclined to, with more license and freedom to feel his own way?

To say, that in following out an argument the point has been thus driven beyond all reasonable limit or probability, is scarcely saying too much. In no country either could such a practice, as is here assumed, be so thoroughly impracticable as in Ireland. The proprietors in the sister kingdom—and we write it with all respect—have never been remarkable for doing too much in the way of improvement. It is questionable, indeed, whether they have, as a body, ever done their own share, and given the tenant that fair start we must insist it is their duty to insure him. We are quite willing to believe that a change for the better is gradually taking place, and that men, with more ability to do what is expected of them, are turning their views to this subject. It is still, though, remarkable that a good English landlord, whose care and pride it is to have his estates here in the best condition, rarely evinces the same feeling for such as he may have in Ireland. The state of the country may not have, so far, warranted it; the very influence and prejudices of the people may have been against it, but so it is even to this moment. It is difficult enough to get an Irish landlord to do his own share of the work, and we shall certainly be surprised to find him all at once volunteering to do his tenant's also.

To this though he must come. If he has any sense of right and justice—if he has any ambition to see the land made the most of, it is he himself must do it. A tenant can have no claim to the full, or fair profit of anything his industry and capital has achieved. He interferes with the rights of property when he makes such a demand. It gives him "an interest" in the land. It incites him to perjury, and all kinds of under-hand treachery. Let, then, the proprietor save him from temptation, and himself from imposition. Let us arrive at the admission of this one grand principle, and all will be well:—The occupier has no improvements, he can make none—he should make none, or if he does, of course they cannot be recognised to him. The Gordian knot is at once cut through. It is done, too, with a simplicity of greatness that must carry its own weight with it. As promising as practical, we see its full development in no distant perspective, and the busy owner happily employed in meting out his tons of bones and guano, to those who have character and talent enough to warrant the supply.

"FARMER BROWN" AND THE IMPROVEMENT OF AGRICULTURE.

"Farmer Brown is a nice man," said old Hopgood, his thrasher, who had lived with him, man and boy, for more than forty years—"Farmer Brown is a nice man, and grows *uncommon* crops; see what a stack-yard he has; and wont have nothing to do with no new ways." Brown is so common a name that we may safely use it instead of the real name of the farmer in question, without being deemed personal by any of the Mr. Browns, of whom we boast so many among our readers, and none of whom entertain the slightest repugnance to new ways.

It struck us, on hearing the above remark, that if Brown is right, the Royal Agricultural Society, and other similar associations for the improvement of agriculture, must be wrong, and may as well dissolve themselves. It is true that, like Farmer Brown, they profess a great veneration for practice, that is, for doing things in the way in which they have been done hitherto; at the same time, however, they are justly proud of the vast amount of improvement in farming which they have been the means of diffusing. And improvement means, doing things in a way different from that to which we have been accustomed to regard as practice. We ascertained from the old labourer in question that Farmer Brown is decidedly opposed to guano, and all those new-fangled manures, to which he and many others attribute the potato blight, forgetting that the blight appeared in its greatest force in districts where guano was never seen. We learned also that he is a steady adherent to broadcast wheat and turnips, a strenuous opponent of chaff-cutters, turnip-slicers, thrashing-mills, and liquid manure, and as firm a believer as the old labourer himself in the superiority of waggons over one-horse carts, and the impossibility of ploughing *his* land—a nice mellow loam—with any other implement than the most lumbering of all antiquated ploughs, worked with horses varying in number from four to six. In pressing clover leys, he uses the wheel of his light cart with the body taken off, instead of your new fangled pressers.

It is evident that farmers of this description can derive no benefit whatever, under an advance of wages, from those aids and substitutes for manual labour which the ingenuity, skill, and energy of our mechanical engineers provide in the acres of improved implements which adorn the show yards of all our great agricultural gatherings,

and which some estimate as equal to a reduction of ten shillings a quarter on the cost of growing wheat. Let us now look on another picture by another old servant living under the same master, and we shall see that Farmer Brown, with all his repugnance to new ways, and all the encomiums bestowed on him by his thrasher for his adherence to the good old practice of his forefathers, is not on the most comfortable terms with his labourers in general. This became evident from a subsequent conversation with his shepherd. The conversation commenced respecting the merits of the flock under his charge, from which it passed to the present prices of mutton, lamb, and wool, and of other agricultural produce, together with their effects on the prospects of the farmer. From this he soon made it diverge to the subject most interesting to himself—their effects on the prospects of the labourer. "How can a poor man live and pay house-rent, master, on twelve shillings a week, so dear as everything is now?" "What do you think," we asked in reply, "wages ought to be?" "Why the men, sir, are wanting fifteen shillings, and some farmers are giving it; but Farmer Brown stands out, and wont give no more than twelve shillings. And," added the old shepherd, lowering his voice to a confidential tone and shaking his head, "there were sad doings t'other night at haycart about beer. The men struck for more, and says Master Brown—he likes a drop of beer himself as well as anybody, does Master Brown—says he, 'Why, haven't you had three pints a-day; and is not that enough?' 'Yes,' said the men; but what sort of stuff was it? More like hog-wash than beer.'" We offer no opinion on the sufficiency of three pints as a daily allowance, and on the quality of Farmer Brown's home-brewed; perhaps the men complained without reason: these statements are merely given in exemplification of the feelings abroad among the labourers. "What are your wages as shepherd?" we asked him. "Only twelve shillings a-week, was the reply. On its being intimated that these were certainly not high wages for a shepherd, when day labourers received twelve, he continued—"It is these they take advantage of," pulling off his hat; "it is these grey hairs. I am over sixty, and so they will not give me more than eighteen pence a-day; for, with the long hours I work, my twelve shillings a-week is not more than one-and-sixpence a-day. A wide difference between that, master, and what shepherds get in Australia. If I was ten years younger, I would soon be off there. I was talking about it, lately, to a gentleman who had been in those parts; and he said if I were younger I would do well to go; but at my time of life, and no family about me (for, thank God, my sons and daughters are all out in the world), it would be folly to think of it; I should not live out the voyage." Such is the struggle which will be waged for some time between the farmers and the labourers to maintain the *status quo*, or to obtain an increase of pay. Those farmers who do not entertain Brown's repugnance to new ways, will employ machinery as much as possible, and in general the prejudices of the labourers against machinery have greatly abated during the last thirty years. At one of the first trials which were made of the reaping machine, a party of harvest men, who were standing by, were joked about their occupation being gone. They would not admit that any improvement could be made on mowing wheat, but denied that it would injure them—it would only do work which was done at present by the Irish; adding an epithet which we do not think it necessary to repeat. On the other hand, a farmer who was well pleased with the performance of the implement, and who occupies very largely, triumphed in the declaration that by the next harvest his class would be masters of their men, instead of the men being masters of them. He has the reputation among the labourers of being a *screw*, and his stacks are scattered all over his land. During that harvest, and it was before emigration to the gold fields had commenced from England, he was obliged to give 20s. an acre for cutting much of his wheat.

The moral we would draw from the above eclogue is, the necessity of improvement in the relations between the farmer and his labourers. Wages will rise, from abundance of employment and scarcity of hands, whether prices rule high or low; and in proportion as wages rise, land will be worth so much less rent, as the advance of wages increases the cost of cultivation, minus the extent to which that cost is diminished by the use of machinery and other improvements in agriculture. A liberal policy, —nay, an honest policy, is generally the best; and the farmers will do well to meet the labourers in a conciliatory spirit, to make the necessary concessions with a good grace, and to call on their landlords for aid in making them. Much may be done to make the labourer more comfortable, which will require no pecuniary sacrifice; and those who, like Farmer Brown, are resolute opponents of the modern innovations on the good old system of farming, will do well, in their abhorrence of new ways, to endeavour to re-establish the old relations between farmer and servant as they subsisted before the high prices of the last war, and the system of relief in aid of wages which arose out of them.

SUBSTITUTE FOR GUANO.

"ONE THOUSAND POUNDS REWARD," said the Royal Agricultural Society, "to anybody who will help us to break down a monopoly." And the Council, when they sanctioned such an offer, thought, no doubt, they were moving in the right direction, and that whether their premium were claimed or not, some good might come of it. To their astonishment, perhaps, the Society and its incentive were simply laughed at. Any man who could manufacture a manure equal to guano might have some eighty or ninety thousands instead of one for his patent, with, of course, the option of selling it at as high a price as he liked. It was so not probable that anything would come of the motion: as, if a substitute for guano were discovered, it might naturally be supposed to sell at as good a price.

Notwithstanding, however, the assumed absurdity involved in the announcement of this paltry premium, we are inclined to think that some benefit not only may, but has already arisen from its publication. As far as the actually claiming or carrying off the prize is concerned, we must confess that we are inclined to regard this as of but secondary consideration. The members of the Council, no doubt, gave themselves a tolerably long date before they calculated on being called on to draw a cheque for the amount. What they have done is this—they have struck the first blow at the ill-judged and grasping monopoly arrayed against them; they have excited competition by showing there was a legitimate field for it, and that where the demand was great a good profit might be made at a fair selling price to the consumer. We should be afraid to say how many manure-companies have been sketched out within these few last months, or how many heads have been set to work, more or less directly, to achieve the sole object of this THOUSAND POUNDS. Let the first discoverer, too, have all his just rights, whether his observation be made from the mast-head or the fire-side. The Royal Agricultural Society we are certain would be the last to deprive him of the fair fruits of his enterprise. They only impress on him the policy of keeping a good look out; at the same time they assure him they shall be most happy to deal with him, if they can only do so on fair terms.

Still the laugh was against them. These new discoveries it seems should confirm monopoly, and not destroy it. While Gibbs and Co., in the excellence of their judgment, dole out a limited supply of an inexhaustible article, the manure-dealers will help them out at the same long figure. That is to say, they will stay the farmer from consuming anything like what he requires, by putting its common use almost entirely out of his reach. "High prices and slow returns" shall be their motto, too. Somehow or other, however, competition creeps in here again. It is not one genius only is allowed to sing *Eureka*. How many experiments are there, in the neighbourhood of London only, progressing on to the aim of this THOUSAND POUNDS? How many of our country friends, again, are just on the verge of proclaiming their success? Competition must come. A Royal Agricultural Society's premium would be nothing without it. It was only on Wednesday that we found the sagacious Yorkshireman was quite alive to the opening before him. At the Council dinner of the Yorkshire show, up got our opposite neighbour, with this little speech in his mouth—"He thought the time had arrived when a manure could be manufactured as good as Peruvian guano, and not so expensive. He was manufacturing a manure called nitro-phosphate, and at the present moment there were not less than 1,000 experiments proceeding with it; and he, as well as some other gentlemen who had used it on turnips, was satisfied, judging from the appearance of the turnips, that they would be as good as when manured with Peruvian guano."

This was a Mr. Matthews, of Driffield. And straightway Sir John Johnstone, as a prominent member of the body in question, congratulated the meeting on the Royal Society's THOUSAND POUNDS coming to Yorkshire. But Mr. Matthews would not have it. He managed to raise another laugh at the terms of the Society, as his "not so expensive" did not quite agree with its "not so expensive." The mysterious man in the city, too, with the eighty thousand, was again brought to the rescue, and the farmer thus left to conclude that, as long as he did get good manure, he must not mind what he gave for it. We congratulate Mr. Matthews on his high promise of success, as well as on the pains he is evidently taking to have his invention fairly tested. At the same time we may be allowed to consider how many more Mr. Matthews' there may be beyond Mr. Matthews of Driffield—how many others there are just now "manufacturing a manure as good as Peruvian Guano," and how equally sanguine they may be as to its success. Competition must come in here; and then it will never do to take Gibbs and Co. as the only standard of prices. There may perhaps be only one lot of Lobos Islands, but there

are a hundred heads hard at work to find something as good as it can furnish.

There is, though, competition even here, in what our American friends themselves would call the real genu-*ine* article. On Wednesday, on the same day Mr. Matthews was giving his word of promise at the York dinner, the Royal Agricultural Society were holding their last Monthly Council Meeting for the season, in Hanover-square. Here, amongst a variety of other useful and interesting communications, came the following, which we repeat just as it was sent to us:—

"DEPOSITS OF GUANO,—Mr. Faulks, of Crosby, near Liverpool, and Mr. James Bell, of York Place, Edinburgh, favoured the Council with interesting statements connected with the important discovery of extensive excrementitious deposits of sea birds, on islands and caves along certain ranges of the eastern coast of Africa. They also forwarded to the Council with these statements a collection of samples, showing the varying nature of the deposits according to circumstances of situation and depth. Among these was a deposit containing 80 per cent. of phosphate of lime (without carbonate), and a crystallized substance containing 91 per cent. of nitrate of soda, 'found in small lakes, upwards of a yard and a-half in diameter, in caverns, and in valleys; and surrounding these small lakes, as crystallized incrustations, to an almost incalculable amount.' These gentlemen remark, in reference to the guano: 'The immense amount of deposited guano cannot be calculated; it is found in extensive caverns as deep as could be pierced with two boarding pikes, lashed together, about 12 feet. It is also found completely covering the side of the island less exposed to rains. The discoverer's words are, 'There is enough to supply Great Britain for 20 years;' and he is an old and respectable commander and part owner, whose experience in the guano-trade is of long standing.' The Council ordered their best thanks to Messrs. Faulks and Bell for the communication then made to them on the important question of a cheap and abundant supply of guano to the farmers of this country, and which the Council referred to the Guano Committee of the Society."

This, of course, must be left in some measure for time to test and prove. In the interim do not let our speculative friends be too hard on the Royal Agricultural Society. The day may come when their terms shall sound as no such monstrous absurdity after all—when many, indeed, may be too happy to work under the direct sanction of so high and influential a body. It is not quite Utopian to imagine some such an award being received in a becoming spirit, or the winner so loath to hear, in the words of another Sir John—"Master Shallow, we owe you a THOUSAND POUNDS!"

OUR LABOUR MARKET.

The state of our labour market is daily becoming more and more the engrossing topic at public and private meetings; the more so, probably, in agriculture than in any other branch of industry. It occupied, for instance, a very prominent place at the Gloucester Meeting. During the last four or five years we have again and again discussed the subject in the columns of the agricultural press, pointing out to the labourer and artisan that their legitimate course to procure an advance of wages was to emigrate, so as to reduce the supply of labour in the labour market, instead of adopting the opposite and vexatious course of "strikes," as they were doing; and now they begin to appreciate the soundness of our doctrine, as well as the fallacy of their own. The labourer now finds that the large reduction which has taken place in the supply of labour from Ireland, with the effect of the "findings of California" and the "diggings of Australia," have together done more to better his circumstances than all the strikes which have taken place in our own manufacturing and rural districts; to which may be added the incendiary fires which have consumed so many stack-yards in England, with the still more unpardonable scenes of "ribbondism" in the sister country. Experience has shown him that his employers were better acquainted with the state of the labour and money markets than he was; that "strikes," instead of diminishing the number of hands, very soon empty poor people's pockets, rendering them tenfold more dependent upon employment than ever they were; and that masters are neither to be intimidated by the combined threats of their servants nor the blazing fires of the incendiary, or the still more ruffian deeds of the midnight assassin; but that the moment a diminution of numbers in the labour market takes place, with an increase of gold, that moment they perceive it, bestirring themselves from one end of the kingdom to the other to counteract the tide of emigration by every legitimate means in their power. They never propose combination strikes for the purpose of keeping down wages, although that would just be as effective on their part as on that of their servants; for a very good reason—because they know right well that such would only be adding fuel to the fire they sought to extinguish. Instead of a reduction of wages, they propose building comfortable cottages, with gardens, more contiguous to their work than they now have; thus increasing their wages much more than any money increase which they themselves could ask.

The increase of gold has affected the price of labour, as well as the increased demand which its discovery has given rise to. In other words, two causes operate at present upon the labour market affecting the price of labour, viz., an increase of gold and a decrease of labour, both acting in the same direction, as it were, having for their resultant an increase of price. The former, or monetary view of the question, we shall drop at present, confining our observations to the latter—or, decrease of labour in our rural districts.

The demand which the gold mines of both hemispheres have made upon the home market has been little, com-

pared to that from the other fields of colonial enterprize, and the increased demand for labour at home, from draining and other improvements, machinery, and better management generally—although it probably occupies the most prominent place in the public mind; for one-fourth of those at the gold diggings are not of recent emigration, while the annual number of emigrants exceeds the whole number of gold miners when put together, to say nothing of the increased demand at home, which is probably the greatest of the three; for—

During the last census the population of Ireland has decreased 2,000,000 instead of increasing, as it obviously has always been doing. In other words the late famine and *the increase of emigration have exceeded the increase of population by* 2,000,000 *souls*. Now, when we calculate the effect which such a state of things has had upon the labour market on the one hand, and the fact that more work has been done and is now being done in the sister country and the United Kingdom than previously, on the other, it will be necessary to extend our inquiries further into the facts of the case, in order to account both for past and present circumstances satisfactorily, than emigration itself embraces.

1st. Cheap labour in comparison with dear labour costs the farmer more money than the difference of price indicates, generally speaking. In other words, the quantity and quality of work performed are not proportionate to the daily wages of the labourer. For instance, labour is dearer in Ireland, where wages are from 6d. to 1s. per day, than in England where double those prices.

About ten years ago we agreed to go to the sister country to superintend the employment of a large body of men, comprising the small tenants and tenants' sons of a large landlord, who found it more profitable to give them employment than keep them in the poor-house. At the same time he was not insensible to the value of his money, and therefore justly expected that we would procure him English value for it—doubtless the object he had in view when he secured our services. The poor labourers, while they anticipated the object of their employer thus far, exemplified in their daily conduct the opposite, to make a job last as long as they could, so as to avoid lounging about at home idle, if not going to the poor-house. They actually did less towards the conclusion of a job than at the commencement, especially if it was a large one—fearing lest they should not get another. At the commencement they manifested a willingness to give full value for their wages; but they were the children of experience, and experience had unfortunately taught them that when a job was finished it was sometimes a season before they got another; so that the prospects of want before them led captive as it were their good intentions, and, besides apprehensions of this kind, they laboured under the erroneous notion that their landlord was in duty bound to give them employment, which exercised an equally influential power over their actions. We have actually seen twenty hands do less in finishing a job than two good active ones might have done. To obviate such a state of things, we put the poor fellows upon task-work, giving them full employment; when they doubled their wages, and performed their work at half the price which it formerly cost, although still nearly 20 per cent. under the English level. When they received a shilling per day their work was twice the expense of English work; but when they made two shillings per day it cost twenty per cent. less than English work. Now, at this period there were probably one million to one million and a-half of labourers in a similar position, who could easily have performed more than twice the work they were doing. Hence the consequences which must have followed, had such a plan been generally carried out—consequences which the labourers anticipated, and frequently laid their fears before us; for either upwards of twice the work must have been done, or else more than half the number of labourers turned into the poor-house ultimately. It is easily therefore accounting for more work being done in Ireland with from 400,000 to 500,000 fewer labourers annually.

In the United Kingdom things are in a similar state, although there has not been an equal number of idle labourers. Still pauperism has prevailed to a very distressing extent—in many cases millions sterling having been annually paid in poor-rates; and large as this tax has been, it falls far short of being a fair index of the pauperism of the country, or the state of the labour market; for the greatest sufferers have, in many cases, been those who could not stoop to the idea of entering a poor-house. We could point out many instances which have come under our notice, of men having only employment for two and three days a-week to support themselves and families, and where able-bodied young men willing to work have gone to bed fasting, not having tasted a morsel of food for twenty-four hours, and who with the greatest difficulty could be prevailed upon to make their circumstances known to private individuals able to assist them. It would be absurd to suppose that equitable principles have any influence upon the labour market under such circumstances; for if farmers and their landlords are taxed some £5,000,000 annually, not of equity but of necessity, to uphold an idle population, nothing could be more unjust than to suppose that they could pay their labourers the same amount of wages as they otherwise could do in the absence of such a tax: generally speaking, better to them pay £10,000,000 extra on wages than £5,000,000 on poor-rates: hence the reason why many parishes tax themselves rather than send their surplus labourers to the poor-house. If there are 500,000 labourers in Ireland more than what there is work for, and nearly an equal number in the United Kingdom, the common-sense and practical view of the question is to send them to a colony where there is always an ample demand for labour. There equity will doubtless award them those rights to which labour is always entitled; but to remain at home, where the field of labour is circumscribed by barriers over which equity has no control but by imagination, is to fall into the hands either of starvation or the poor-house. There is no other amends, we say, for such a choice, but to fall into either the one or the other of the two alternatives. For example, there was no relief for Ireland but in emigration. So long as she acted on the opposite policy, just so long did she experience either the one or the other of the above alter-

natives; but from the date of the exodus, relief has begun to be experienced. The depopulation of some districts has, no doubt, been great; but not greater than the previous amount of idleness and poverty indicated. In the province in which we resided (Ulster) there was more than double the number of labourers the number of acres cultivated required; and in some parts of the south which we examined, where the wages were only sixpence per day, the amount of idleness was still greater! And although the decrease of population has been alarmingly immense superficially viewed, yet when we compare the number of labourers remaining and the number of acres they cultivate, with the number of labourers and acres in the best-farmed districts of the United Kingdom, it will be found that emigration for the next ten years must still exceed the increase of population by probably another million, if not two, before the labour market is restored to a state of equilibrium, or before Irishmen stand upon an equal footing with Englishmen in the labour market; while in the United Kingdom itself the poor labourer has not only many idle days still upon his hands, but also a vast amount of running about at certain seasons of the year in looking after jobs, consuming both his time and strength, besides exhausting his pocket of any spare capital laid aside to meet the exigences of old age.

The primary cause of all this is the limited area of land, together with the continual growth of society. Our agricultural population, for instance, keeps multiplying at the rate of about 200,000 annually; while no increase is being made to the number of acres in the United Kingdom. For many years this anomalous state of things has existed—hence the upshot. If we had the 1,370,000,000 acres of unreclaimed lands, of which the Minister of the United States (Mr. Ingersoll) spoke at the Gloucester meeting, alongside our western shores, nothing of the kind would have been experienced. It was no doubt the result of something of this kind, the impracticability of any equitable rules in the absence of such, and the unpopularity and finite character of the emigration theory, which drove Malthus to the unhappy alternative of "starvation." Doubtless our emigration theory has a limit, which such an annual increase of population may possibly one day overtake; but with the progress which steam navigation is making, and with such an area of land before them in either hemisphere, it will be long before Englishmen and Englishwomen are practically called upon to entertain the abstract question when they must cease to exemplify socially the rule of multiplication both in the mother country and her colonies.

Three classes of things conduce to the greater amount of emigration of late than formerly: first, progress of the arts and sciences in our colonies, including the United States; secondly, steam navigation, &c.; and, thirdly, progress of education at home, failure of the potato crop and its consequences, coupled with a surplus population, each deserving of notice.

The great bulk of our emigrants still go to America, where the opening up of her boundless regions by railroads—the growth of large cities affording a sure market for produce—and the progress of the arts and sciences generally, confer upon the new settler many advantages which previously were not enjoyed. The hardships which were once experienced are no longer heard of in the New World; the bugbears of the forest are conquered; so that colonization has at length become, as it were, civilized. Indeed, such is the degree of progress, that our transatlantic cousins are entering into competition with us, at our annual meetings, with their reaping machines, churns, &c., and bidding fair to leave us in the distance! The discovery of gold in Australia, again, and the sanguine prospects of similar discoveries at the Cape of Good Hope, are but indices of progress in the southern hemisphere, where there is probably a wider field for emigration than in the northern. Commercial and manufacturing towns are there fast increasing in number and size, already demanding railway conveyance and all the other auxiliaries of British industry, which cannot fail to give them a different influence upon the over-crowded lanes and alleys of those of the mother country as well as her rural villages. Farther need not be said on this head: the difference is great.

A great improvement has obviously taken place in the conveyance of emigrants to our colonies, in sailing vessels as well as steam-boats, both in point of time, expenses, and accommodation. Our ship-builders and sea-faring men are progressing rapidly in their respective professions. There is still room, however, for further progress, especially to the southern hemisphere; which will doubtless soon be effected, conferring upon the finer climates of the Cape and Australia what they justly deserve—a fair share of our surplus population. The oceanic cheap postage movement belongs to this class.

The third class brings us to the firesides of intending emigrants—no longer an ignorant and superstitious peasantry, but the most intelligent and enterprising of their fellows—men and women who take an interest in reading books, newspapers, and acquiring information from every source, and who delight in writing home to their friends their experience in a colony. We have frequently been shown such letters by our labourers in England, Scotland, and Ireland, the contents of which proved beyond a doubt that Education was doing her work completely in the case of emigration; for those epistles were not the over-drawn pictures which used to appear from amateur pens—either a long way on this side of "the facts of the case" or a long way on that—but the facts of the case themselves practically brought home to the minds of brothers, sisters, and cousins, which left nothing between them and the colony but a few shillings and pence. Those who are not practically acquainted with the powerful influence which they exercise in a family, and even district, can scarcely form any idea of it; for like a "telling speech in Parliament," or article from a well-known pen in the columns of the press, which sets the whole kingdom in commotion, they set domestic circles equally on fire, as it were, dispelling fears from surrounding embarrassments and unfolding prospects too manifest to be mistaken for anything else but the timely invitation of an over-ruling Providence. No doubt the potato failure and the poor-house have had their influence, softening the minds of parties to receive

more favourably epistolatory impressions from a colony: but without education these would have been ineffectual, for epistles could not have existed. Indeed, it is no longer the potato-fed labourer and the inmates of the poor-house who form the bulk of emigrants, but the better-informed class of labourers, small farmers, mechanics, and tradespeople, with not a few from the higher ranks of life. In short, England is beginning to put a proper estimate upon her invaluable colonies, so that it will be found no easy task to stem the tide of emigration so as to prevent harm to the labour market.

Now that the tide of emigration has set in so strongly towards our colonies, supplying the unlimited demand of the labour-market there, it will be no easy matter to avert the extravagant notions of servants on the one hand, and to do them justice on the other in the mother-country; for an intelligent and industrious agricultural labourer is perhaps the most independent member of society in a colony; while there is no one who has greater burdens to bear, and who is surrounded by so many up-hill difficulties, as the British farmer—circumstances which have oppositely their own weight in practice. No doubt science, capital, manure, and machinery will ultimately restore things to their proper equilibrium; but unless our landlords and tenants look more narrowly to their own interest than some of them are at present probably prepared to admit as necessary, serious losses may be sustained before such a level is attained, as will be seen from the sequel. This caution is the more necessary on the part of the latter; for although the former would ultimately suffer most from the want of labourers, yet the loss in the first place will fall more heavily upon the tenant. Neither of them, however, is prepared to do without labourers; and therefore the sooner they contemplate the part which science, capital, and machinery play in the affair of emigration, so much the better.

For several years a laudable effort has been made to provide suitable education for farmers and labourers, according to their rank; and we regret to say that the latter have embraced this, the greatest of all blessings, the most willingly of the two. It is certainly much to be regretted that farmers' sons are to be found with as little knowledge of the various sciences involved in agriculture as the sons of their ploughmen! While discussing this view of the question, parties have often quoted the peasantry of Scotland as being all the better labourers in being well educated. We have found it equally so of Celt and Saxon, whether English, Scotch, or Irish, without a difference. But the old theory of farmers and labourers being equally educated in one school will not do for practice, because it is incomplete, the sons of landlords not being included; for farmers require to be equally well informed in the sciences in question as the landlord. That the parish-school may be greatly reformed in each of the three divisions of the kingdom, and the initiatory branches of science there taught to both families successfully, is plain; but a large body of farmers' sons require something more than this. A farmer, for instance, with a capital of from £2,000 to £20,000 invested in agriculture ought always to be able to give his son a better education than his labourer. Our universities and colleges are subject to reform so as to meet the wants of landlords and tenants, as well as parish-schools, while farmers' sons and labourers' sons who cannot attend colleges and universities must read books and otherwise endeavour during their leisure hours at home to acquire the necessary information. It is not at the parish school that the most intelligent of the peasantry of Scotland acquire their information, but during the long winter evenings and summer evenings after they finish their work; while a large number of her farmers attend her different universities and colleges. There is generally a proneness to attach too much importance to college education and too little to private tuition; for much more information is acquired from the latter source than the former. A small select library has become the most important portion of the farmer's stock; and were their sons to employ their leisure hours as they might or ought to do while serving their apprenticeships at home, they would acquire a very different idea of things, and cease to be looked upon as blockheads by the other classes of society; for they would then learn to appreciate science and its application to practice as they do.

In a colony, science is even, if possible, of greater importance than in the mother country; and hence, with the greater progress made of late years, is producing greater effects. The reason of this is manifest; for in the former the colonist has to start without precedent for a guide, whereas in the latter farmers follow the practices of their forefathers, without, in many cases, being able to assign the reason why, or they obviously would choose better. Hence the rude practices adopted in our colonies before emigrants were properly educated, and which have formed the basis of our colonial agriculture, very lately pointed out in the columns of this journal as an exhausting system—so much so, that almost the whole continent of North America was rendered unfit for profitable cropping before science discovered to her farmers the fallacy of their farming. During this rude age of American agriculture, labour was all that was thought upon. The forest fell before it; the rattlesnake and prairie dog fled before the fires of the labourer; while seed time was followed by harvests so abundant as to procure for the country the appellation of the "Land of Plenty"—all the result of *brute labour*, so to speak. But a short experience taught the American farmer that something more was wanted than brute labour in successful agriculture; for scarcely had science dawned upon this benighted period, when he found that it would take a sum nearly equivalent to the national debt of England to restore his exhausted forest and prairie lands to their original fertility. Hence the demand which sprung up for science; and the progress which has been made of late in improved agriculture, geology, chemistry, mechanics, and the other sciences involved, having been brought to bear upon the cultivation of the soil with as much success as in this country; while the soil is fast being restored to its primitive fertility, yielding threefold produce for half labour—a result with which we are all familiar at home, for bad farming always requires more labour than good.

With regard to capital, machinery, and manure, such are now universally admitted as absolutely necessary to

successful agriculture along with science—in other words, the increase of science, machinery, and manure now demanded by improved agriculture requires an increase of capital. As we progress in science, practice is becoming more and more artificial—receding farther from the natural or rude systems of patriarchal times, and consequently requiring more capital to carry on her labours successfully. All our arguments in favour of tenant-right centres in this point—*the successful investment of more capital in agriculture*; hence the impropriety, nay, the absurdity of opposition; for unless more capital is invested in the British soil, home agriculture must eventually be trodden under foot by foreign and colonial. Unless parliament removes all those obstacles which stand in the way of draining and other permanent improvements being carried out, and of science, machinery, and manure being brought to bear upon the cultivation of the soil and the husbandry of its produce, farmers and labourers must of necessity bring their skill and capital to bear upon our colonial soil, where no such obstacles are experienced, and from thence inundate our markets with their untaxed and cheap produce! There is only one way of averting this twofold calamity of dear labour and cheap produce, and therefore it would be superfluous to enlarge upon it. We must have tenant-right to secure the permanent improvement of the soil, and cheap patents to secure the labours of the inventor in procuring for us the most effective machines and manures, on terms similar to what American farmers enjoy—manures and machinery not now in existence. Were patents procurable for some £5, as in the United States, we know parties who are prepared to take out patents for steam ploughs, manures, &c., and to invest a few hundred pounds in the undertaking, with every prospect of success; but the absurdity of being taxed £200 on each patent, or £1,000 on five, for conferring upon Old England what her exigencies demand, is too gross to be swallowed by them, for they will become citizens of the new world first, or as soon as their leases and engagements are out. There are silly people who cannot keep their inventions to themselves, for they always ooze out somehow; and there are selfish people who think all inventors silly—to both of whom we briefly say at present, remember the old story of "locking the stable-door after the steed is stolen." But of this after.

Now the application of more science, capital, manure, and machinery to agriculture, producing double the produce with probably one-half the number of farm-labourers, horses, and working cattle, is not the cultivation of the soil, and the husbandry of its produce with less labour but the bringing of the more elevated and scientific branches of labour to bear upon the soil and its produce, so that more labour is actually employed in modern times than was during patriarchal times, when the ploughman made his own plough and the farmer his own shoes, and when science was almost exclusively monopolized by the clergy and a few lay favourites, much of it appearing to them little better than alchymy and witchcraft. Capital may always be taken as the measure of labour. Into practical details, here, we need not enter; for these must appear manifest to our readers at first sight. We cannot, however, pass so hurriedly over the important changes which this difference in the quality of labour as applied to the soil is producing upon our colonies, and the effect which it has upon the labour market of the mother country. For example:

So long as the American farmer followed his old exhausting system of only applying manual and brute labour to the soil, he and his own brutes had to do the work themselves: for under it newly-arrived emigrants, who had as many dollars as would buy a few acres of land, found that it was better to enter the "bush" penniless than to work for a penniless master, for, in the former case, they had regular employment, whereas in the latter it was otherwise. No doubt, at times, very severe trials were experienced in the "bush," under sickness, or the "fever of the country," as it is termed; but the sympathies of a penniless master, under such circumstances, were not sufficient to turn the balance. But now that science, manure, and machinery are being brought to bear upon the soil, capital is becoming a *sine quâ non* with American farmers, as with those of the mother country; and it is this additional capital brought to bear upon our colonial soil, including railroads, which is removing our labourers faster than our population increases, and must continue to do so until an equilibrium takes place in the demand for labour. Emigrants find that, on their arrival in America, they are sure of making from 2s. 6d. to a dollar per day; and that, from the cheapness of provisions, they can soon save what capital is necessary to reclaim and stock 150 acres or so of land, avoiding all the hardships which formerly surrounded the penniless settler in the "bush," while railroads and the higher branches of labour employed afford a better home market for their produce. The facts of the case are patent to them, the moment they enter into the service either of a railway contractor or farmer; and those facts they communicate to their relatives in the mother country, as formerly stated. Hence the consequences which follow—the depopulation of whole districts almost, as in Ireland and some parts of the Highlands of Scotland, where the wages are the lowest, and the circumstances of the peasantry the most distressing.

When we take into consideration the contrast between the circumstances and prospects of the labourer at home and the labourer in the colonies, the boundless demand for labour in the latter case, and the limited demand in the former, while sowing, hoeing, reaping, mowing, and thrashing-machines, &c., &c., are daily circumscribing this limited demand into a narrower circle, we need not wonder at the spirit which prompts the poor labourer to emigrate, on the one hand; while to restore the demand to a state of equilibrium will appear no easy task, on the other. Science, capital, and machinery have to make great progress in the mother country, before they leave the science, capital, and machinery of the United States of America, and colonies generally, so far behind in the march of improvement as to restore an equilibrium in the demand for labour; for the demand is now no longer confined to the pauper populations of Ireland and Scotland, for it was only the other day, for instance, that we saw a handbill stuck upon the boarding

which surrounds the crystal palace, Sydenham, advertising for 200 labourers to go to Australia, to railway work, a free passage being allowed to each labourer and his family. With free passages, cheap land, and the gold-diggings before them, what is to restrain labourers, and what save the English landlord and tenant from suffering in such a revolution?

We have already stated that there were only two alternatives before them—the investment of more capital in the permanent improvement of the soil by the landlord, and the abridgment of labour by machinery on the part of the tenant. Now, on entering the labour market to hire labour for carrying out those means of safety, how unfortunate are we! For before Ireland has got her "Land Improvement" and "Tenant-right" statutes, her surplus and cheap labour has crossed the Atlantic; and before Old England gets even this length, one-half of her labourers will be either at the "diggings," or earning half-sovereigns per day on the railroads of Australia; while there will be no speaking to the other or remaining half under 7s. 6d. per day. Had the £5,000,000 which have been annually spent in poor-rates since we advocated the cause of tenant-right been invested in the permanent improvement of the soil, upwards of £100,000,000 had been invested before now, returning profits exceeding in amount annually the whole rental of the kingdom!

It is certainly some consolation to hear the Lord High Chancellor promising, from his seat in the upper house, to "take into consideration" the case of England after that of Ireland had been disposed of, and further, to hear the Royal Agricultural Society of England urging the propriety of building cottages and gardens for labourers contiguous to their work. But is not this practically, after all, only proposing to "lock the stable-door after the steed has been stolen"? No doubt machinery can be invented for abridging labour in the permanent improvement of the soil, as in its annual cultivation; *but when?* After our inventors have established their reputation in a colony! After this has taken place, we shall get steam-ploughs and draining-ploughs from our colonies, as we are now getting reaping-machines, churns, &c. But is this the way to get further a-head of our colonies in mechanical science than we now are, so as to restore the equilibrium of demand in the labour market? For an equilibrium in mechanical science, and in the arts and sciences generally, has for its counterpart *an equilibrium in the price of land and labour*. Are English landlords prepared to accept American rents—a dollar and a-half per acre, or 6s. 6d., for their best land? If not, it is high time they bethought of practical means for bringing the labours of inventors of useful chemical and mechanical inventions to bear upon the permanent improvement of the soil; for the present plan of taxing them £200 before they commence working, is obviously anything but practical. It is not, for instance, calculated to restore an equilibrium of demand; for America will give each 600 acres of land, and some 20 patents for this money, with a much wider field of agriculture for their operation—hence the obvious conclusion. It is usual to give servants earnest-money, instead of wringing from them a tax greater probably than their wages!

The labour of the useful inventor is that upon which the safety of English agriculture at present depends, and therefore to allow him to emigrate to our colonies—and not only to allow him, but actually to tax him, so as to effect his expulsion from our shores with as little delay as possible—is not only short-sighted economy, but something approaching to suicidal. American agriculture has long been thus dependent, hence the policy which her government pursues—a policy which all our colonial governments feel disposed to imitate—viz., that of encouraging the emigration of English inventors, by giving citizens patents for some £5 each, and strangers £120. At first sight we were disposed to question the propriety of this extra charge against the English patentee, on the ground of excluding useful inventions; but on taking a second view of it, and the emigration maxim involved, at once became reconciled to the soundness of the theory. The theory of the Union may be thus stated: "America wants steam ploughs or cultivators, sowing, reaping, and threshing machines, &c., &c., of the most improved construction. In England there are large numbers of small capitalists of from £50 to £500 each, the sons of farmers, implement makers, engineers, &c., who have got an excellent education, are men of great talents, generally speaking, and masters of the chemical and mechanical sciences; are useful inventors, careful of their money, being as free from speculation in patents as in any other branch of business, and therefore they form the very class of emigrants which America wants; consequently she must do everything in her power to encourage their becoming citizens, and discourage their taking out patents as foreigners, as success here might retain them in the mother country. If, for this purpose, her Commissioner of Patents holds out in his right hand a grant of six hundred acres of land, with a patent, for £120, and in the left a patent only for £120, then there is not an intelligent young farmer in England, of the class in question, who will not lay hold of the acres, for by so doing he can start his steam-plough in her fertile prairies, apply his patent manures and export to Mark Lane or Liverpool one hundred quarters of wheat, the produce of his American patents, so to speak, to take out his English patents, and get his relatives to work the inventions or dispose of them. Implement makers and engineers are not generally reckoned less intelligent than farmers in the mother country, and will therefore embrace the more inviting field which the boundless realms of the New World hold out to the progress of chemical and mechanical science, and the comfortable settlement of their families, when compared with the limited and crowded area of the mother country."

It will readily be perceived that the American patent-office theory comes practically home to meet the exigencies of the mother country; and that England, by refusing an honest and fair settlement of the tenant right and patent law questions, or the investment of capital in permanent improvements, manures, and machinery, is doing all she can to encourage emigration and forward the interest of our colonies, including the United States, in opposition to her own. That she must do otherwise requires no proof; for the stream of gold which is now flowing into either hemisphere will soon intersect the boundless continents of America and Australia with railroads, bridge the Atlantic and Indian Oceans with steam-boats, and thus increase the facilities for emigration and colonial enterprise in a tenfold degree. Hence the result of delay.

(To be continued)

FIXED STEAM ENGINES *VERSUS* LOCOMOTIVE.

As was justly observed in the leading columns of this journal some time ago, that the London Farmers' Club closed its summer meeting with "an appropriate prologue to the Gloucester and other exhibitions" about to follow—a discussion "On the Comparative Advantages of Fixed and Portable Steam Engines to Agricultural Purposes." For many years the attention of farmers has been turned to the science of mechanics with marked confidence as one of the most promising resources from which amelioration could be had, especially since the Great Exhibition of 1851; and from the merits of the question at issue, and the favourable notice taken of it by the agricultural press, the Farmers' Club may justly come to the conclusion that the correspondents of the *Mark Lane Express* have not responded to the subject as they ought to have done. For our own part, we frankly plead guilty. It is no easy task for correspondents in our situation keeping pace with the progress of the times. Steam itself, with all its gigantic powers, scarcely keeps up with the enterprising spirit of the age, running some considerable risk of falling behind in the race, if not being wholly superseded by agents more active. Correspondents of any journal ought certainly always to respond to the different topics to which its leading columns may direct attention; and in doing so, facts should be fearlessly stated on all occasions; but unless they are supplied by practical farmers, how is it possible that justice can be done to agriculture? for science can never be safely separated from practice in any branch of it. At present the complaint is universal among scientific writers in connection with mechanics, chemistry, geology, botany, zoology, and the other sciences involved—and not more universal than well-founded—that farmers do not communicate the result of their experience as they ought to do, to the different papers they themselves read. Literary men may do much to keep science advancing and practice awake; but blanks are always of necessity left for practical men to fill up, and should not, therefore, be neglected by farmers. We were not insensible to the merits of the question at issue; quite the contrary, for we thought the importance of the subject just such as to demand the experience of the Gloucester meeting of the Royal Agricultural Society before further discussion of it. This great gathering has now been concluded with more than ordinary success in both departments. Many of our readers have had a fresh opportunity of examining the comparative merits of fixed and portable steam engines, being thereby better qualified to judge for themselves; and we shall now proceed to throw out a few practical observations on the subject, in the hopes of stimulating the present inquiry and aiding future practice.

In glancing at the comparative merits of two articles of so recent introduction as the fixed and portable steam engine, it will be necessary to take a retrospective view of the question apart from the prospective; for the experience of the past will be found of such an exceptionary character as to be wholly unfit for adoption as a rule for the future; and, besides this, the progress of science is so rapid as to render it very problematical whether what best suits the practice of to-day may do so to-morrow. In short, the antagonistic view of the question, so far as the future is concerned, is rather speculative ground, which ought, therefore, to be cautiously entered upon—ground which the Royal Agricultural Society avoids in its prize list, by placing both upon a footing of equality; while the past is surrounded with so many antiquated practices peculiar to itself as to require more discrimination to judge of circumstances than has in too many instances been applied. For example, taking the retrospective view of the question first:—

Scotland, it is said, furnishes evidence in favour of the fixed engine; while England, although undecided of late, was previously in favour of the locomotive. The first question, therefore, which we meet with here is this—Was it the calculating intelligence of our northern neighbours which preferred the former, and the easy unconcern and want of enterprise on the part of ourselves which gave rise to the latter? Nothing can be further from the truth; for in both cases prior circumstances account for the difference, apart from the merits of either engine. For:

In England, prior to the introduction of the steam engine, portable threshing machines were in general use, more corn being thrashed out by them than by fixed ones. This practice gave rise to a class of jobbers, who kept one or more machines, with sets of men and horses, travelling from farm to farm, and thrashing out the crops at so much per quarter, according as consumption demanded; so that the work became, as it were, a distinct subdivision of labour, apart from the other operations of the farm. The expense of keeping thrashing teams was great, consuming no small proportion of the charges of the jobber, often leaving little over as profit to himself; consequently the locomotive steam-engine, to supersede horses, was an important discovery for him, and embraced accordingly. Farmers who had portable thrashing-machines, and several farms each, were similarly situated; indeed, to many of them the economy of horse-labour was a more important question than even to jobbers. The question as to the comparative merits of fixed and portable engines was never once raised by either of them. It was theoretical speculation far beyond their limits, especially in the case of the latter; for it would be practically absurd to talk of fixed engines for the jobbing thrasher; and if so in his case, why should it be otherwise in that of farmers occupying several farms, who each made one portable thrashing-machine and a regular set of hands do the whole work of thrashing? His hands were trained to the outdoor system, his barns and stack-yards constructed for the work; so that the practical question with him lay between the locomotive,

—or, rather, steam—and horse-power; and here the advantages were so manifest as to leave the answer too legible to doubt that he who runs may read.

In Scotland primary circumstances were very different, for there fixed thrashing-machines had been erected almost on every farm of upwards of fifty acres, driven either by water, wind, or animal power, prior to the introduction of steam-engines. Many farmers there occupy several farms, as well as in this country, having a fixed thrashing-machine on each. Where there is a deficiency of water, a horse-power is also attached; and sometimes, where the fall admits of it—as it often does in the hilly districts, the general feature of the country—the water, after leaving one wheel, falls upon another; so that it produces a double effect, the driving-machinery of both wheels acting in concert. In travelling in Aberdeenshire we once saw two water-wheels and a horse-power acting together in thrashing. There was too little water to thrash out the stack, and a full team of horses could not be conveniently spared to thrash separately. Indeed, it was the latter end of seed time, and the farmer was unwilling to break the labours of the field. Four working bullocks were used as one team, two going the morning yoking, and the other two the afternoon. The farmer's riding or gig horse acted as an odd one, and the two spare oxen were consequently yoked in the machine, the sluices raised, the water thrown upon both wheels, and the work of thrashing proceeded with to completion. We quote this example to show the amount of machinery brought to bear upon the work of the barn, and the spirit with which our northern neighbours embraced it; for in this case, as in the generality, the whole was erected at the expense of the farmer. Both wheels were under ground, and of considerable diameter, while the "horse-course" (as it was termed) was of the old fashion, roofed over, with the machinery above the horses; so that the investment must have been considerable. In travelling from the one end of Scotland to the other, we only recollect meeting with one portable horse thrashing-mechine in working order, and it was seldom used, and of English manufacture. Such being the circumstances of the Scotch farmers, the question with them lay between the fixed-engine, or steam and water, wind or horse-power, and not between the locomotive and those several powers; for their buildings and stack-yards, with their "sheaf lofts," "corn barns," "chaff barns," "straw barns," "horse-courses," and machinery, were only adapted for the fixed-engine. Where there is an abundance of water, it has, of course, maintained its ground as the most economical motive-power; but in the case of the other two, steam has almost entirely superseded them, the "horse-course" in the majority of cases serving as the engine-house, the only additional expense required being the filling up of the openings for the horses entering with mason work, and erecting a chimney.

Such being the case with the two divisions of the kingdom, it is altogether inconclusive to bring forward the example of the one in favour of the fixed engine, and that of the other in favour of the locomotive; for it is manifest that the farmers of both were influenced by circumstances more tangible than the mechanical merits of either, consequently the question at issue is one which experience has yet to settle.

The causes to which those different circumstances are to be attributed are not without interest, as they are not yet wholly inoperative. In England leases for terms of years are the exception, yearly tenancy being the general tenure; consequently English farmers had no encouragement to erect horse-courses and fixed machinery. "Between Maiden Kirk and John O'Groat's" there is not a single farmer, we venture to say, who would have erected a horse-course and thrashing machine had he been similarly situated; or, what is the same thing, who has done so during the last year of his lease, and before a renewal was agreed upon, however good may have been the understanding between him and his landlord. Next, the climate is more congenial for out-door thrashing than in the north; while the character of the stack-yard and farm buildings, arising partly from this diversity of climate and partly from the system of farming, are better adapted for the locomotive than the fixed engine. And, lastly, portable thrashing machines require finer machinery than fixed ones; and at the period in question our agricultural implement makers were vastly superior to their northern neighbours in the manufacture of machinery of every kind, so that they were better qualified to supply the peculiar demands of the times, according to the exigencies of farmers, than they otherwise could have been; giving rise to a branch of industry—the thrashing of corn by jobbers—practically unknown in the sister country. But for them, the jobber could never have contracted to thrash farmers' crops as they required them, at vastly less money than they themselves could do by the flail, and to thrash them better also.

Scotland, again, is "the land of mountain and flood," affording innumerable waterfalls for machinery; and in this respect held out much greater encouragement to her farmers to thrash corn by machinery than was at first experienced in this country. The first impulse, therefore, was greater, while machines were almost driven by water; thus impressing upon the country, as it were, the general design of fixed machinery. At this time farm buildings were rude in the extreme, and wholly unfit for the improved system of husbandry being introduced from this country and the continent of Europe; hence when new ones were designed, barns were planned out for fixed engines. Horse-machines in course appeared; but the character of the buildings had assumed a definite form, the climate of the country forbidding out-door thrashing in the most favourable localities, and altogether excluding it during the winter. The shortness of the winter day, again, thrashing being sometimes performed by candle-light every morning; the dependence of cattle upon newly-thrashed straw daily; the state of the labour market, servants being engaged by the year; and the more artificial state of things generally, were all in favour of fixed machinery rather than locomotive.

All these things, therefore, when put together in the case of either country, are sufficient to account for differences of existing circumstances, without having recourse

to national personalities, if not to Flodden Field and Bannockburn, for primary causes, as is too often done by disputants in agricultural matters.

Prospectively viewed, the question at issue will still be so influenced by existing circumstances as to be left unsettled, as it were, for many a day to come. The practice of *To-morrow* will always experience a difficulty in shaking from off her shoulders the burdens which *To-day* has placed upon them; still science is progressing, and those burdens are daily becoming lighter and lighter as we advance. If the English farmer, for instance, receives a proper settlement of the tenant-right question, as we hope he will, it may enable him to get over the difficulties yearly tenancy involve him in; but until such is obtained, it would be practically absurd, in many instances, erecting fixed steam engines at his own expense, whatever may be their abstract merits mechanically. The question at issue between the fixed engine and locomotive is disposed of by circumstances connected with the political economy of land—abstractedly, weightier than all the mechanical principles involved. Bad lawyers outweigh bad farmers, and are therefore the greatest calamity of the two in a national sense, in spite of all that has been said to the contrary. The improper subdivision of land into farms, in accordance with the political notions of antiquated times, the inconvenient situation of farm-buildings at some untoward corner, roads and fences equally antiquated, and all chained to the soil by laws almost as arbitrary and binding in character as that of gravitation, positively prevent the farmers of England experimentally testing the comparative merits of fixed and portable steam-engines for agricultural purposes, in accordance with the laws of mechanical science, as they otherwise could do; for a farm inscribed within a radius of half a mile, so so speak, would comprise an area of some 600 acres, sufficient to employ a fixed-engine—a radius of one mile, upwards of 2,000; so that if farm buildings were centrally situated, all the objections brought against carting out manure in seed time, and home produce in harvest, would disappear. We ought here to refute another objection to fixed-engines, which too many English landlords are to blame for entertaining towards their tenants, viz., the want of capital. "Our northern neighbours are more calculating, and have more capital-differences, which do everything in farming," say they. But what say the facts of the case? Simply this—that after a race of some half a century, the English farmers are found wealthier, as a body, than the Scotch; a fact so notorious that no one can deny it, or seeks to deny it. Hence the obvious conclusion, which we leave our readers to draw for themselves.

On the other hand, in Scotland—the land of fixed-engines at present, and buildings constructed for them—such things do not last for ever, so that at the expiry of leases, incoming tenants more especially may think of locomotives, unless justice is done them on the topic of tenant-right, leaving the farm as they found it, should the landlord propose an increase of rent on the renewal of the lease without putting his hand into his own pockets. And besides the argument here involved, which must always influence more or less the mechanical merits of the two engines, until the tenant-right question is fairly settled, if ever we get the length of cultivating the soil by means of steam-power—a point to which we are obviously progressing—it is very clear that the small farmers of the north cannot uphold two engines and two engineers at work economically; so that the fixed-engine will have to give way to the locomotive, as horses in England have done to steam. Independent of the many mechanical arguments in favour of the fixed-engine for thrashing corn, and doing all kinds of similar work which can be economically concentrated to one point, it is obvious that practice will never be able to get over the biassing influence which such discoveries will have upon the comparative merits of the two engines upon small farms; for so long as we have thrashing only, any intelligent labourer may manage the engine; but when once we get the length of steam culture, we shall have railroads also, and full employment for mechanical engineers. On large farms two engines may be kept, and one engineer—such is reconcileable with the ordinary details of practice, and therefore may be carried out.

An objection to the locomotive engine requires to be answered before concluding, viz.—The climate of the north, and, indeed, of the whole of the west coast of Great Britain, including all Ireland, where it is said to "rain for ever during winter," precludes outdoor thrashing.

The outdoor thrashing has not a foot to stand upon, either as to the health of the labourer or the economy of labour; for in one of the best climates of England we found that we could not depend upon good days for thrashing. Quantities of litter may be thrashed out at a time; but cattle require to be littered daily, and the straw kept dry in the straw-barn, and where it is given for food, either separately or mixed with hay cut into chaff, it requires to be fresh thrashed. Now sheaves can be more easily removed into the barn, there thrashed, and the straw placed in the straw-barn, than it can be on the out-door system, being done with less toil to the labourer. But besides this, how can the work be accomplished in rainy seasons of days and weeks together, with probably only one hour or two towards night to fill the sheaf-barn, which may be done in less than half the time it would require to thrash? Both in harvest and in thrashing time we have often wished that the stack-yard was roofed over, as well as the straw-yard. We are certainly receding slowly but surely from the out-door practices of oriental climes, and progressing to something of the kind contemplated. In point of fact, straw-yards are already covered over, and stacks, as they stand in the stack-yard, removed into the barn on railways in wet weather as in dry; so that the case of the labourer, as well as the farmer, will demand thrashing in wet days rather than dry, for there is nothing affects his health sooner than a wet shirt or an empty pocket. If barns and machinery are properly constructed, less annoyance will be experienced from dust inside than outside, and less toil also; for indoors the winnowing machines draw the dust into the chaff-barn, while outdoors it is gene-

rally partly blown into your neighbour's eyes and your own by eddy winds, and partly a long distance from the stack-yard: and if the wind be anything high, it is much more fatiguing handling both the sheaves and straw. It may be all very well for an amateur farmer standing at a respectable distance with his hands in his pocket to think the contrary, and for silly labourers to join him who have never wrought indoors, save in some badly ventilated and ill-conditioned hovel of a barn; but what are the value of such arguments to practical men who have served an apprenticeship indoors and out, and who can perceive the difference between a little dust upon their own coats, &c., &c., from labourers' wet shirts? In short, when we get steam ploughs, science will easily triumph over the wet climate of the north, and also the south, by means of railroads rolling stock and roofed stack-yards, the locomotive working indoors as well as out. The thrashing machinery may be fixed where there is only one farm; alterations of this kind are simple.

In these observations we have endeavoured as much as possible to take a different view of the subject from that taken by the London Farmers' Club, leaving the question at issue just where Mr. Ransome left it—in the hands of Experience, who will doubtless eventually give a more unbiassed answer than she now does. At present, practice cannot do otherwise.

THE LABOURER—PAST AND PRESENT.

How to escape from the evils of a redundant population—how to feed them—how to employ them, were but lately anxious questions with our statesmen and philanthropists. Three years have scarcely elapsed since the haunts of misery, mendicity, and vice, which abound in all our great towns side by side with opulence, elegance, and luxury, were laid open with unsparing hand in all their deformity. Graphic sketches were presented, which some suspected to be exaggerated for the sake of effect, but which those who had the best means of forming a judgment knew to be but too faithful portraits.

The agriculturists exclaimed with too much exultation, Behold the bitter fruits of commerce and cotton-spinning! see the fatal consequences of attempting to make our once merry England the workshop of the world—that grim Moloch to which the poor and the farmer have been sacrificed! Contrast the cellars of Liverpool and Manchester and the back-slums of London with the dwellings of a happy peasantry, inhabitants of many an Auburn "where health and plenty cheer the labouring swain." If they have not the high wages of the manufacturing population, they have enough for their wants, and they are preserved from those temptations to debauchery which are caused by excessive earnings—

> Their best companions, innocence and health;
> And their best riches, ignorance of wealth.

We give what life requires, if we give no more. More we would give if you would let us have higher prices. The support of all the poor of the land falls on us. We must employ them whether we want labourers or not. We employ them under the penalty of feeding them in idleness if unemployed. We cannot pay high poor-rates and give high wages. Our labourers have, at any rate, air and exercise. Contrast their ruddy complexions with the wan and sallow looks of the operatives of Manchester and Stockport, or the grinders of Sheffield—smoke-dried, choked with cotton-fluff, or poisoned with steel-dust. "Pull the beam out of your own eye," was the reply—the same reply which the slave-breeders of Georgia and Carolina made to the ladies of Stafford House—"look at the real, not at the poetical, condition of your rural labourers." And straightway there issued forth a host of reporters, and "our own correspondents," and our "commissioners," to confirm the truth of details which had long been buried in the blue books which no one reads, and to put them into readable shape for those to whom all reading is too dry except the columns of a newspaper or the latest number of the last new novel.

Then the public became acquainted with the system of cottage-clearing in close parishes, and the evils of the gang system to which it gave rise. Then we learned how the happy peasantry were driven from the rural districts to the towns, how the farm labourers frequently walked from six to ten miles in going to their work and returning from it; and how travelling agricultural schools of immorality existed in the waggon-loads of big boys and girls, carted about the country, that wealthy farmers may save a few shillings an acre on their weeding, stone-picking, and their haymaking. The rural labourer was followed to his home; and we were told what that home is, and how whole families, and more than whole families, are crowded into one sleeping room. We learned that this state of things prevails in a civilized and Christian country, not only among the refuse population of our towns, but among the dwellers in many a rose-covered cottage; making many a smiling village but a whitened sepulchre. The clergy came forward to corroborate the truth of the hideous details; and all impartial men admitted that the state of our labouring population was anything but satisfactory—that it was far different from what it had been somewhat less than a

century ago. They admitted that between the labouring population of the town and country there was little difference. The physical condition of the former, when in employment, was probably the best: the moral condition of both was equally bad. Both were living more like the beasts that perish than like rational, immortal, and accountable beings. Both presented the same multitudes of unmarried mothers, of unbaptized and uneducated children; the same neglect of religious ordinances, the same amount of empty churches and crowded beer-shops. All lovers of our country stood aghast at the picture thus suddenly revealed, which had been long before their eyes unseen through the thin veil which covered it. The haters of our country—the only country where they can find rest for the sole of their foot—exulted at the proofs which we had collected for them of the Decadence d'Angleterre. Philanthropists looked around them in vain for a remedy; the evil was too deeply seated and too widely diffused to be grappled with. Every nostrum which had occupied the attention and enjoyed the favour of the public for a quarter of a century had been tried in vain; spade husbandry and five-acre farms were a failure, as any one might have anticipated who had studied their effects in Ireland. The allotment system was a poor substitute for cottage gardens. Emigration was impracticable, so it was thought, on a scale sufficiently large to produce any effect in raising the labour market and improving the physical condition of the labourer. Where were the funds by which it was to be supported? Where could ships be found to carry out the emigrants? The case was hopeless; we were standing on the edge of a volcano; everything would be swept away in the approaching eruption of our dangerous classes. Some declaimed against capital: some, from whom better things might have been expected, turned their eyes towards a modified socialism: others would have made poor men good and happy by act of Parliament. All forgot the lesson taught by the presence of a few green spots amidst the wilderness—the lesson that the employers of labour, whether manufacturing or agricultural, exert an influence and possess a power for good or for evil over the condition of those whom they employ more potent than that of laws enacted by Parliament.

How changed is the picture now! Thanks to a gracious Providence, there is now no complaining in our streets; the millions were never so well fed, never so well clothed as at present. The prosperity which commenced among the manufacturing population has reached the rural labourers. There is no longer a merit in employing labourers: the difficulty is where to find them. There is no longer a hardship in being compelled to employ labour: the workhouses are empty, and the poor's rates are falling. Man is no longer a weed—we may add, is not likely soon to be a weed again in England. The problem has been solved of a self-supporting system of emigration, and to the peasantry of Ireland belongs the merit of having given the first solution of it. If the time should ever return when two labourers shall be looking for one master, they know how to transport themselves to lands where two masters will be looking for one labourer. The price of every article of agricultural produce is rising. Prices are rising because the millions are consuming largely: that no one can deny; and for once in the course of our history the advance of wages precedes the advance in the cost of the labourer's food. We will not attempt to investigate the causes of this change; we will leave the advocates and the opponents of free trade to discuss the share which it has had in producing it. Our opinions of the effects of the new gold fields on prices are on record—we do not expect any great monetary revolution from that cause; but the sons of toil, the men of thews and sinews who knew nothing of their own county twenty miles from home, have been tempted across the ocean by the gold fields, and the ocean has lost its terrors. The tide of emigration has only slackened because wages in the old country are approaching the rate at which labour is remunerated in new countries.

The points to which we wish to draw the attention of the farmers and landowners of England are, how they are to prepare, in the words of Lord Ashburton, to meet this happy change in the relations between the labourer and his employers, which is to raise him from serfdom to independence, and how advantage may be taken of this change in his physical to improve his moral and intellectual position; how he may be "awakened into a new life of energy and usefulness from that sluggish indifference into which his hitherto degraded position has cast him, so as to make him a better workman, a better parent, a better citizen." Well might the President of the Royal Agricultural Society declare that this change only was wanting to fill the measure of blessings which Providence has showered on our country; and well might he rejoice that he had lived to see it.

Emigration and abundant employment have raised the rate of wages. Increased wages have produced increased consumption by the millions. With increased consumption, we have deficient crops at home, and the prospect of diminished supplies from abroad. The crops are short—in France as well as here; and France, which had been an importing country till 1848, and then suddenly became an exporter, is now returning to

the state of an importing country again. She is quarrelling with her sliding scale, and throwing open her ports for the admission of foreign grain. Political clouds lowering in the eastern horizon are curtailing our supplies from the countries bordering on the Black Sea; and these, in conjunction with France, have furnished the principal portion of the increased imports which we have received since the repeal of our corn laws.

A good potato crop would have made up in some degree for the falling-off of that of wheat; but the potatoes are again smitten with that mysterious blight, which baffles both practice and science, which has effected a revolution in the social condition of Ireland, which has expatriated a large portion of the Celtic race, and deprived the farmers of England of their periodical supply of itinerant reapers. The potato blight thus gave the first impulse to that advance in the wages of agricultural labour in England which the attractions of the Australian Gold Fields have confirmed and extended.

There are many who think it probable that, in the course of a few months, we shall see wheat selling at 70s. the quarter. Should a continental war arise out of the eastern question—even a war in which, contrary to all precedent, England shall not be involved—we may have, while it lasts, a permanently higher range of prices than we have seen since 1815. Should peace be maintained, famine prices will have stimulated increased importation from abroad, and extended wheat-sowing at home. A revulsion will follow, and prices for several years will be depressed as much below the natural free-trade level, whatever that level may be, as temporary causes shall have raised them above it.

In either case, the farmers will be obliged to pay a higher rate of wages than they have been accustomed to since the commencement of our present period of peace, now approaching its fortieth year; for the price of labour is not regulated by the cost of the labourers' food, but depends, like the price of everything else, on the state of supply and demand. If there are any who doubt this, let them look at the United States, and at Canada and Australia.

High prices, during the present year, will be accompanied by a deficient crop, and therefore must not be considered as all gain to the farmer, even though unaccompanied by an advanced rate of labour, which is inevitable. How are the farmers to meet these prospects? What will be their position under such a state of things, compared with what it was, under conditions apparently similar, between 1800 and 1812, which are regarded by many as the halcyon days of farming? At that period, when prices were rising, and when from an increased demand for labour, caused by the development of our manufacturing system, by extended cultivation, and by the numbers employed in carrying on the war, the value of labour was rising also, the farmers possessed resources for paying their labourers which they do not possess now. When Saturday night came, they had two purses to go to—their own, and the money raised for the relief of the poor. In rural districts the farmers and the magistrates—that is, the landlords—had the uncontrolled management of the poor-rates. As prices rose, the old scale of agricultural wages was maintained; it was not allowed to rise above the level on which a single man could live; and the remainder of what was considered sufficient to support a family, in the form of an eleemosynary grant proportioned to the number of children which composed it, was doled out by reluctant or liberal vestries, or ordered by humane magistrates exercising a cheap humanity. The amended poor law has cut off this resource by placing the management of the poor-rates in other hands, and preventing every payment that can approach in the remotest degree the form of relief in aid of wages. It would have been well for the farmers and landlords, as well as for all other classes, had they never possessed this resource. The pecuniary gain at the time was but little; it consisted only of the portion of the rates which the clergy and the non-agricultural rate-payers of the parish contributed to the payment of the farmers' labourers. The proportion which land then bore to other real property on which assessment is levied was greater than at present; for houses, railways, docks, canals, warehouses, have multiplied, while the area of the land remains stationary. Under the system of relief in aid of wages, the farmers and landlords of those days were, therefore, frequently only taking money out of one of their own pockets to put it into the other. If the farmer kept wages down, he paid increased poor's rates; and the landlord would have received higher rents for any lands which he might have to let, if the poor's rate had been lower. The evils which resulted from the system to the labouring class, and through them to the whole community, have been great and abiding; generations must pass away before they can be wholly removed.

It was then that the serfdom of the labourer commenced. It was then that he lost the spirit of independence, and learned to regard as his birthright that parochial relief which he had previously looked upon as a degradation. There were other causes which poured in their tributary streams of mischief; but this blending of wages and of eleemosynary relief was the fountain from which arose a large portion of that flood of pauperism and mendicity which has overspread the land and demoralised

its rural districts. But though the farmers of the present day have not the poor-rate to resort to, as the means of meeting the difficulties imposed on them by an enhanced value of labour, they have resources which were not possessed by the farmers at the beginning of the present century. What these resources are, how far the farmers have availed themselves of them, and how they may be made available to a greater extent, are questions which must be reserved for future discussion.

AGRICULTURAL BIOGRAPHY.

(Continued from page 48.)

CCCIII.—Batchelor, 1806.

Thomas Batchelor, farmer, wrote "General view of the agriculture of the county of Bedford; drawn up by order of the Board of Agriculture and internal Improvement;" London, 1806, 8vo., price 14s. in boards. This report fills 636 octavo pages, and is embellished with a map of the county, coloured in the different hundreds, and a portrait of Francis Duke of Bedford, known as the "farming duke." The contents of the work are well divided and arranged—geographical state; state of property; buildings; occupation; implements; enclosing; arable land; grass land; gardens and orchards; woods and plantations; wastes; improvements; live stock; rural economy; political economy; obstacles to improvement; miscellaneous articles; means of improvement; appendix. Under the head of arable land, the author treats very largely the crops of cultivation, in a number beyond the general notoriety; and under the head of improvements, the manures are handled in a very succinct and lucid manner. The implements exhibit all the useful tools, without any mixture of fancies or useless attachments, and the same may be said of the live stock. The author settles the point anent the working value of oxen and horses, by quoting the daily adoption of the latter animal in general practice. No better criterion of judgment can be got. Portraits are given of ploughs, harrows, and scarifiers, and of a farmer's dwelling-house in the shape of an octagon. The square form of buildings prevails over any other for convenience, as fewer corners are made by that shape than by any other fanciful formation. The outside walling is also more expensive, and the inside divisions are more in number. A diversity of form relieves the eye, but no advantage accompanies the deviation from the square shape of houses. The author is not a very strong advocate for leases of land, and thinks that yearly holdings create a familiar relation between landlord or tenant. But independence is lost; and without that inestimable privilege, a human being is merely a passive agent; a dependence converts the level familiarity into a sycophancy that is forced by the circumstances.

Nothing is known of this author beyond his name and professional employment, but he had evidently been a superior person, judicious, enlightened, and practical. Such persons are the decorators of any art.

The Bibliotheca Britannica ascribes to him "Village scenes and other poems," 1804, 8vo., price 4s. "An orthoëpical analysis of the English language, or an essay on the nature of its simple and combined sounds, the manner of their formation by the voice, organ, &c.; the whole illustrated and exemplified by the use of a new orthoëpical alphabet or universal character. Designed for the use of provincial schools;" 1809, 8vo., price 7s. The writer of such works must have been much beyond a common farmer, but no particulars are known.

CCCIV.—Clarke, 1806.

John Clarke wrote "An enquiry into the nature and value of landed and household property, reversionary interest in estates, and life annuities, with a variety of tables demonstrating the ratio of fines due on the renewal of leases of church, college, and other estates, and for the purchase and sale of leases of every denomination;" London, 8vo., 1806. This book is not found in the National Library, and it may not be reckoned an agricultural production; but it bears on the policy and connections of the art, and on that acconnt the name is included in the present biography. Loudon's list of authors does not mention the name, and the Bibliotheca Britannica is the authority of the use of the author and the book.

CCCV.—Carpenter, 1806.

J. Carpenter, Worcestershire, wrote "A treatise on practical and experimental agriculture;" Stourbridge, 1806, 2 vols., 8vo., price 21s. Neither the book nor the name of this author is found in the libraries of the British Museum; Loudon's list of authors does not contain the name, and the Bibliotheca Britannica is the sole authority for the above statement of publication.

CCCVI.—Smith, 1806.

Rev. Samuel Smith, minister of Borgue, wrote "General view of the agriculture of Galloway, com-

prehending two counties, viz., Kirkcudbright and Wigtonshire, with observations on the means of their improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement, with several plates;" London, 1806, 8vo. This work comprehends 388 octavo pages in the following divisions—geographical state and circumstances; state of property; progress and general plan of husbandry; buildings; occupancy; enclosing; implements; arable land; grass lands; gardens and orchards; woods and plantations; wastes; improvements; embankments; live stock; rural economy; political economy; obstacles to improvement; conclusion; appendix. The map of each county is coloured in the soils of gravel or hazelly loams, heath, alluvial or carse, sandy, green mountains. It would have been preferable to have had the colours in the true geological characters, as these counties mostly lie on the argillaceous schistus, very much mixed with primitive uprisings, but with no higher rocks. The soils are very varied in the quality. The author is very sensible on the lease of land, and adopts a long rather than a short tenure; paring and burning of all rough ground is strongly recommended, the objections against the process are examined and completely refuted from practice. The Galloway cattle, the female progenitors of the short-horn breed, are very fully described; the good qualities are amply noticed, the deficiencies pointed out, and the remedies suggested. It is the best dissertation on the Galloway cattle that has ever appeared. Sheep are few in these counties, at least the improved sorts.

This report has always been reputed in Scotland, as one of the best of the many county views that were published. The shrewdness of the author, his discretion and practical sense, are evident in every page. The writing of the county surveys had very much improved since the general mass of reports in 1794, the deficiencies had been noticed, and when a request was afterwards conveyed, some instructions were sent with a wish to the observance. A gradual alteration is visible from the first commencement, and every year added to the amelioration of the books that were compiled. At the time of which we write, agriculture had reached a high improvement, in many instances not exceeded by the present time, though half-a-century in advance, Education had been very widely diffused, without which no art or practice can be advanced, or support the forward movement. The ground-work of society in the social circumstances had been rapidly improving by reason of the great stirrings of the human mind over the civilized world; movements engendered demands which required supplies, and to furnish them fresh inventions appeared, which led to multiplied exertions.

CCCVII.—Potts, 1806.

Thomas Potts wrote "The British Farmer's Cyclopædia, or complete agricultural dictionary, including every science or subject dependent or connected with improved modern husbandry, with 42 engravings;" London, 1806, 4to., price 73s. 6d. This author had escaped Loudon's list of writers, and the above work is not found in the National Library; the Bibliotheca Britannica makes the above statement from the title page of the book, which has been seen among the stalls of second-hand works. It is a thick quarto, with a richly vignetted title-page, and otherwise ornamented. The materials are disposed alphabetically, and very concisely handled in every subject that occurs for description. It is a great improvement on the lengthy descriptions of preceding works, and must have been much valued at the time of its appearance. On many points, modern practice has not yet advanced beyond this cyclopædia of farming.

No record is found of the author's social life. The Bibliotheca Britannica ascribes to him "A compendious law dictionary," and "A gazetteer of England and Wales," which last work only is found in the National Library. The writer may not have been a practical farmer, but an amateur who engaged his attention towards the collection and arrangement of the practical knowledge of agriculture. He added a large mite to the progress of the art.

CCCVIII.—Pearson, 1806.

George Pearson, M.D., F.R.S., senior physician to St. George's Hospital, lecturer on chemistry and on the theory and practice of medicine in London, wrote "Experiments and observations on the constituent parts of the potato root;" London, 1806, 8vo. "A communication to the Board of Agriculture on the use of green vitriol or sulphate of iron as a manure, and on the efficacy of paring and burning depending partly on oxide of iron;" Nicholson's Journal, vol. x., 1805. The first work is an essay of 10 quarto pages, containing 10 experiments on the composition of the potato, done by the desire of the Board of Agriculture, in which the well known contents were discovered. The author recommends the potato as food, on the grounds which are long ago known. The second work contains 13 octavo pages, wholly relating to salts of iron being converted into manures by the processes of cultivation, and by artificial preparation. The contents are mostly in letters addressed to the author from the country, where trials had been made with ashes of peat, coal, and vegetables. Ashes of all kinds are a well authenticated manure, and the quality will differ widely according to the natural constitution of the substances from which they are

obtained. But generally speaking, the action of fire converts most substances into a fertilizing element, varying by reason of the constitutional matters.

CCCIX.—Lister, 1806.

W. Lister, farmer and engineer, wrote "Observations on the utility of cutting hay and straw, and bruising corn for feeding animals, elucidated by agricultural practice; with a description of the best machines for that purpose. Also a new discovery of the utmost importance to the agricultural world, by which may be separated the more nutritious sorts of straw for feeding animals from the refuse to be used as litter, with cuts;" 1806, 8vo. "A history of British implements and machinery applicable to agriculture, with observations on their improvement;" 1811, 4to., price 31s. 6d. None of these works nor the author's name are found in the National Library, and they are not mentioned in Loudon's list of authors. Though pompous announcements are generally found to be wanting, and lead to disappointment, yet curiosity is ever alive to discover anything that is promised, and continues after repeated misgivings in search. The author's new discovery of using straw may not have amounted to much worth, and the bare statement may have been the whole value, still eagerness grasps at promises, and seizes the shadow when the substance never comes. In the present case nothing can be said of this author, and the authority rests with the Bibliotheca Britannica.

CCCX.—Scott, 1806.

—— Scott wrote "Essay on the whole process of cultivating rape and cole seed on various soils, with plates;" 8vo., price 10s. 6d. This work does not anywhere occur except being advertised by a bookseller.

CCCXI.—Serle, 1806.

—— Serle wrote "On the management of landed property, as far as respects manor farms, mills, and timber;" 8vo., price 2s. 6d. No notice is found of this work except in a bookseller's advertisement.

CCCXII.—Ainslie, 1806.

John Ainslie, Engineer, wrote "Tables for computing the weight of hay, cattle, &c., by measurement;" London, 1806, 12mo., price 1s. 6d. "Treatise on land surveying, including a treatise on the theory, plates;" Edinburgh, 1812, 4to., 26s. The National Library contains only the book on land surveying, which has always been much esteemed and has been reprinted. The tables of measurement have had a very large circulation, and have never been surpassed by the many succeeding forms of estimating the weight of cattle by measurement. The last-mentioned work has had but a slender appearance.

CCCXIII.—Holland, 1807.

Henry Holland, M.D., honorary member of the Geological Society, an eminent London physician, wrote "General view of the agriculture of Cheshire, drawn up for the Board of Agriculture;" London, 1807, 8vo., price 10s. "A sketch of the natural history of the Cheshire rock-salt district." Geol. Trans. i. 38. The report of Cheshire is an octavo volume of 375 pages, containing—geographical state; state of property; buildings; mode of occupation; implements; enclosing, gates, and fences; arable land; grass; gardens and orchards; improvements; live stock; rural economy; political economy; obstacles to improvement; miscellaneous observations; conclusion; means of improvement; appendix, Nos. i., ii., iii. The maps are—of the county, coloured in hundreds; of the minerals of Cheshire; section of the strata over the salt beds; of farm buildings; and of the roofing of the rock salt pit. The view of the county is written throughout with much ability and dispassionate judgment, the author combating most successfully the prejudice against paring and burning, and also against threshing machinery. The description of the salt mines and the working of the rocks is most interesting to the geological amateur and instructive to the general reader. The appendix is most valuable, in three articles—on the nature and origin of marl; on the origin of rock salt; on the use of sea mud as a manure. This report must have a high place among the county surveys.

CCCXIV.—Headrick, 1807.

Rev. James Headrick, minister of Dunichen, wrote "General view of the agriculture of the county of Angus or Forfarshire, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1807, 8vo., price 18s. The author was an excellent chemist, a good naturalist, and an agricultural philosopher. He wrote a large work "On the mineralogy, agriculture, manufactures, and fisheries of the Isle of Arran," which has enjoyed much repute. The survey of Angus-shire is an octavo volume of 590 pages, with an appendix containing 120 pages of closely printed small type. A map of the county is coloured in the distinctions of lakes or waters, carse clay, moor and mountain pasturage, soils chiefly alluvial or formed from decomposed whinstone, retentive subsoils, sandy downs or links, where the sand is generally blown into hills. The contents are in the following divisions—geographical state and circumstances; state of property; buildings; towns

and villages; mode of occupation; implements and machinery; inclosures; arable lands; grass; gardens and orchards; woods and plantations; wastes; improvements; live stock; rural economy; political economy; miscellaneous observations; conclusion. The appendix contains eleven communications on various subjects, in the shape of letters, and of very useful information.

This is by far the most scientific of the reports of the Scotch counties, and it shows a knowledge of practice that is very corresponding to the more elevated performance. The geological mineralogy of the county is most interesting, as it forms a descent from the primitive Grampians to the old red sandstone which faces the waves of the ocean. The intermediate graduations are most amply described by the author, and the soils recumbent on the rocky beds from the granite to the sandstone. The author had collected a mass of the soundest information, and of the most correct practice; and on all doubtful points, as paring and burning lands and smut in wheat, he expresses his opinion with much discretion and becoming diffidence. The whole book shows a very superior mind, that was learned but not pedantic, and enlightened but not dogmatic. A long introduction and a lengthy appendix rather deface the work; but it was the fashion of the day, and the best writers had not surmounted the custom.

Our notice of writers now becomes more lengthy and minute, as the approach to present times has been made pretty near, and the circumstances are assimilated by which the social order was governed. The examination must be more close, and the enquiry more keen; and the opinion has to be equally comprehensive and discriminating. The extent of our subject dispels all literary vassalage; no obligation is due for favours conferred, no debt is owing for services that may be real or supposed, and no fealty remains unpaid. Hence our opinion is free and unfettered, bound by no ties, and manacled by no obligation. A single biography is ever a literary vassalship, undertaken to repay obligations and to extinguish the debt of favours bestowed. No freedom exists; but every idea must be praise and every line an echo of merit, whether it was real or accidental. Our biography is rid of this hindrance, and its removal shall be inviolate.

CCCXV.—Rudge, 1807.

Rev. Thomas Rudge, B.D., wrote "General view of the agriculture of the county of Gloucester, drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1807, 8vo., price 9s. The work fills 408 octavo pages, and is embellished with a finely coloured map, distinguishing the different soils as they are found over the county. A map is given of canal navigation through the county, of some cottages and implements, and of drainage done by a wheel. The contents are—geographical state and circumstances; state of property; buildings; mode of occupation; implements; enclosing, fences, and gates; arable land; grass; gardens and orchards; woods and plantations; wastes; improvements; live stock; rural economy; political economy; obstacles to improvements; miscellaneous observations; means of improvement; appendix. Irrigation and the dairy are well treated in this report, as these articles are very prevalent in Gloucestershire; other subjects are very short in the description, as swine and horses, while the cattle and sheep receive a very proper allotment. The author wholly discards an introduction, and the appendix is curtailed to 26 pages. The work is a very respectable performance.

CCCXVI.—Renton, 1807.

George Renton, a Berwickshire farmer, wrote "The grazier's ready reckoner, or a useful guide for buying and selling cattle, being a complete set of tables, distinctly pointing out the weight of black cattle, sheep, or swine, from three to one hundred and thirty stones, by measurement; together with directions showing the particular parts where cattle are to be measured;" Berwick, 12mo., 1807, price 2s. 6d. The first edition appeared in 1801. These tables occupy 37 duodecimo pages, and are in columns of girth, length, weight. The correctness of the author's idea has never been disputed, and the accuracy of the tables has been well established.

CCCXVII.—Rennie, 1807.

Rev. Robert Rennie, D.D., F.A.S., Edinburgh, minister of Kilsyth, in the county of Stirling, wrote "Essays on the natural history and origin of peat moss, the peculiar qualities of that substance, the means of improving it as a soil, the methods of converting it into a manure, and other economical purposes to which it may be made subservient;" Edinburgh, 1807, 8vo., price 5s. The essays are nine in number, on ligneous plants; aquatic plants; the changes and combinations by which vegetable matter is converted into moss; the simple and compound substances that may be expected and are really found in peat moss; the alliance between peat, coal, and jet; the alliance between peat and other bituminous substances; on the distinguishing qualities of peat moss; on the sterility of moss in its natural state, and causes of it; on the different kinds and classification of peat moss. This work forms a thick octavo volume of 657 octavo pages, which contain a deep research and a most elaborate discussion on the subject of peat moss. There may not be doubted the opinions

of its formation and the statement of its qualities; but on the subject of the cultivation of peat, there remains to be repeated the opinion that was expressed in the notice of the work of Mr. Aiton, "that moss, stricly so called, is beyond the reach of any cultivation; that the improvements that are related to have been performed, have been done on mossy earths that rest on a substratum near to the top, and capable of supporting the processes of culture; and that mossy substances are generally placed in latitudes too high to mature the fruits of utility." Rennie's work has much merit, but no result can follow in the way of cultivation.

CCCXVIII.—Robertson, 1808.

Henry Robertson, M.D., wrote "General view of the atmosphere, and its connection with the science of medicine and agriculture;" Edinburgh, 2 vols., 8vo., 1808, price 21s. "Description of a churn;" Thom. Annals of Philos., i, 451, 1813. The first work fills 406 octavo pages, and forms a most scientific and entertaining history of the atmosphere and its variations. The notices of heat and light are highly interesting, as are the articles on climate and vegetation. The work is far the best that has appeared on these points of agricultural connection. The language is simple, and open to any comprehension.

CCCXIX.—Barber, 1808.

William Barber, a London architect, wrote "Farm buildings, or rural economy—containing designs for cottages, farm houses, lodges, farmyards, &c., with appropriate scenery to each, 6 plates;" London, 4to., 1808, price 10s. 6d. "A description of the mode of building in Pisé;" 1808, 4to. The works of this author are not found in the National Library, but are mentioned as above in the Bibliotheca Britannica, and in Loudon's list of authors. The want of the farm designs may not be a great loss, six plates could not contain many plans; and architects have evershown a great deficiency in designing the accommodations of a farm, however skilful their art may be in the erection of walls and in forming doors and windows. An enlightened practice only is capable of promoting agriculture, and all similar arts that are mixed in their nature and varied in their performance. It has its own philosophy, and a peculiar adaptation.

CCCXX.—Watson, 1808.

Richard Watson, D.D. and F.R.S., was born in 1737, at Heversham, near Kendal, in Westmoreland, where his father, who was the younger son of a small landowner, had kept a grammar school since 1698. Our author was the youngest son, and received under his father's successor an education that was barely equal to the common grammatical learning of the day. He was sent to Cambridge on an exhibition, and at that university he fought his way, by means of hard work and hard living, to the successive academical degrees and honours, and in 1764 he was elected Professor of Chemistry. In 1771 he was appointed Regius Professor of Divinity, and owed it, as well as his former appointment, to his indefatigable industry and the general opinion of his character. He was appointed to several church livings, and in 1782 he was made Bishop of Llandaff. He wrote many pamphlets, charges, and sermons on church matters, which showed his powerful intellect and original powers of mind. He spent the latter years of his life in retirement on his estate of Calgarth Park, in Westmoreland, which he amused himself in ornamenting and improving by building and planting. He died there in 1819.

In 1815, Watson published two octavo volumes under the title of "Miscellaneous tracts on religious, political, and agricultural subjects." In 1808, he communicated to the Board of Agriculture, "On planting and waste lands," and "Chemical essays," in several editions from 1757 to 1796. His other works are many in number. The chemical essays have always been reckoned cognate to agriculture by the manner in which the earths are treated, and also calcareous substances. The language is most peculiarly simple and easily understood. The communication on waste lands and planting is a strong recommendation, to improve all hilly waste grounds by making plantations of larch trees. The reasoning is very just, the proofs strong, and no doubt were fully evinced on the hills of Westmoreland and under a hyperborean climate. In all such situations, the question does not admit any doubt.

The Bishop of Llandaff possessed a vigorous intellect, and a very uncommon comprehensive grasp of mind. His agricultural notices are few and scarcely tangible; but his character is well known in connection with church government, Gibbon, and Paine.

CCCXXI.—Hood, 1808.

Thomas Sutton Hood, Esq., wrote "A treatise on gypsum, on its various uses, and its application as a manure;" 1808, 8vo., price 1s. 6d. The National Library does not possess this work, the above statement comes from the Bibliotheca Britannica and Loudon's list of writers. This author has been sometimes called "Sutton Thomas Wood."

CCCXXII.—Curwen, 1808.

John Christian Curwen, Esq., M.P., of Workington Hall, Cumberland, wrote "Hints on agricultural subjects, and on the best means of improving the

condition of the labouring classes;" London, 8vo., 1808. "A tour in Ireland;" 2 vols., 8vo., 1819. The first work is a volume of 373 octavo pages, which treat four subjects—on steaming potatoes as a substitute for hay in feeding horses; on the means of supplying milk for the poor; on soiling cattle; and general hints on farming. An appendix is added on friendly societies. With regard to the substitution of potatoes for hay, the watery consistence of the root at once forbids the serious entertainment, though experience has shown the great value of the potato in being given as an additional meal to the working animals. Raw or steamed, the use is very beneficial in this way, both of the potato and the Swedish turnip. But as an entire substitute for either hay or corn, the authority must be doubted. The best means of supplying milk to the poor, is to give the article in part of wages, as is done in the border counties of Great Britain, by the keep of a cow throughout the year. To provide any articles for sale is wholly nugatory, unless the labouring population have money to buy them. The soiling of cattle seems less problematical; horses and cattle are very advantageously fed with cut food, in houses and yards, from lands that produce the crops to be mown; with sheep, and in the case of inferior lands, the matter is questionable where the crops to be used are not produced. The lands may be grazed, but not mown. The general hints on farming contain many good suggestions conveyed in a desultory manner. The appendix on friendly societies embodies a very friendly feeling.

The tour in Ireland fills two volumes, of 435 and 355 octavo pages each, written in a very plain and sensible way, and describing what had been done and what might still be performed. This tale is the cuckoo song of every visitor to Ireland, and in the midst of them the state of the country but slowly progresses.

Mr. Curwen's practical farming may have been fanciful and probably chimerical, and it advanced beyond sound theory, from want of practical experience on which to build a superstructure. But his writings do everywhere exhibit a very energetic activity of mind, an enlarged comprehension, and a most philanthropic benevolence. His reasoning is most just on the granting of leases of land; the proprietor gets his lands improved by other persons by granting the necessary security, just as the owners of building land get houses built on the grounds by other persons, by granting the necessary length of lease. In time the house comes to the owner of the land, and so do the improvements of land at the end of the lease.

CCCXXIII.—Beddoes, 1808.

Thomas Beddoes, M.D., born in Shropshire in 1760, died in 1808 at Bristol, where he practised as physician. He wrote "Good advice to husbandmen in harvest, and for all those who labour in hot berths, and for others who will take it in warm weather;" 1808, 8vo. "On the means of foretelling the character of the summer season, and the benefits to be expected from the cultivation of grasses which vegetate at low temperatures;" Nich. Journal, 1802. Neither of these works is found in the National Library, which possesses some medical works of the author, who enjoyed a very high professional reputation. The list of his books fills a column of the Bibliotheca Britannica.

CCCXXIV.—Bakewell, 1808.

Robert Bakewell, Esq., an eminent geologist and minoralogist, wrote "Influence of the soil and climate on wool, with an easy method of improving the quality of English clothing wool, and hints for the management of sheep, &c., with occasional notes and remarks by the Right Hon. Lord Somerville;" London, 1808, 8vo., price 6s. 6d. The author wrote several papers on geology and mineralogy, which appeared in the Transact. of the Geological Society, and the Philoso. Magazine. The book on wool forms an octavo volume of 157 pages, stating a very enlarged comprehension on the subject it embraces, and much practical knowledge of every management of sheep and wool. The author had been much engaged in the dealings of wool, and had made very acute and accurate observations on every point which came under his inspection. He shows the effect of the different treatments of the animal both on the quantity and quality of wool, and the recommendations given are marked by much discrimination and sober reflection. Notes are added by Lord Somerville, who is well known to have paid much attention to the article, and made it the chief subject of attention for many years. From these works, the practical man may derive many hints and suggestions that are applicable to practice, and to become most useful details.

CCCXXV.—Grahame, 1809.

James Grahame, advocate, and afterwards curate of Sedgefield, see of Durham, wrote "British Georgics;" London, 1809, 12mo. The author wrote several poems and historical dramas, and was a person of some distinction. The book in question is a duodecimo volume of 312 pages, describing in blank verse the works, customs, manners, and employments of the year in the twelve months of calendar division. It does not exhibit any particular system of husbandry; it amuses rather than instructs, and recommends the study of a science rather than teaching of it. The work embraces a mixed description, and is lavish on rural modes and

manners; the poetry is both lame and tame, and never rises beyond a feebleness of conception, and a descriptive halt. The portion of practical knowledge is very minute, with incidental notices of the new introductions. The notes added to each month of the year are curious and valuable to the amateur of fire-side tales and cottage stories. The book had gone into two editions, one in London, another in Edinburgh; but it had never reached any public notice, or had met with moderate approbation. The fancy of Thomson is required to enliven the dull and tiresome monotony of description, even if it be the theme of silly aspirations and low occupations.

CCCXXVI.—Tibbs, 1809.

Thomas Tibbs, farmer, wrote "The Experimental Farmer;" 1809, 8vo., price 6s. This book is not found in the National Library; the above statement is found in the Bibliotheca Britannica, and in Loudon's list of authors. Such a work as the former could not well give the authority of its insertions; but the private compilation of individuals might very conveniently satisfy the public, as to whence the information was drawn that led to the use of the name of an author. Our list gives this name on the two authorities above-mentioned, though not sanctioned by the National Library. Extensive as is the collection of that repository of books, yet *every* work that has been published is not found in it. And notwithstanding the very special enactment of the Copy-right Act, a copy of each book that is now published is not sent to its archives. The neglect is very injurious, as books get out of print and are lost in remembrance. Many agricultural works have been lost in that way, and stalls and private libraries occasionally show books that are not found in the National Libraries, owing to a copy not having been lodged there by the first issue.

CCCXXVII.—Wagstaffe, 1809.

Mr. Wagstaffe wrote "On reclaiming waste land;" Nicholson's Journal, xxiii., 95, 1809. This essay occupies but three octavo pages in the form of a letter, dated by the author from Norwich. There is detailed the mode of improving some waste lands of a peculiar nature and position, which was done by opening ditches, and plantings of willow and ozier. The essay scarcely deserves the notice of agriculture, and is accompanied with similar communications in the same journal on the subject which it treats. Waste lands, being differently situated, require varied applications to bring them into cultivated use.

CCCXXVIII.—Wade, 1809.

Walter Wade, Esq., M.L.S., wrote "Lectures on the meadow and pasture grasses, at the Dublin Society's Botanical Garden; and the artificial and sown grasses, as lucerne, sainfoin, clovers, trefoils, vetches, &c. These lectures occupy 106 octavo pages, and possess much merit. The scientific and classified distinctions of the plants are most accurately stated, and the natural properties given. The cultivated value of each plant is most correctly detailed, and seems to have been obtained from the best authorities on the subject. The writer seems to be unknown in the scientific and practical world; his writings are confined to the essays now mentioned, which are very sufficient to place his name in at least the second niche of the temple of agricultural fame.

The author was an educated person; a physician, and professor of botany to the Royal College of Surgeons in Dublin, and member of several societies. In the present case, the scientific botany is accompanied with the practice necessary to make it acceptable to general use, and to induce the examination of the productions. Vulgar minds recoil from scientific dryness, which explains no object, and imparts no better performance. When both qualities are joined, the merits of the work are inestimable.

CCCXXIX.—Meyrick, 1809.

Samuel Rush Meyrick, LL.D., of Queen's College, Oxford, wrote "The history and antiquities of the county of Cardigan, with the mineralogical and agricultural state of the country;" London, 8vo., 1809, price 4s. The book is a quarto volume of nearly 600 pages, embellished with many engravings and printed memorials. It seems a very comprehensive history, and embraces everything that can possibly occur to the observation when contemplating a country to be described. The agricultural improvements are related, the wants pointed out, and the adoptions suggested. The work has enjoyed much notice.

CCCXXX.—Sebright, 1809.

Sir John Saunders Sebright, Bart., M.P. for Hertfordshire, wrote "The art of improving the breeds of domestic animals;" London, 1809, 8vo., price 2s. 6d. The book is an octavo of 31 pages, in form of a letter addressed to Sir Joseph Banks. The ideas on this very important point are the same with the most enlightened opinion of the present time; the author condemns breeding in-and-in, and recommends the adoption of sexual intercourse with much judgment and becoming diffidence. If the author had not practised, he had done much more; he had framed in his mind an ideal performance, which is often more correct than any process that can be done. Being committed to paper, it leads to advancement.

CCCXXXI.—Coventry, 1809.

Andrew Coventry, M.D., was professor of agriculture in the University of Edinburgh. He was a learned, ingenious, and benevolent man; cultivated his own estate in Kinross-shire, and was extensively employed as a land valuer, and rural counseller. He died in 1830.

Dr. Coventry wrote "Discourse explanatory of the nature and plan of a course of lectures on agriculture and rural economy;" Edinburgh, 8vo. "Observations on live stock, in a letter to Henry Clive, Esq.;" Edinburgh, 8vo. "Notes on the culture and cropping of arable land;" Edinburgh, 1812, 8vo. The professional life of the author was distinguished by much sound information, and a very discreet judgment.

CCCXXXII.—Stevenson, 1809.

W. Stevenson, Esq., M.A., wrote "General view of the agriculture of the county of Surrey;" London, 8vo., 1809. Mr. Loudon calls this person—librarian to the Treasury, author of various works, and a writer in the principal encyclopædias, and states his death in 1829.

The Bibliotheca Britannica attributes the above work to two persons, W. Stevenson and William Stephenson, land surveyor, who also wrote "A system of land surveying in 1805." The King's Library in the British Museum gives to William Stevenson, land surveyor, "The agricultural report of Surrey," and also "of the county of Dorset in 1812, which last work is not mentioned in any list of authors or books. The different spelling of the name may have caused some confusion; our list gives the authorities, and looks to the author in the two reports of Surrey and Dorset.

The author writes his name "William Stevenson" without any appendage, so that the uncertainty remains if he be the librarian of the Treasury, or the land surveyor. There is no dedication or preface, from which some information might be gleaned of the identity of the person. The survey of Surrey is an octavo volume of 607 pages, with a map of the county, coloured in the different soils of calcareous loam, sandy loam, strong loam, clay of the weald, black land; the chalk hills are not coloured. All the details of common agriculture are very lucidly and concisely related, and also the peculiarities of the county which is described, of which the short leases are very justly reprobated as an obstacle to improvements. The survey is a very creditable performance, and practical beyond scientific.

The report of the county of Dorset is a volume of 487 octavo pages, with a map of the shire coloured in the soils of clay, sand, chalk, and strong chalk. In a short preface, the author states that the most part of the materials was compiled by Mr. Bachelor in 1810, and afterwards consigned to him in order to make additions to be the more complete. The date is at Chelsea, in 1812. The work is more varied than the report of Surrey, and contains a greater quantity of matter more densely expressed. The appendix contains a valuable paper on the geology of Dorsetshire, which is very interesting from the intermingling of chalk and clay in very varied modifications, the oolite limestone and Kimmeridge coal. Both reports show a very superior professional information and judgment.

CCCXXXIII.—Dutton, 1809.

Hely Dutton, Esq., landscape gardener, wrote "Statistical and agricultural surveys of the counties of Clare and Galway;" Dublin, 1809 and 1814, 8vo., drawn up by direction of the Dublin Society. The condition and usages of these remote and benighted parts of Ireland are very sensibly delineated by the author, who seems to have well known the statistics and circumstances which required the representation.

CCCXXXIV.—Farish, 1809.

John Farish, Dumfries, wrote "A treatise on fiorin grass, with a short description of its nature and properties; together with the soils and manures best adapted to its culture, and the advantages to be derived from this valuable grass;" 1809, 8vo., price 2s. The National Library does not contain this work: the authority rests with the Bibliotheca Britannica and Loudon's list of authors. No other work is attributed to this author, whose ideas of practice on the subject of fiorin grass might probably have been worth being examined and recorded. They had not upheld the use of the plant.

CCCXXXV.—Mackenzie, 1809.

Sir George Stewart Mackenzie, Bart., F.R.SS., London and Edinburgh, wrote "A treatise on the diseases and management of sheep, with introductory remarks on their anatomical structure; and an appendix containing documents exhibiting the value of the Merino breed of sheep, and their progress in Scotland:" London, 1809, 8vo., price 7s. 6d. "General view of the agriculture of the counties of Ross and Cromarty, drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1813, 8vo., price 9s. This last work had escaped the notice of the Bibliotheca Britannica; it is an octavo volume of 353 pages, in 15 chapters of useful divisions. The climate, soil, and productions of these northern counties are well described, with the means and obstacles of improvement. The map of the counties is a meagre production, plain, with lines and skirted edges.

The treatise on sheep fills 180 pages, and displays

much skill in the objects of description. The author was a scientific gentleman of very considerable notoriety, who wrote on several subjects of an elevated nature, in all which his knowledge and spirit were very commendable. He had imbibed the mania of the Spanish sheep, and thought to overturn what nature has ordained; the animal could not be fattened in this country with the profit and advantage of the native breeds, and this deficiency soon settled the point in a country, as England, of flesh-eating notoriety.

CCCXXXVI.—Sugar, 1809.

"The use of sugar in feeding cattle" was published in 1809, by John Harding, St. James-street. The author is not known; the dedication is to Sir John Sinclair. Experiments are quoted of bullocks fattened with molasses, which were rewarded with a prize. The author's ideas are no romance or chimera, but a very feasible entertainment of the undertaking, when a social revolution permits the fruits of all climes to be used in freedom of the burden of value that is imposed by monopoly, and restricts the legitimate appropriation. Sugar is diffused in nature, almost beyond any other article of composition, and thence may be gathered the value of its quality. The book fills 120 pages octavo, of very sound writing.

CCCXXXVII.—Bowden, 1809.

Thomas Bowden wrote "The Farmer's Director, or compendium of English husbandry;" 8vo., price 2s. A bookseller's advertisement only gives the notice of this work; it is not found in the Bibliotheca Britannica, nor in the National Library.

EXPERIMENTS ON TOP-DRESSING CEREAL CROPS.

There are those amongst agriculturists who most decidedly object to top-dressings of manure to cereal crops. They contend it is wasteful, and of doubtful advantage—wasteful in a dry season because of the evaporation and volatilization of the best parts of the manure applied, wasteful in a wet season from the incessant washing to which the manure is exposed; and of doubtful advantage in any case but when the crop requires a medicine. Everyone knows that a piece of wheat or barley sometimes turns unexpectedly yellow, either the season has not suited the soil or the crop, or the thousand-and-one other malign influences are too much for the plant's vitality, and it is dying off. An application of nitrate of soda, or guano, or some similar top-dressing, will save the crop.

Or take a case where the soil is unexpectedly found too poor to carry on successfully a crop which it was anticipated it would mature to perfection. The plant shows symptoms of feebleness and poverty—a top-dressing of manure will not unfrequently turn the balance in its favour.

So much for extraordinary cases. They are diseases, so to speak, where the top-dressing is the only dressing which can be given, and where, as a prescription rather than an aliment, it is submitted to of necessity. All admit, without difficulty or exception, that this is a most valuable application. But may they not be extended with advantage? Is it not true that almost all manures have a great tendency to wash downwards? Will not lime, for instance, escape downwards, despite every effort? and will not ammonia, and phosphoric acid, and other applications on which we so much pride ourselves, escape through the soil, especially if an excess of sand exist in it, almost beyond calculation or conception? And surely, then, it seems to follow, without either straining of theory or possibility of mistake, that the nearer the surface, in most cases, a manure is applied, the better will it be for the land.

And what real *loss* takes place, after all, by exposure on the surface? That there is some, we admit. So there is, and far greater, in the fermentation of fresh dung; and yet we are not prepared to venture for one moment to doubt that this is not only advantageous, but absolutely necessary. Doubtless the presence of so large a quantity of oxygen—the exposure of the vast surface to the action of the atmosphere—will carbonize and volatilize some of the ammoniacal matter which otherwise might have been in a state of fixation, and so be lost; but we hesitate not to say that by far the greatest loss sustained is *moisture*—mere water. We have seen results too favourable from the top-dressing of corn land with farmyard manure on light soils, to admit of a doubt that it is a most valuable process, and that if there is much loss, the comparative energy of that retained is greater, or exercised in a more important degree.

By the systematic experiment of Mr. Alexander Main, to which the Highland and Agricultural Society of Scotland, with more liberality than it has of late exercised to some experimentalists, gave the premium of twenty sovereigns, we have a great deal of light thrown on the principles and rationale of top-dressings to cereals, both in a vegetative and economical sense. As regards the degree, the time,

the mode, as well as the very principle of application, the experiments were particularly valuable.

The first was on the barley crop of 1849. The manure applied was saltpetre refuse; and this at the rate of two hundred-weight and forty-four pounds per acre on different portions of land, part of each being reserved without manure, to more accurately measure the results.

The first experiment was on the 2nd of June, which increased the produce from 4 qrs. 7 bush. and 3 pecks to 6 qrs. 6 bush. per acre, showing a gain on the application of £1 6s. 8½d.

The second, when 184lbs. were applied at the above-mentioned date, and 84lbs. on the 27th of June, increasing the produce from 4 qrs. 3 bush. to 6 qrs. 2 bush. per acre, being a gain on the application of £1 9s. 10½d.

The third experiment had the manure equally divided, the one half applied at the first-named period, and the other half on the 13th, eleven days afterwards; and this increased the produce from 4 qrs. 3 bush. and 3 pecks to 7 qrs. 1 bush. and 2 pecks per acre, and was a gain of £2 6s. 4½d.

The fourth and last experiment on the barley was made, by dividing the manure into nearly three equal parts, the first 89lbs. applied on the 2nd of June, the next 89lbs. on the 13th, and the last or 90lbs. on the 27th. This increased the grain from 4 qrs. and 4 bush. per acre to 5 qrs. 7 bush. and 2 pecks, and showed a gain from the application of 19s. 8d.

There was, therefore, both the greatest increase of grain and the greatest advantage in a pecuniary sense, from the equal division of the manure applied at intervals of some eleven days; as if the crops required a repeated application rather than the whole at once—possibly because the plants could appropriate one half of the quantity when they could not the whole, but were able to take in the other at a later period. Or it might be that from the non-appropriation at first, there had been some subsequent waste of the material when the wants of the crop were less fully supplied. This, at any rate, seems to have been the case on a comparison of the first and third experiments, for the grain was increased almost as much more per acre in the latter case as in the former, and so the monetary results were almost double in the latter case.

There is this modification, however, in the case, which must not be forgotten: We all know the advantage of vigorous growth in the early stages of a plant. The foundation is thus laid for future and vigorous development which it never loses, and seems by this to possess far more powers of appropriation than it could do otherwise. Hence, we think some of the applications were too late to be of real service. Those on the 27th of June we should imagine to be far too late in the season to be productive of the same amount of good they would have effected at an earlier period, and the weather, especially in a manure like saltpetre refuse, which would lose little by volatilization, and require solution, must have a very material influence.

But we think it will hold good in all the experiments we have seen, that the poorer the land the greater the result of the dressing. This will apply to all kinds of manure, but more especially to any description applied to the surface. Thus the land in the second and third experiments was the poorest; not that there was any great difference in its productive power, but it had the advantage – in other words, the *top-dressing did the greatest amount of good where it was the most required.*

The question of the feasibility of top-dressing crops is incidentally illustrated by the recent experiments of M. Ville, of Paris, on the influence of ammoniacal preparations on plants. Long ago, Sir Humphrey Davy showed how the vapour of manure stimulated the growth of a sod of turf, insulated and exposed to the influence of the volatilized contents of the manure-heap; and he hence inferred it to be better not to ferment the manure. But he attributed the result mainly to the carbonic acid gas generated in the decay of the manure during the fermentative process. The researches of M. Ville, however, seem to place the scientific fact on its proper basis, and show that it is to the ammoniacal vapour that the result is mainly due. In a recent paper—read, indeed, a fortnight ago before the English Royal Society — he showed the most surprising experimental results from the greatest dilution of the gas. In the almost infinitesimal proportion of four ten-thousandths, a very marked difference was observable, in seven or eight days, in the character of the plants under its influence; which improvement went on increasing for some time. Applications like this, of which top-dressing is the most familiar agricultural type, act and re-act upon each other: they first stimulate to the production of large capillary vessels, and thus they give the means for the plant appropriating more of the other food it requires from the atmosphere and the soil.

The special effect of the ammoniacal gas M. Ville observed to be, that the leaves which, when his experiment commenced, were of a pale green, began to assume a deeper and deeper tint, until at length they became so dark as for a time to appear almost black. Their petals also became long and upright, and their surface broadly developed, and had a peculiar shining appearance. The experimental plants matured well—were far superior to the same crop to which no ammoniacal gas had been applied, and, weight for weight, con-

tained *double the quantity of nitrogenous matter.* But there are several modifications to this result, arising from the *time of its application.* If its use is commenced long before the flowering season of the plant, it may be used with impunity and advantage—no disturbance of the plant takes place; but if its use is commenced at or near the time of flowering, this function is arrested, or, at any rate, delayed. The plant begins to develop leaves, instead of flowers; and if the flowering takes place at all, the flowers are unfruitful, showing that the power of modification is possessed by the cultivator in a degree little understood.

We before intimated that to apply top-dressings, generally ammoniacal preparations, at a mature stage of the plant, seems at least to be of very little use; and it is possible it might do considerable damage. But the application to wheat seems to be subject to modifications not adapted to the barley, partly because the wheat is much longer in arriving at maturity, and partly because of the different appropriating power of the plant.

Mr. Alexander J. Main, to whose experiments on barley top-dressing we have already alluded, made experiments also on top-dressing wheat, but applied a more definite manure than saltpetre refuse —the sulphate of ammonia, at the rate of 2 cwt. per acre, in the three following modes, and with the results, as against no application, indicated below:

In his first experiment he applied the whole of the sulphate of ammonia, on the 18th of May, at one application, and shewed a produce of 6 qrs. 7 bushels per acre, against 4 qrs. 1 bush. 3 pecks where there was no application.

In the second experiment the manure was divided into equal parts; the first part applied on the 18th of May, and the other on the 30th of the same month: the result of the application being 6 qrs. 6 bush. 2 pecks, against 5 qrs. 7 bush. 3 pecks where there was no manure applied.

In the third experiment 74lbs. of the sulphate was applied at the same time as the first experiment (the 18th of May), 74lbs. on the 30th, and 76lbs. on the 9th of June; and the result was a produce of 7 qrs. 4 bush., against 4 qrs. 6 bush. 3 pecks where there had been no top-dressing applied.

At first sight there would seem to be an entirely different result from the application of top-dressing to barley. In the case of the wheat, the more the application was divided the greater the result; in the case of the barley, the more division the less result. But it must be borne in mind that the relative periods as regards *flowering*—the very principle laid down in the experimental researches of M. Ville—were most favourable to the wheat.

The first application, it will be remembered, made to the barley was on the 2nd of June, the last on the 27th. Now the last date must have been a period when the flowering would either have commenced, or be very near indeed; whereas the wheat had a much more favourable period of application —the first commencing on the 18th of May, the last taking place on the 9th of June. It had therefore a far better relative top-dressing than the barley.

Nitrate of soda was also applied by the same gentleman to wheat, in the same quantities and proportions and at the same period; and it seems that the greatest excess of crop was again produced by the small division of nitrogenized manure, as with the ammoniacal preparation.

He also further applied equal quantities of sulphate of ammonia and nitrate of soda in the same manner to wheat, and with nearly the same result; a difference of a bushel per acre only being below the other, which might easily occur in any experiment whatever.

The greatest gain per acre, however, was by the application of nitrate of soda, divided in the manner we indicated into three divisions, showing a balance in favour of the experiment of the large sum of £7 14s. 9½d. But the natural produce of the soil was amongst the lowest in this case, showing, in fact, the necessity of some application; and, as we before stated, the greatest results are produced where the realized produce of the land is the least; in short, where the necessity of some food is the most apparent. We do not think these experiments show any discouragements to top-dressings, but quite the reverse.

RIVER DRAINAGE TO REMOVE FLOODS: A PROBLEM FOR PARLIAMENT.

Whole valleys under water in seed-time, and crops comprising the yearly toil and capital of the farmer swept away in harvest, offer but one subject for discussion—the imperfect river drainage of the country. During the last winter and spring, the scenes which the valleys of our large rivers—such as the Ouse, Nene, Trent, &c.—presented, had more the character of inland seas than anything else. Those who have never seen the like can scarcely form any adequate idea of them. To describe them would be difficult. When crossing the Ouse in January, we recollect, a mill was seen on the left, rising out of the troubled water; the miller's cart was piloting along the highway—the water fully mid-rib upon the horses. The distance before us was one

broad sea of muddy water; which was so thick as to leave the road imperceptible. In such a state one thing is obvious—the incalculable loss to the farmer. The deficient crops, the high prices, and the thousand consequences which follow, have formed the all-engrossing topic of comment in the columns of the local newspapers, as well as of the agricultural press, ever since; and the late floods, which have washed away hay crops, and otherwise damaged corn, turnips, &c., form a new edition of the same calamity, filling with fresh grief the columns of our journal, and overshadowing the provinces with consequences more easily imagined than described.

The imperfect drainage of the country has long been a subject of complaint; and the more perfectly the work of land-drainage is performed, removing the water more speedily from the soil into the rivers and their tributaries, the more cause will there be found for complaining. Indeed, circumstances have already attained to that degree as to be wholly intolerable any longer; for the same depth of rain which would formerly have been removed without doing much harm—for instance—now inundates whole provinces, converting them into inland seas during winter and summer floods—floods which not only descend into the valleys in less time, but in larger volumes, so that the channels of rivers have actually to carry off more water during the currency of the year; for, prior to the lands being thorough-drained, comparatively level clay lands were in themselves literally inland seas, from which the water was removed by evaporation. The amount of stagnant water thus removed is scarcely credible, so that differences would of themselves form rivers of no ordinary magnitude. To discharge a given quantity of water in forty-eight hours, and to discharge a greater quantity in twelve hours, are two very different propositions in hydraulics, requiring the capacities of rivers to be equally different. Any hydraulic engineer who takes the trouble to measure the capacity of any river, as the Ouse at Huntingdon—the quantity of water which it is capable of discharging in forty-eight hours—and then calculates the additional measurement which would be required to discharge the same in one-fourth of the time, will acquire data sufficient to enable him to form a pretty accurate estimate of the river drainage of the country, and the work which must be done before the calamities in question can be averted. At present, the difference may not be so great, in all cases, as the quantity of water which the channels of rivers would discharge in thirty-six hours, minus their ordinary currents; for in many instances land-drainage is yet very imperfectly performed, while in not a few the work has scarcely begun: hence the obvious conclusion. But, conceding to facts of this kind their full weight, the deduction is still obvious that the nearer we approach to perfect land drainage, the nearer we arrive at this difference; and we are apprehensive that, in not a few instances, it will be already fully borne out, for large valleys—as those of the Ouse and Nene—were reduced to inland seas in very brief time, last winter and spring, while such inland seas were more than thirty-six hours in being removed, after the rain and floods had ceased.

But we need not waste further time in discussing preliminary questions of this kind, but proceed at once to the more practical ones of the performance of the work, and the necessary means to enforce it.

To improve the channels of rivers so as to carry off the greatest floods after the provinces have been thoroughly land-drained, is a great work—probably one of the greatest which "British industry" has to perform—requiring engineering talents of no ordinary magnitude to execute it properly. We have briefly dismissed theoretical calculations; but such cannot be dispensed with altogether in drawing up the specifications or estimating the cost and profits of such a work, for practical merit must be conjoined with scientific attainments of the highest degree—*i.* e., calculations must be carefully made before the work is begun, and all the consequences duly weighed, so as to avoid having to do the work twice. For example:—The greatest volume of flood-water at present will form no safe guide for determining the capacity required by the new or improved channel; for calculations must be made for differences arising from evaporation of stagnant water in the soil, the increase of velocity or reduction of time in which rain water is removed to rivers, the present obstructions in rivers and the increase of velocity in them when such obstructions are removed—all these things must be duly settled before the workman lifts a spade. The heaviest thunder-showers and floods must be removed just as fast as they fall; and when the flood areas, or numbers of acres from which rivers remove rain water, and the depth of rain which falls during a thunderstorm are calculated, it will readily be perceived that an increase of capacity as well as increase of velocity will be required. No doubt Practice will adopt her favourite maxim in all doubtful cases, of "erring upon the safe side;" and in carrying out such a maxim, it will also be perceived by every one acquainted with the facts of the case, that many an old bridge, weir, and mill-wheel must disappear before the work is properly concluded.

Few travellers will lament the removal of many an old narrow bridge, provided better structures are erected in their stead, and in doing so the proper site will have to be selected; for the direction or line of roads is generally as much out of date as the character of old bridges. Hence new ones may probably be built, in the majority of cases, before the old are removed, leaving the item of expenses the only objection to be met with.

It will be otherwise with the removal of mills; for millers and manufacturers will complain, while their landlords will be sure to join them.

Steam mills should be erected before the present ones are removed, so as to enable millers and their landlords to retain their customers. Were such done, they themselves would be great gainers, were they even to perform the work at their own expense; for the new mills could be erected at some railway-station, town, or village—thus effecting a great economy of horse-flesh, while they could be kept going regularly afterwards, so as to perform double and triple the work. In point of fact, the progress of steam and railroads, together with the increase of floods, are rendering the watermills in question a losing concern; so much so, that unless their land-

lords erect steam-engines, they will at no distant date be without either millers or multure. Hence the obvious conclusion that the proposed change will be in their favour, whatever they themselves may say to the contrary on the question being first mooted. The case of the manufacturer is similar.

In many cases, probably the majority, the straightening of rivers would form a prominent item in the specifications of such a work—more especially tributary and small ones—because new channels could be cut at less expense often than the old could be improved, taking into consideration the keeping of them in order for the first few years, while they would occupy less ground. Where they formed boundary lines of estates some difficulty might be experienced; but difficulties of this kind are more imaginary than real, under the operation of an act of parliament; for, as Marshal long ago justly observed, "a river is the most unfortunate boundary line of an estate." Inland navigation would a few years hence, have been experienced as another objection to the alteration of the channel of many rivers; but railroads and steam-power have removed such. No doubt a certain loss would still be sustained were the velocity of rivers increased so as to prevent the working of boats on them; but losses of this kind would be experienced very much like the losses of millers and their landlords—a great gain in the long run, and even in the outset form no valid objection to the straightening of rivers for improving the drainage of the country.

The angler would also experience a temporary interference with his sport, and therefore would doubtless lift his "rod;" but the improvement of the drainage of our rural and suburban districts would purify many a stream, rendering it more productive of finer fish eventually. Hence the brief conclusion.

Expenses and profits go together in the generality of cases; and in this one the latter would so preponderate as entirely to eclipse the former, for the profits would exceed the measure of our present losses, and these amount to so many millions sterling annually, that our readers would scarcely credit us were we to speak the entire truth on this point. The profits would be enormous, while the costs—when divided among those who would reap the benefits—would be unworthy of notice. No doubt the sum total would form a large investment before all the estimates were given in; but certainly less than that of railroads, generally speaking, while the profits would be greater, and the expenses of management afterwards comparatively nothing. Hence the obvious conclusion in favour of the pecuniary character of the project, as being a more safe and profitable investment for capital. River stock, we repeat, would form a much more remunerating and safe investment than railway stock.

For many reasons, capital for the execution of such a work should be raised on redeeming interest, and suitable provision made for keeping the work itself in repair by a general tax on those interested. The taxing of landlords and tenants to pay the interest during the redeeming term, and to keep up the work in a proper state of repair afterwards, would, doubtless, be a very nice problem; but Parliament would have no great difficulty in solving it, for all within the flood-area of the river would be interested in its improvement, and hence would have to be taxed. No doubt those occupying low and level lands along its banks, and immediately adjacent to its tributaries at their confluence, would be the greatest gainers; but this, while true in one sense, is rather starting a selfish view of the question upon the whole, for they are only greater gainers, it may be, because those more remote have first been still greater gainers. For example: equal quantities of rain must be admitted to fall upon equal areas, or numbers of acres, generally speaking. Now, if one landlord remote from the river land-drains or thorough-drains his estate—consisting of say five thousand acres—throwing off the water which falls upon them in one-fourth of the time, thereby drowning his neighbour who occupies a thousand acres along the edge of the river, it sounds very selfish, we say, of the former to say "the latter is the greatest gainer," especially if it is further proposed to tax him the heavier on that account. The river is made for the mutual interest of those having lands drained; hence they obviously ought to be taxed according to the number of acres. The landlord adjoining the river is only the greatest gainer because hitherto the greatest loser from floods—floods not his own, but those thrown upon him by other parties more remote; and the fact that he has been the greatest loser is the sole reason why the undertaking assumes a national character, and ought to be executed accordingly, as we shall shortly see under the next paragraph. He has not only been so, but will still be the greatest loser; for such improvements cannot be carried out without taking from him, in many cases, more or less land, besides subjecting him to all the annoyance connected with keeping the work in repair after it has been executed in every case. It is for the sake of landlords and tenants whose lands and farms are flooded, and crops carried away, that the work should be immediately executed; and therefore if they pay a proportionate share of the expenses, it is all that can fairly be expected of them. For a similar reason, the repairs should be executed by a general tax, both before and after the principal invested is redeemed.

The improvement of rivers is a public undertaking, and ought therefore to be placed under the control of Government, like all other public works. Indeed, the work is of such a character and magnitude, that a special Parliamentary commission would be indispensable before men qualified to take the superintendence of it could be had; and its successful issue would in a great measure depend upon the appointment, for although there would always be many landlords and tenants interested in the work, being within the flood area of the river, and hence subject to be taxed, men practically acquainted with the science of hydraulics in all its branches, and whose services therefore ought always to be invited, yet whose judgment would be so swayed by majorities possessing very opposite talents and interests, that unless commissioners were qualified to discern between facts and opinions, or right and wrong, themselves, apart from the judgment of others, a suc-

cessful issue could hardly be expected. Take, for example, the Loch Neugh fishery case, and the deepening of the river Bann, in Ireland—a question which has long excited general interest on both sides of the Channel. In this case thousands of acres are yearly flooded, summer and winter. The lower Bann could easily be deepened, so as not only to obviate this, but also to reclaim from the lake a new province almost. The question has several times, we believe, been brought before Parliament, but leave to deepen the river refused in consequence of the opposition of the company who have the fishery. A large public interest is here sacrificed to a private one, because treated as a private question. Had the question been brought before Parliament as a public one, the interest of the fishery would have sunk into insignificance, comparatively speaking; but the opposition of the company, and other companies, as the Newry Canal, &c., with the adverse interest of landlords and tenants whose lands are not flooded, and who would derive no benefit from the reclaiming of the lands in the basin of the lake when drained, would still remain to be disposed of by the River Drainage Commissioners, who would have to guard against their objections, so as to do justice to private interests as well as public, avoiding a sacrifice of either. Hence the conclusion.

The improvement of the river drainage of the country would at the same time improve its sanitary state, for stagnant rivers, pools, and streams full of decomposing vegetable and animal matter, form a source of pestilence in almost every rural district more easily imagined than described, both in summer and winter. In summer, for example, towns and villages pour their sewage into streams where the flow is often insufficient to remove it; so that animal, vegetable, and mineral substances are deposited in pools and among water-plants, the consequence of which is that the water becomes one living volume of anamalculæ. As the stream becomes shallower and shallower, from the summer drought, vegetation proceeds from its banks, until it finally closes in the middle, intercepting the current altogether, so that what water now flows into it is evaporated, the balance becoming thicker and thicker, until too putrid for animal and vegetable life; then the work of decomposition follows, loading the surrounding atmosphere with pestilential gases of the most deadly kind—hence the consequences to the health of the district. Much as has been said about the polluted state of the river Thames from the sewage of the metropolis, it sinks into nothingness when compared with the state of many rivers and streamlets in the provinces. Were it as bad as they, pestilence would complete its work in brief time, owing to the larger area which the capital occupies. But rural villages and towns are increasing in magnitude, and thus increasing the pestilence; hence the deduction in favour of the improvement of our rivers as a national undertaking. In winter, again, flooded and badly drained districts give rise to fogs and a host of meteorological vapours injurious to the health of every living creature, whether animal or vegetable. Urban districts, therefore, are equally interested in the question at issue with landed, and consequently ought to be taxed by Parliament accordingly, and the work executed under its control.

Such is a very imperfect outline of this interesting subject—which the late floods have just brought before us afresh. Its importance must be manifest to all, and obviously calls for the special consideration of the Legislature in the next session of Parliament. The duty of M.P.'s for counties is plain, the farmers being the greatest losers. It is a question, however, not only involving the interest of agriculture, but the health of our manufacturing and commercial districts. The whole community is therefore interested in the immediate river drainage of the country, without an exception; so that the sooner the question is publicly discussed, the sooner is the work likely to be executed. To assume a passive indifference to remedial means, when our land is covered with water in seed time, and our crops swept away before our eyes in harvest, is unpardonable, and altogether unbecoming the character of Englishmen.

REMARKS ON THE POTATO PLANT.

BY DAVID FERGUSON, ESQ.

The following very interesting paper, by David Ferguson, Esq., was read by the Rev. Mr. Porter, before the Kilkenny Literary and Scientific Institution. Prefixed to it being an engagement by Mr. Ferguson to pay the £500 promised in the paper, when the Council of the Literary and Scientific Institution of Kilkenny decide it fairly gained. The Provincial Bank of Ireland, Kilkenny, is named as reference. The seed mentioned in the paper may be obtained from Robert Molyneux, Esq., John's Bridge, and from Mr. William Bryan, Scotch House, Kilkenny:—

"The potato plant is only an annual, empowered by God with two modes of reproduction. The one, like the oak tree, lives only for years; the other, like the acorn, liveth for ever. Both reproductions are deposits from the plant, different in chemical properties; '*live and die*' independent of each other, with the plant providing for, but independent of, both.

"Here (exhibiting a potato stalk) is the plant. This stalk, with its small fibres, is the annual. These eight apples upon the top possess each from three hundred to three hundred and twenty seeds; each seed has the germ of a plant with seed lobes, which perform the same office to the germ that the yolk of an egg does to the germ of a bird, supplying it with nutriment until all its parts are perfected by germination to supply itself.

"Hence the seed in the potato apple is, like the acorn of the oak, the seed in the apple of the tree, or the egg of a hen. These eight potatoes at the bottom of the stalk possess each a quantity of eyes; each eye possesses the same property *for a time* that the seed or egg of a hen does; but the potato, like the tree and hen, *becomes* aged and past bearing; the oak lives after it *ceases to bear*, as do also the apple tree and the hen, and *so also does* the potato. But the oak, the apple tree,

and the hen die from age, and why not also the potato? Has nature made it an exception?

"Besides, like the oak, the apple tree, and hen, the potato has a graduated scale of ascending and descending life. Here (exhibiting a potato stalk) is a plant grown direct from the seed. Observe, the potatoes are small, like marbles. This stalk blossomed, but had not strength to form an apple. Here (exhibiting a large stalk) is another which is one year older. Observe the difference in the bulk of the tubers which it produced. They may be compared to a small egg increasing. This stalk also blossomed; and potatoes thus grown from seed continue to blossom up to five years, and then first begin to form apples. Here (exhibiting a stalk) is a plant six years' old, which bore an apple; consequently I call the parent of this apple a potato; the plants before it not being able to perform the functions of a potato I call germs, Nos. 1, 2, 3, and so on, ascending according to their age.

"Now to get at the descending germ let us take this lumper (now exhibited). I can trace the history of this kind of potato back to the year 1818; and I am told that from 1825 to 1835 it was so charged with vitality that it would grow without manure in any soil, of large size, and producing 160 barrels to the acre, but of a quality more fit for cattle than for man. Then was the time to take seeds from its apples, and have the young rising into strength for cattle, and the old losing strength, but becoming more dry and floury, for man's use.

"This lumper, once the prince of potatoes, like its great progenitors, the barbers, kerkippins, white Turks, red Turks, slipper-potato, peeler-potato of Connaught, black-bull of Kerry, and a host of others, each in their turn ruled supreme. They are now gone. Here is the lumper, the cup, English-red, and Irish apple; look at them. The red twelve years ago produced 160 barrels to the acre; at present, in the best land, it produces only 60 barrels; lumpers 40 barrels, and cups 30 barrels; and, like the ascending germs, they now blossom, but cannot grow apples; consequently all these kinds of potatoes enumerated may be called 'descending germs.' See this diagram shewing the life of the lumper. [Two ingenious diagrams, which, of course, we have no means of representing, were here exhibited and explained by the Rev. Mr. Porter.]

"The first diagram shews the potato existing for thirty-four years in three states of being; first, as an ascending germ in blossom for five years; a potato, with apples, for nineteen years; and there not being any apples seen upon the stalks for the last ten years, they then become descending germs, unable now to give any produce on mountain land, where they formerly grew. The law laid down in this diagram rules every potato, and the same law guides its seed; thus we find the plant to grow apples for nineteen years.

"The second diagram shows the plant ascending in vitality for ten years, its longest day, and green from five to seven months, in proportion to its age; then descending, losing its vitality, from its tenth to its nineteenth year; at which period it remains green only five months, and produces no seed. Thus the seed supplied by the parent plant at its longest period must of necessity be best and strongest. The descending germ of the tenth year will remain green only three months, and with little produce. Hence, seed from the plant at ten years is perfect; the other only in proportion to its place in the diagram; consequently I fear it is hardly possible to procure good seed now, and I question if ever perfect seed has been sown, except by fortunate accident, the belief hitherto entertained being, that the seed was only to give variety of kinds.

"The plant at transplanting is as perfect in all its parts as the oak, the apple tree, or the female bird from the egg. The root performs the same functions to the plant that the stomach does to the animal—absorbs juices from the earth and transmits them through one set of vessels to the leaves, which are a continuation and extension of the same vessels and matter. These extend their surface for absorption and transmission of air and moisture, assimilate the juices, and return them through another set of vessels to nourish and enlarge the various parts of the plant. Thus, the leaves perform the same functions as the lungs of the animal, besides giving shade to the vegetable. These truths point out the true mode of cultivating ascending and descending germs, and also the potato. The plant from a perfect potato lives seven months, perfecting its fruit before it dies. The plant from descending germ lives only from five to three months, unable at either stage to perfect its fruit. Therefore, when the plant dies, the fruit not being ripe continues to absorb the decomposing matter in the leaves and vessels, until these vessels close. Consequently, when we see the leaves getting spotted and black, and emitting an offensive smell from decomposing matter, we should at once dig the crop to save what potatoes exist, and turn the land to some useful purpose. This is what we, in our wisdom, call 'the incomprehensible potato disease,' produced, you will observe, by our own neglect of the immutable laws of God and nature.

"The largest potato, being first from the plant, and consequently longer in the world than the small one, is best for seed. This (producing a tuber) is a potato with twelve eyes, consequently containing twelve plants. If I set it whole I put twelve plants to live upon the land of one; in other words, I put twelve cows to live upon one cow's grass. Therefore, scoop out the eyes of the large potatoes for seed, and use the rest. Let seed potatoes be the largest, and left in the light until they become green. They are thus best for seed, but not so good for the table, the oxygen having escaped. To keep potatoes for use, turf char is best; it will keep them perfect, though not a month old.

"To give an idea how to manage potato seed for sale or use:—Hang up the apples in the barn or other out-house, in the light, until they become white, soft, and pulpy, like a ripe gooseberry; then press out the seed into water, and throw away the hull; wash the glutinous matter from the seed by change of water, and dry it in the sun; or take a pulpy apple and press out the seed between the folds of blotting paper, the paper absorbs all the glutinous matter, and you will find from 300 to 320 seeds (a sufficient quantity for one farmer). Another mode:—Cover the apples in sand, which will absorb the hull and glutinous matter; and in spring sow sand and seed together in a hot-bed, which is simply twelve inches of stable manure covered with two inches of earth. I transplanted 800 plants from a box four feet long by one foot wide, when the plants were from four to six inches above the earth, to drills eighteen inches apart, and sixteen inches between each plant. March or April is the best time for transplanting, and drills should be adopted in every instance in preference to lazy beds, because the latter retain rain and grow weeds, which prevent the circulation of air, and cannot be easily got at. The juices of the potato sleep during winter and awake in the

spring; therefore, do not plant before February. The experiments stated in this paper can be tried and tested equally by the learned sage or unlettered peasant, for one shilling.

"This paper demonstrates, from the leaf being the lung of the plant, that the potato cannot possibly grow after the leaf dies, except we suppose it to grow upon decomposing matter; and the diagrams demonstrate that there never was any disease in the plant or potato. Why and whence then are these various antidotes against the 'mysterious incomprehensible potato disease' leading the peasantry of these realms to lose their land, manure, and labour, year after year? A Frenchman tells us to insert a pea in each set to absorb the superabundant moisture—the cause of blight. An Englishman bids us plant in tan; a Scotchman tells us to plant in peat char, because, having ninety-six per cent. of carbon, it is, like the pea and tan, a certain cure. The Royal Agricultural Society of Ireland has a gentleman that professes to take the sting or disease out of the potato by some chemical charm; and there is another gentleman who undertakes to extract the sting from the earth! *but neither of them tell how.* These, like other varieties of mysterious cures and causes whispered from man to man, stagger the senses and make reason real. Therefore, in order that the truth of my views, and the virtues of these charmers, may be fully tested, I have lodged FIVE HUNDRED POUNDS in the Provincial Bank, which I now freely offer to them and the world, if they bring to this Society, within three years, the following potatoes, which have been the principal support of the peasantry of this country for the last thirty-four years—namely, the old Irish apple, the cup, the English-red, and the lumper, in the same strength that I show this stalk, with apples upon the top, potatoes at bottom, and remaining green from 12th April to 12th October.

"The potatoes now exhibited (and which are open to inspection until seed time) shew ten distinct varieties, ranging from one to six years old; these have never been in the world before, and their existence demonstrates that the power to grow them existed previous to, and since the blight of 1845 and 1846."

NUTRITIVE MATTER IN PLANTS.

In this age of discovery we know of hardly anything which has been more completely revolutionized than the system of determining the quantity of nutritive matter in the different kinds of plants suitable for fodder. It seems as if the very *principle* of feeding on nutritive matter was utterly unknown at a period when many elaborate tables of these supposed relative qualities were published. Sir John Sinclair, if we recollect right, had a series of examinations made, with a view to determine the quantity of nutritive matter in plants, which Sir H. Davy appended to his lectures on agricultural chemistry. Hence, though it cannot be said that he was entirely responsible for their accuracy, he most certainly stood committed to the principle by which they were ascertained. And that principle appears to have been, simply ascertaining the amount of *soluble matter* each plant contained. This was the criterion of merit in the scale of nutrition; and on these tables all the theories of writers on vegetable nutrition seem to have since been based. We remember some time ago recommending the adoption of cow-grass for red clover, in sowing lands where the clover sickness might be likely to be prevalent, as a sort of security against that malady. We urged that the hardy perennial had a more powerful vital hold on the soil—a greater tenacity of life—than the sickly biennial; the solid stalk of the former was less susceptible of the influences of oxygen and of frost than the hollow stalk of the clover—for there is really this decided physical difference. And soon some writer, founding his observations on the assumed authority of these tables of nutrition, showed us that we were sadly wrong in our conclusions, because the red clover was vastly, according to this table, more nourishing than the cow grass. We once put our farm under a tare-rotation, instead of red clover. That crop was substituted for the clover with great advantage to the production of the latter; but we found it to be too scourging to be persevered in as a crop. We dried it and saved it much after the manner of clover, though it was far more difficult to secure. Against this many parties made sad objections, on the ground that the tare was far inferior to the clover in the point of nutritive value, and that it was not advisable to grow it, even if two thirds more weight per acre of tare than of clover could be obtained. Again, we have been sadly rated for mixing the hardy trefoil amongst the more favourite, but more delicate white clover. It sufficed us to find the trefoil would grow and thrive—would afford some sort of food when white clover was somewhat deficient. We saw the sheep and horses eat it, and this was sufficient for us, because we preferred what we were convinced, without much arguing or evidence, was inferior to the white clover, but vastly superior to the weeds which would grow if the cultivated plants did not.

It was not until lately that doubts were cast upon the whole groundwork and principles of the tables appended to Davy, and with almost simultaneous steps Dr. Voelcker and Mr. Anderson discovered the whole to be a fallacy. We have before us Dr. Voelcker's results, which are more worthy of attention than those of Mr. Anderson, because they were from crops grown on land in a natural condition, and on the same land; whereas, if we rightly recollect, the Doctor's were from various localities. It is always more trustworthy to have specimens of plants analyzed for comparatively nutritive purposes, to select them from the same spot; be-

cause cultivation, and especially manure, will have the greatest influence on the composition of the plants:

Taking the clover and the trefoil—the white clover especially—we find the following comparative results.

	White clover.	Trefoil.
Water	83.65	77.570
Nitrogenized matter capable of producing flesh	4.52	4.481
Substances free from nitrogen capable of sustaining respiration	10.26	15.949
Inorganic substances	1.57	2.000
	100.00	100.000

We can well believe how this statement will startle many who imagine that the trefoil contains scarcely any nutritive qualities. Nor was the opinion of the red clover and the tare less correct, as the following comparison will show:—

	Red Clover.	Tares.
Water	80.640	82.16
Nitrogenized organic matter capable of producing flesh	3.606	3.56
Substances not containing nitrogen, and fitted for the support of animal heat and for laying on fat	13.784	12.74
Inorganic matter	1.970	1.54
	100.000	100.00

Now, although the clover is certainly a little superior in all the desirable elements, still when we reflect that as much as from one-third to two-thirds more can be grown per acre of the tares than of the clover, the result, taken by the area, would be somewhat in favour of the tares.

The results of the experiments go to show another particular which practice had before laid down—that the cabbage was a most valuable feeding plant, and that it stands, in fact, amongst the highest of all agricultural productions; the nitrogenized matter standing as high as 4¾ per cent., and the fat-forming or respiratory matter 7 1-10th per cent. The experiments showed, moreover, the value of the white mustard as a green food, presenting a per-centage of 3.287 of nitrogenized and 7.273 of carbonaceous or respiratory matter. The rape stands considerably below this in flesh-forming materials, though above it in the fat-forming matter; and the mustard is a crop which may often be taken with advantage before a rape crop is sown, and would not be a bad substitute for clover when the latter was a doubtful crop.

We may well anticipate that great results will follow from these small beginnings in researches on vegetable constituents as applicable for food for the animals the farmer wishes to grow and fatten.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Monthly Council was held at the Society's House, in Hanover-square, on Wednesday, the 3rd of August. Present: Mr. Pusey, President, in the chair; Mr. Raymond Barker; Mr. Barnett; Mr. Hodgson Barrow, M.P.; Mr. Bramston, M.P.; Mr. Brandreth; Mr. Burke; Colonel Challoner; Mr. Druce; Mr. Garrett; Mr. Grantham; Mr. Hamond; Mr. Fisher Hobbs; Mr. Milward; Mr. Mainwaring Paine; Mr. Sillifant; Professor Simonds; and Professor Way.

Finances.—Mr. Raymond Barker, Chairman of the Finance Committee, laid before the Council the monthly report on the accounts of the Society; from which it appeared that the current cash balance in the hands of the bankers was £2,232. He also submitted to the members the quarterly balance-sheets of income and expenditure, and of invested property and liabilities. The Council adopted this report, and the suggestion of the Committee that the thanks of the Council should be conveyed to the County of Gloucester Bank, for the courtesy and exactness with which they had acted as the local bankers of the Society during the period of its country meeting, recently held in that city.

Vice-President.—On the motion of Mr. Raymond Barker, seconded by Mr. Hamond, Lord Ashburton was elected one of the vice-presidents of the Society, in the place of the late Earl of Ducie.

Members of Council.—On the motion of Mr. Raymond Barker, seconded by Mr. Barnett, the Hon. Alexander Leslie Melville, of Branston Hall, near Lincoln, was elected one of the general members of Council, in the place of the late Professor Sewell; and on the motion of Mr. Fisher Hobbs, seconded by Mr. Garrett, Mr. Nathaniel George Barthropp, of Cretingham Rookery, near Woodbridge, Suffolk, was elected one of the general members of the Council, in the vacancy created by the transfer of Lord Ashburton's name to the list of Vice-Presidents.

Poultry.—The Council appointed Mr. Milward, Mr. Barnett, Mr. Simpson, and Mr. Brandreth Gibbs, to act as a committee on all inquiries connected with the farm-poultry exhibited at the late meeting at Gloucester, and on suggestions for the regulation of their future exhibition; with a request that the committee would report on these subjects to the Council at the monthly meeting in December.

Condition of Cattle.—Mr. Lister Maw's suggestions were received from the General Meeting at Gloucester, and referred to the Special Council in December, when the regulations for the Society's exhibition at Lincoln would be taken into consideration.

Lincoln Committee.—On the motion of Mr. Brandreth, seconded by Mr. Milward, the Council agreed

to the following list of the General Lincoln Committee: Lord Ashburton (chairman), Hon. A. Leslie Melville (vice-chairman), Earl of Yarborough, Hon. R. H. Clive, M.P., Right Hon. Sir John Trollope, Bart., M.P., Sir John Villiers Shelley, Bart., M.P., Sir John V. B. Johnstone, Bart., M.P., Sir Montague Cholmeley, Bart., Mr. Raymond Barker, Mr. Barnett, Mr. Brandreth, Mr. Cavendish, Colonel Challoner, Mr. Evelyn Denison, M.P., Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hudson (Castleacre), Mr. Jonas, Mr. Milward, Mr. Simpson, and Mr. W. B. Wingate (all trustees and vice-presidents of the Society being *ex-officio* members). It was arranged that this committee shall continue in force until the Lincoln meeting, and should meet without summons at 11 o'clock A.M. on the first Wednesday of every month, excepting in the months of September, October, and January; and by summons at such special times as the country meeting business might require.

IMPLEMENT PRIZES.—The Council, agreeably with their standing resolution, took into consideration the prizes to be offered for agricultural implements and machinery, at the Lincoln meeting next year, and postponed the question of their final adoption until the first Wednesday in December: Mr. Slaney's offer and Mr. Denison's recommendation of a prize, with suggestions from Mr. Eggar on the classification of implements, and from other parties, were referred for consideration to the same date. Mr. Hamond's communication of a memorial from the principal implement makers, and suggestions of his own, for rendering the exhibition and trial of implements at the Society's country meetings still more instructive and generally useful, were referred to the Implement Committee of the Society, with a request that they would also report on the subject to the Council at their monthly meeting on the first Wednesday in December.

ROYAL VETERINARY COLLEGE.—Professor Simonds laid before the Council the annual report of the Governors of the Royal Veterinary College on the progress during the past year in the application of the veterinary art to cattle, sheep, and pigs. This report was referred to the Journal Committee.

JOURNAL.—The Council, on the representation of Mr. Wentworth Dilke, a life-member of the Society, and one of the British Commissioners to the United States of America, now resident at New York, ordered a complete set of the Society's Journals to be forwarded to the Smithsonian Institute at Washington.

DEPOSITS OF GUANO.—Mr. Faulks, of Crosby, near Liverpool, and Mr. James Bell, of York Place, Edinburgh, favoured the Council with interesting statements connected with the important discovery of extensive excrementitious deposits of sea birds, on islands and caves along certain ranges of the eastern coast of Africa. They also forwarded to the Council with these statements a collection of samples, showing the varying nature of the deposits according to circumstances of situation and depth. Among these was a deposit containing 80 per cent. of phosphate of lime (without carbonate), and a crystallised substance containing 91 per cent. of nitrate of soda, "found in small lakes, upwards of a yard and a-half in diameter, in caverns, and in valleys; and surrounding these small lakes, as crystallised incrustations, to an almost incalculable amount." These gentlemen remark, in reference to the guano: "The immense amount of deposited guano cannot be calculated; it is found in extensive caverns as deep as could be pierced with two boarding pikes, lashed together, about 12 feet. It is also found completely covering the side of the island less exposed to rains. The discoverer's words are, 'There is enough to supply Great Britain for 20 years;' and he is an old and respectable commander and part owner, whose experience in the guano trade is of long standing." The Council ordered their best thanks to Messrs. Faulks and Bell for the communication then made to them on the important question of a cheap and abundant supply of guano to the farmers of this country, and which the Council referred to the Guano Committee of the Society.

MISCELLANEOUS COMMUNICATIONS.—Mr. C. Hampden Turner informed the Council of a report made to him by Sir John Rennie of the successful cultivation of potatoes planted in alternate rows with hemp. The Rev. Philip Gurdon suggested further trials on the exact influence of inoculation for pleuro-pneumonia on healthy animals. Mr. Tippetts communicated a paper on the application of soot as a manure. Mr. Garvens on Irish moss. Mr. Clarke, Mr. Hunt, and Mr. Curwood, on improved tillage. Mr. Walkinshaw, of Belfast, specimens of potatoes, and a copy of his work on their cultivation.

ADJOURNMENT.—It was decided, on the motion of Mr. Raymond Barker, "That the customary leave of absence be granted to the secretary, and under his direction to the clerks of the establishment, during the ensuing adjournment," which was fixed to extend to Wednesday, the 2nd November.

NEW MEMBERS.

The following new members were elected:

Banks, John Jackson, Kendal, Westmoreland
Barber, Samuel Wordsworth, Hayton Castle, Retford, Notts.
Birch, James, Newport, Monmouthshire
Buck, Albert, Sansome-terrace, Worcester
Clarke, G. Miller, Goldington House, Sarratt, Rickmansworth
Cooke, James Herbert, Berkeley, Gloucestershire
Cooke, Rev. Samuel Hay, Beckley Grove, Oxford
Crofts, John, Cirencester, Gloucestershire
Cumberbatch, Lawrence Henry, Queen's House, Lyndhurst
Dalzell, Robert, 4, Pall Mall East, London
De Courzay, Viscount, Lusignan, France
Everington, William, Skegness, Boston, Lincolnshire
Eyke, John, Stanton, Shifnal, Salop
Harker, James, Tibshelf, Alfreton, Derbyshire
Hemsley, John, Shelton, Bingham, Notts.
Jowitt, Christopher, Palterton, Chesterfield, Derbyshire
Kingdon, Samuel, Layrich, Thorverton, Devon
Kirkpatrick, Thomas, M.D., Glasnevin, Dublin
Lindow, Henry William, Gowcomb, Stow, Gloucestershire
Livesey, R. N., Preston, Lancashire
Longcroft, C. T., Havant, Hampshire
Michael, Michael John, Swansea, Glamorganshire
Oldham, George, Alfreton, Derbyshire

Oldham, John, Carlton-on-Trent, Nottinghamshire
Patterson, Cook Tylden, Ihornden, Bidenden, Kent
Power, K. Manley, Hill Court, Ross, Herefordshire
Radnor, George, Courthayes, Thorverton, Devon
Rayer, Rev. Henry, St. Athan's, Cowbridge, Glamorganshire
Redgate, Thomas Blatherwick, Scarthing Moor, Tuxford, Notts.
Samman, John, Oddington, Stow, Gloucestershire
Scott, Thomas, 5, Charing-cross, London
Seymour, Rev. Sir John H. C., Northchurch, Berkhampstead
Smith, John Banks, Langrick, Boston, Lincolnshire
Snead, John Best, Eastcliff, Chepstow, Monmouthshire
Stanbridge, Thomas, Kiddington, Enstone, Oxon
Thurlow, Thomas Lyon, Baynard's-park, Guildford, Surrey
Turvill, George, Manor Farm, East Shalford, Surrey
Webster, Crayston, Kendal, Westmoreland
Wilson, J., Shaw Farm, Home Park, Windsor.

ROYAL AGRICULTURAL SOCIETY OF IRELAND.

The following is the list of prizes awarded in the respective classes at the cattle show in Killarney :—

SHORT-HORNED.

For the best bull calved on or after the 1st January, 1848, and previous to 1st January, 1851, 30 sovs., Lord Talbot de Malahide. This bull also obtained the gold medal as best of all the prize bulls in the yard; second best ditto, 10 sovs., James Douglas, Athelstaneford Farm, Drem, East Lothian.

For the best bull calved in the year 1851, 20 sovs., Charles Towneley, Towneley Park, Burnley, Lancashire; second best ditto, 10 sovs., Hon. L. H. King Harman, Newcastle, Ballymahon; Robert Maxwell, Islanmore, Croome, commended.

For the best bull calved on or after the 1st January, 1852, 15 sovs., William Talbot Crosbie, Ardfert Abbey, Tralee; second best ditto, 5 sovs., Robert Holmes, Waterstown, Glasson; Richard Welsted, Ballywalter, Castletownroche, commended.

For the best cow, in calf or in milk, of any age, 15 sovs., Charles Towneley, Towneley Park, Burnley, Lancashire. This cow also obtained the gold medal as the best of all cows and heifers, and a first class medal to the breeder, and the Purcell challenge cup, as the best animal in the neat cattle classes. Second best ditto, 5 sovs., Lord Viscount Monck, M.P., Charleville, Enniskerry. John J. Turner, Kilcullen, highly commended. Sir Edward M'Donnel, Merrion-square, and John Christy, Esq., Fort Union, Adare, commended.

For the best heifer, in calf or in milk, calved in 1850, 15 sovs., Viscount Monck, M.P., Charleville, Enniskerry.

For the best heifer, in calf or in milk, calved in the year 1851, 10 sovs., James Douglas, Athelstaneford, Drem, East Lothian. Second best ditto, 5 sovs., James Douglas, Athelstaneford, Drem, East Lothian.

For the best heifer, calved on or after the 1st of January, 1852, 10 sovs., James Douglas, East Lothian. Second best ditto, 5 sovs., James Douglas, East Lothian; short-horned heifer. Lord Talbot de Malahide, for short-horned heifer, highly commended.

James Douglas, Esq., commended

OTHER LARGE BREEDS.

For the best Devon bull calved on or after the 1st January, 1840, 10 sovs., the Earl of Charlemont.

For the best polled Angus or Galloway bull calved on or after 1st January, 1848, 10 sovs., A. Grierson, Ardsalla, Fethard, county Tipperary.

For the best Devon cow, in calf or in milk, of any age, 5 sovs., the Earl of Charlemont.

For the best polled Angus or Galloway cow, in calf or in milk, of any age, 5 sovs., Adam Grierson, Ardsalla, Fethard, county Tipperary.

For the best Devon heifer, in calf or in milk, calved on or after 1st January, 1850, 5 sovs., the Earl of Charlemont.

For the best polled Angus or Galloway heifer, in calf or in milk, calved on or after 1st January, 1850, 5 sovs., Lord Talbot de Malahide.

For the best Devon heifer calved on or after 1st January, 1852, 3 sovs., the Earl of Charlemont.

For the best polled Angus or Galloway heifer calved on or after 1st January, 1852, 3 sovs., Messrs. Stavert and Fair, Green Hills, Castlebar, county Mayo.

SMALL AND MOUNTAIN BREEDS.

For the best Ayrshire bull called on or after 1st January, 1848, 5 sovs., Charles William Hamilton, Hamwood, Dunboyne.

For the best West Highland bull, calved on or after 1st January, 1848, 5 sovs., William Owen, Blesington, county Wicklow.

For the best Kerry bull, calved on or after 1st January, 1848, 5 sovs., the Earl of Charlemont. Second best ditto, 3 sovs., James Butler, Waterville, Cahirciveen.

For the best Ayrshire cow in calf or in milk, of any age, 4 sovs., N. W. Roche, M.D., Carrickabrick, Fermoy.

For the best West Highland cow, in calf or in milk, of any age, 4 sovs., Thomas H. Thompson, 95, Leeson street, Dublin.

For the best Kerry cow, in calf or in milk, of any age, 4 sovs., James Butler, Esq., Waterville, Cahirciveen. Second best ditto, 2 sovs., William Owen, Blesinton, county Wicklow.

For the best Ayrshire heifer, in calf or in milk, calved on or after 1st January, 1851, 3 sovs., Charles William Hamilton, Hamwood, Dunboyne.

For the best West Highland heifer, in calf or in milk, calved on or after 1st January, 1850, 2 sovs., Captain Croker, Ballytore House, Ballytore.

For the best Kerry heifer, in calf or in milk, calved on or after 1st January, 1850, 3 sovs., John Dwyer, Bunrour, Killarney.

For the best lot of two Ayrshire heifers, calved on or after 1st January, 1852, 3 sovs., N. W. Roche, M.D., Fermoy.

For the best lot of two West Highland heifers, calved on or after 1st January, 1852, 3 sovs., Fitzmaurice Pratt, Grangebeg, Dunlavin.

For the best lot of two Kerry heifers, calved on or after 1st January, 1852, 3 sovs., John Brennan, Belleville, Killarney.

THE TOWNELEY CHALLENGE CUP, VALUE 50 SOVS.

(To be competed for exclusively by *bona fide* Irish tenant farmers. Given by Charles Towneley, Esq., Towneley Park, Lancashire).

For the best lot of three breeding cows or heifers, of any breed, for general purposes, in calf or milk, not less than three years of age, the property of a *bona fide* tenant farmer, John Christy, Esq., Fort Union, Adare.

HORSES.

For the best cart stallion, over three years old, 20 sovs., Silvester Rait, Rathmoyle, Edenderry; second best ditto, 10 sovs., George Thompson, Kilmore House, Cashel. Highly commended, Alexander Binnie, Santry, county Dublin.

For the best roadster stallion, 15 sovs., John Cassidy, 52, James's-street, Dublin.

For the best cart mare, in foal, or with a foal at her foot, or having reared a foal in the year 1852, 10 sovs., Silvester Rait, Rathmoyle, Edenderry; second best, 5 sovs., Peter B. Mosse, Rutland House, Carlow.

For the best cart filly, not exceeding three years old, 5 sovs., Silvester Rait, Rathmoyle, Edenderry. Highly commended, and recommended for an extra prize, James Douglas, Athelstaneford, Drem, East Lothian.

SHEEP.—LEICESTERS.

For the best shearling ram, 15 sovs,. Frederick Fownes Hamilton, Windmill Farm, Edenderry; second best, 5 sovs., Ambrose Bole, Park-place, Tashinny.

For the best two-shear ram, 10 sovs, Frederick Fownes

Hamilton, Windmill Farm Edenbury; second best, 5 sovs., George Spencer, Normanton House, Hinckley, Leicestershire. Commended, James Douglas, Athelstaneford, Drem, East Lothian.

For the best ram of any other age, not exceeding six years old, 10 sovs., George Spencer, Normanton House, Hinckley, Leicestershire; second best, 5 sovs., do, do.

For the best pen of shearling ewes, 10 sovs., Joseph Sharpe Spencer, Hinckley, Leicestershire; second best, 5 sovs., James Douglas, Athelstaneford, East Lothian.

For the best pen of five ewes, not exceeding five years old, 10 sovs., Frederick Fownes Hamilton, Windmill Farm, Edenderry; second best, 5 sovs., do., do.

OTHER LONG-WOOLLED SHEEP, NOT QUALIFIED TO COMPETE AS LEICESTERS.

For the best shearling ram, 10 sovs, Silvester Rait, Rathmoyle, Edenderry; second best, 5 sovs., do., do.

For the best two-shear ram, 8 sovs., Frederick Fownes Hamilton.

For the best ram of any other age, not exceeding six years old, 8 sovs, Sylvester Rait, Rathmoyle, Edenderry; second best, do., do.

For the best pen of five shearling ewes, 6 sovs., Rowland Campion, Cromore, Doneraile; second best, 3 sovs., do., do.

For the best pen of five ewes, not exceeding five years old, 6 sovs., Sylvester Rait, Rathmoyle, Edenderry; second best, 3 sovs, Thomas Ball, Robert's Walls, Malahide.

CHEVIOTS, OR ANY OTHER MOUNTAIN BREED.

For the best pen of five shearling ewes, 5 sovs., the Marquis of Conyngham; second best, 3 sovs., do., do.

For the best pen of five ewes, not exceeding five years old, the Marquis of Conyngham; second best, 3 sovs., N. W. Roche, M.D., Carricabrick, Fermoy.

SOUTHDOWNS.

For the best ram of any age, not exceeding five years old, 8 sovs, William Owen, Blessington, county of Wicklow.

For the best pen of five shearling ewes, 4 sovs, Thomas Henry Marmion, March Farm, Skibbereen.

For the best pen of five ewes, not exceeding five years old, 4 sovs., William Owen, Blessington, county of Wicklow.

SWINE.

For the best boar, under eighteen months old, 10 sovs., William Murray Hickson, Doone Farm, Tralee; second best, 5 sovs., Joseph S. Spencer, Hinckley, Leicestershire. Commended, Messrs. Stavert and Fair, Green Hills, Castlebar.

For the best boar, over eighteen months, and under thirty-six months old, 8 sovs., Richard D. Chaigneau, Benown, Athlone; second best 4 sovs., George Roe, Nutley, Donnybrook. Highly commended, Lord Viscount Monck, M.P., Charleville, Enniskerry.

For the best breeding sow, under eighteen months old, 8 sovs., Alexander Davidson, The Abbey, Belfast; second best, 4 sovs., Captain Croker, Ballytore House. Commended, Thomas H. Broderick, Lionmount, County Cork.

For the best breeding sow, over eighteen months old, 5 sovs., Lord Viscount Monck, M.P.; second best, 3 sovs., Geo. Roe, Nutley, Donnybrook. Commended, Geo. Roe, Nutley, Donnybrook, and Rev. John Warburton, Kill, County Kildare.

For the best lot of three breeding sow pigs of the same litter, not more than ten months old, 5 sovs., Lord Viscount Monck, M.P.; second best, 3 sovs., Rev. John Warburton, Kill, County Kildare. Commended, Captain Croker, Ballytore House, Ballytore; highly commended, Joseph Pratt Tynte, Esq., Dunlavin.

IMPLEMENTS.

The following prizes were given for implements best suited to the wants and circumstances of Ireland:—

For the implement best calculated to turn up and expose to the air and frost of winter the deepest furrow, consistent with the regularity of surface, first-class medal.

Swing plough—William Graham, Dublin, first-class medal.

Trench Plough.—W. Grey, Belfast, a Second-class Medal.

For the best instrument for breaking up the subsoil, capable of being worked by not more than four horses, first-class medal—Robert Gray and Son, Uddington, Glasgow, subsoil plough.

For the best grubber or cultivator, to be worked by two or more horses, first-class medal—Thomas Eeles, for John Ellis, Thurles, Two-horse Grubber.

For the best Drill Grubber for green crops, first-class medal—R. Gray, Belfast.

For the best-constructed seed harrow, first-class medal—W. P. Stanley, Peterborough.

For the best horse-rake, first-class medal—Barrett, Exall, and Andrews.

For the best drill for sowing turnip seed, in one or in two drills, second-class medal—Thomas Eeles and Co.

For the best drill for sowing turnip seed, &c., with apparatus for distributing light, portable manures, the gold medal—James Smith and Sons, Peasenhall.

For the best and cheapest broad-cast manure distributor first-class medal—R. Garrett and Son.

For the best machine for drilling grain, the gold medal—R. Garrett and Son.

For the best horse hoe for cleaning between the drills of corn—R. Garrett and Son.

For the best machine for cleaning grain, first-class medal—R. Garrett and Son.

For the best machine for cutting turnips, first-class medal—W. P. Stanley, Peterborough.

For the best chaff-cutting machine, first-class medal—Richmond and Chandler, per Thomas Eeles and Co.

For the best machine for crushing oats, beans, or other grain, first class medal—William P. Stanley and Co.

For the best apparatus for steaming food for cattle, first-class medal—William P. Stanley.

For the best thrashing machine suitable for large farms and worked by either horse or steam power, the Council's gold medal—R. Garrett and Son.

For the best thrashing machine, suitable for small farms first-class medal—Ransome and Sims.

For the best hand-churn, worked by hand, first-class medal—William P. Stanley.

For the best set of horse-power gearing, economically adapted to fit machines, churns, thrashing machines, &c.—Barrett, Exall, and Andrews.

For the best machine for making drain tiles and pipes, first-class medal—G. Ingram, Dublin.

For the best lot of draining-tiles, second-class medal—G. Ingram, Dublin.

For the best assortment of hand implements used for the farm, such as draining-tools, spades, sickles, scythes, hoes, rakes, wheelbarrows, sack-holders, &c., first-class medal—William Edmundson and Co.

For the best and most economical set of farm harness, first-class medal—Cornelius O'Sullivan, Tralee.

For the best set of swing-trees or draught-bars, second-class medal—Ransome and Sims.

For the best and most economical iron field-gate, on correct principles, first-class medal—C. D. Young and Co.

For the best assortment of hurdles, or other moveable fence, suited for folding sheep on turnips, &c., first-class medal—Edward Hill and Company, for sheep folding hurdle.

To the subjoined implements, not classed in the prize list, the judges recommend the following awards:—

Double mould board plough, second-class medal—Mr. M'Connell, Dunleer.

Skim and broadshare plough, second-class—W. P. Stanley, Burtall.

Turnip scuffle, second-class medal—Thomas Eeles and Co.

Cake breaker, second-class medal—W. P. Stanley.

Root grater, first-class medal—Messrs. Bushe and Barton.

Bean crusher, second-class medal—Ransome and Sims.

Intermediate motion by two-horse gearing, first-class medal—Ransome and Sims.

Biggs' sheep-dipping apparatus—highly commended.

Collection of seeds from Thomas Eeles and Co., and from Haycroft of Cork—commended.

Galvanized wire garden seats, commended—C. D. Young and Co.

YORKSHIRE AGRICULTURAL SOCIETY.

Yorkshire—as a glance at the map will show—is something more of a district than that comparatively small extent of territory known as a county. It is an important district, too, in many ways; and in none more so than in the elements it possesses for agricultural success. With a race of landlords remarkable for their attachment to their own estates, and for the high character they have so long enjoyed as country gentlemen, Yorkshire unites a tenantry as distinguished for the spirit and acumen with which they engage upon the business of the farm. Those grand requisites, a grateful soil and efficient capital to work it with, are far less deficient here than in many other quarters; and even in so unpromising a pursuit as that of agriculture, owner, occupier, and labourer, all appear to do tolerably well.

It would be strange, then, if, with such good premises to go on, a Yorkshire agricultural society were not found to succeed. It has done so in a very eminent degree. With the exception only of the Royal Agricultural Society of England, we have none other that has advanced so steadily, or that is now so firmly established. The countenance of the proprietors has been from the first ready and sincere; while the breeders and farmers have entered into competition for the prizes offered, with that emulation so peculiarly characteristic of the Yorkshireman. The objects, moreover, of such a society would seem to have been as well directed as supported; while they have so far arrived at this progressive and satisfactory result—the meeting held at York on Wednesday and Thursday, July 3rd and 4th, was the best ever known. Whether we regard the number of entries for either stock or implements, or the interest evinced by the inhabitants of the county, as shewn by their attendance, the test is equally conclusive. Since the great struggle between Lord Eglinton and Lord Zetland, York has never been stormed with so many visitors.

Like the Royal Agricultural, the Yorkshire Society has one annual summer show, held in turn at some influential town within its limit. Of course this turn comes round more rapidly than in an institution of wider range, and York has now for the fourth time been selected as the site for this exhibition. The opening meeting was celebrated here in 1838; another visit followed in 1842; and in 1848 came a joint celebration of the local with the Royal Agricultural Society. Since then, Leeds, Thirsk, Bridlington, and Sheffield have been successively honoured with the preference of the Council. Leeds had previously received the society, in 1839—the only other place, with the exception of York, at which a second call has yet been made.

Encouraged by the gradually increasing strength of their catalogue, the council has now ventured on a two days' show, the meeting previous to last year having been confined to one. Wednesday—as we have already mentioned—was the first day, as far as the public generally were concerned; although the business really commenced some two or three days earlier. This indeed has been rendered necessary at all our agricultural gatherings of any importance, from the number of implements exhibited, and the trials required to prove their several merits. The county of York itself includes many firms justly celebrated for the skill and enterprise they have devoted to the improvement of agricultural machinery. At the head of these, on this occasion, came Crosskill of Beverley, and Busby of Newton, supported by other names more familiar to the north, as well as by some as well known throughout the kingdom. Amongst these latter who had secured stands were the Howards from Bedford, Garrett of Saxmundham, Hornsby from Grantham, Tuxford from Boston, Smith and Ashby from Stamford, Stanley from Peterborough, Clayton and Shuttleworth from Lincoln, Burgess and Key from London, Coleman from Chelmsford, Samuelson from Banbury, and Barnard and Bishop from Norwich. The prize-list subjoined will show the return made for the long distances many of these makers had travelled. In the different trials made, the chief interest was still centred in the reaping-machines, of which there was a very strong entry. These included Hussey's, Bell's, Hussey's improved, and M'Cormick's; Bell's, as brought out under the direction of Mr. Crosskill, further confirming that favour with which the north countrymen, more particularly, are inclined to regard it. The competition for the £25 prize for the best steam-engine was also very close—so much so, indeed, as to stay the judges from giving any preference between Messrs. Hornsby, and Clayton and Shuttleworth, whose firms accordingly divided the premium. As we have a friend who may favour us with a more detailed account of this part of the show-yard, we leave him and the prize-list to speak for themselves.

Some of these decisions—that on the steam engines amongst others—were not made until late on the Wednesday, while many classes of the cattle were inspected by the judges subsequent to the admission of the public. From ten to twelve, however, on this first day, was kept as something of a private view for members of the society and their friends; indeed, the day was altogether a select one, the ticket being half-a-crown, while for Thursday the entrance was only a shilling.

With, then, that now rare but very indispensable adjunct to sight-seeing, beautiful weather, the Yorkshire Society opened its yard on Wednesday last. The ground selected for the exhibition was that immediately in front of the County Asylum, flanked on one side by the city itself, and bounded on the other by the Scarborough Railway. It has been our lot to visit many displays of this character, but we must say we scarcely ever remember to have seen a yard so well laid out as this Yorkshire show of 'Fifty-three. Implements, cattle, horses, poultry, almost all arranged to the best advantage, and inspected with little of that crowding and discomfort—even

on the shilling day—that the agricultural enthusiast has too often to encounter. We only wish, in fact, some of the Council members of the Royal Agricultural Society would take a hint from the Yorkshiremen as to how they should exhibit their horses—the stallions more especially. Instead of being boxed up, with the heels of the animal coming into very close quarters with the limbs of the spectator, mark how these real lovers of horses manage it. In a series of paddocks, so divided by open rails that the visitor can easily pass from one to the other, are found the stallions of the different classes, each with his number in the catalogue fixed to the near side of his head, and led round in a circle, like race-horses before saddling, for the inspection of the public. It would be almost impossible to imagine a finer treat. Imagine some eighty or ninety horses just in that acmé of "show" condition a Yorkshireman knows so well how to put on; these divided according to their breeds or size for hunters, carriage-horses, roadsters, and cart-horses. Here, in the first class, comes round many a name found in another, but no less characteristic, pursuit of the Yorkshireman. The game, beautiful old St. Bennett, looking as fresh as if ready for another turn over Newcastle—the great almost overgrown Poynton, a wonderful specimen of the thorough-bred horse—the even-looking, good-going Era—the far-famed Don John, all the better in appearance for his return to the north; or the handsome, showy Ramadan, a son of the yet still "prettier" Beiram. Round they go; while we feel if these horses cannot get hunters, we do not know where to look for them. The other classes were perhaps even stronger, both in the number and merits of those shown. The first prize in the roadsters, a one-eyed horse, with white hind legs, called Prickwillow, was about as perfect a hack as ever was seen: while the cart stallions were, as a class, great powerful horses, with little or no lumber—clean heels, quick action, and altogether the best show of the sort we have ever seen. We are not "Yorkshire" ourselves, and so there may have been better, but we were quite satisfied. Our only wonder is that the horses of all these classes do not come more into competition under the auspices of the Royal Agricultural Society. It is well known this is about the weakest point in the exhibitions of the latter—it most assuredly was at Gloucester—while our friends in the north may do much to remedy it, if they only so choose. The mares and foals, with young horses, more particularly the hacks and hunters, also included some very clever animals. There were many certainly to pick out of, but few to cast any discredit on the fame of those districts they mostly come from. We saw but one Suffolk horse in the yard, and, to say the best for him, he was terribly out-voted.

After, or contemporary with the Yorkshire horse, comes the Yorkshire cow. Of either we expect to see something superior, and here again there was little cause for disappointment. The display of shorthorns much excelled the combined forces sent to Gloucester, heightened as they were here by Mr. Towneley's cows and heifers. This gentleman, with the Messrs. Booth, took nearly all the premiums in these, and they were far the best in the Shorthorn class, the yearling heifers and heifer calves being all commended. In the bulls it was satisfactory at least to see there could be no complaint or dispute as to the first prize. Lord Harewood's bull was a very superior animal; the others, taking the whole class, were, as we are told, scarcely up to the average of a Yorkshire show. Lord Berners' bull, that took the second prize, is the sire of the bull with which his lordship carried off the prize at the Gloucester meeting.

Of the sheep—Long-wools and Leicesters—we confess we had expected to see a somewhat better entry. Mr. Sandy, however, as one of the judges, was prevented from showing, and a Leicester class without him is just what a South Down one would be without Jonas Webb's name in it. The Downs are comparatively new to Yorkshire, although rapidly coming into favour for the hill districts. Some of the neatest here, however—and there were not many—came all the way from Norfolk. They were the property of Lord Walsingham, and if not so large as they are occasionally grown, had some of the best points of the Down character.

Of pigs, large and small, there was a very strong show, Lord Wealock's white pig having perhaps the best of it; though the larger sort were generally excellent. In horse-flesh, beef, and bacon, Yorkshire will be always hard to beat; many of the last-named were in fact shown as bacon. There were three or four boar pigs that, what with the heat and their preparation for the week, could scarcely have got alive out of the yard; indeed, a great many of the animals of all sorts—sheep, cattle, and pigs—were terribly overfed. There was no false delicacy as to exceeding the limit at York, and Mr. Towneley's fears must have quickly subsided.

However the poultry mania may fare elsewhere, it appears by no means to rage in Yorkshire. It was one of the weakest displays of the kind we have ever seen—that is, taking the whole strength of the several sorts and pens. The Cochin Chinas were very poor—bad in colour, and the old birds miserably out of all form. Of the Game and Spanish, on the other hand, there were a few good birds, as well as some nice varieties of the Bantam.

The business of the first day concluded with the Council Dinner, of which we borrow a report from a local contemporary. The dinner itself was a very good one, though, like Sancho's feast, somewhat of a difficulty when it came to the eating it. The waiters did their part in this; and the direction heightened it, by giving the bill of fare, every word of it, in French! This was certainly very genteel, but we saw more than one straightforward Yorkshireman terribly puzzled as to whether he should begin with "*à la purée de pois verts*" or "*consomme à la Printanière*"! The ecstacy with which one John Browdie-looking gentleman recognised a turbot, and defied all fashion forthwith by a holloa for "Loobster-sauce," in true Yorkshire brogue, was not the least treat on the occasion.

We find we have written the business of the first day as concluding with the dinner; but it did no such thing. After just the two loyal toasts from a very good chairman, and his own health from another noble lord, on came the discussion of the

evening. In the absence of Mr. Thompson, of Moat Hall, it was very ably opened by Mr. G. Legard. The subject, "Hand Tillage"—at least, as far as we could catch it—really resolved itself into one on the relative value of guano with other kinds of manure. This was well supported by Mr. Outhwaite, of Bainessee, Mr. Lister, Mr. Creyke, Sir John Johnstone, and others; the adulteration of guano being especially dwelt on, and with a clearness that ought to do much good.

We refer to the report, which will also in due time, no doubt, be given in the Journal of the Society—about the only thing, in fact, "The Journal" does give on its own responsibility. It appears to be conducted on the assumption that the Yorkshire farmers do not see the Journal of the Royal Agricultural Society, and hence the wholesale reprint of papers from it. We consider this neither fair to one body nor the other. While we see so much that we can honestly commend, we have the less hesitation in pointing out this one very weak feature in that otherwise-excellent institution—The Yorkshire Agricultural Society.

THE COUNCIL DINNER.

"THE BEST TIME AND MODE OF APPLICATION, IN DIFFERENT QUANTITIES, OF GUANO AND OTHER LAND TILLAGES TO GREEN AND CEREAL CROPS."

On Wednesday, Aug. 3, the Dinner took place at the Guildhall, Lord Hotham in the chair; supported by Lord Londesborough, the Lord Mayor, Sir Tatton Sykes, Sir J. V. Johnstone, Bart., M.P., E. S. Cayley, Esq., M.P., Sir W. P. Gallwey, Bart., M.P., J. G. Smyth, Esq., M.P., O. V. Harcourt, Esq., the Rev. Canon Gooch, &c., Mr. Ald. Anderson, Mr. Ald. Meek, and the Town Clerk, acted as Vice-Chairmen.

After the usual loyal toasts, Lord LONDESBOROUGH gave the health of the noble Chairman, who, after briefly returning thanks, called on Mr. Legard to give his opinion on "the best time and mode of application, in different quantities, of guano and other land tillages to green and cereal crops."

Mr. LEGARD said—Upon the scientific part of the question he should not venture to detain them; he did not feel quite competent to do so, and for his own part he did not think it would be altogether profitable to enter into the scientific question of the application of fertilizers, as such manures generally used may be called, to the land. He was inclined to think that scientific men were not quite united in opinion as to the chemical effects of those fertilizers on the land. From time to time they read in the various publications of the day of new discoveries in the application of various manures, and the mode in which they are applied; and these appear from scientific persons. No longer since than that morning he read a report in the *Mark Lane Express* of some experiments of the various nitrogenous matters upon different plants, from which it appeared that some new light was to be thrown upon the subject. Without, however, entering into mere matters of theory, he would notice some practical experiments of his own. This subject perhaps might be best divided into two parts. First, the sort of soils to which certain manures are most applicable, or rather that certain manures are most applicable to certain soils; and the other branch of the subject would probably be the time at which those manures could be most profitably applied. Before he ventured to detail certain experiments he himself had tried, he would first say a few words on the subject of soils. He had often thought it would be very desirable indeed if there could be some intelligible classification of soils, so that farmers might at once be enabled, by some easy test, to see and know the soil on which they were operating, and know the best, most convenient, and most economical farming on that soil, and the species of manure that would be best applicable to it. He was perfectly well aware that it had been tried to be done in various ways: several publications had appeared on this subject, and it has been thought that that classification might take place with reference to the geological condition of the land on which they were, and a good deal of benefit had arisen from this part of the question having been considered more than it was formerly considered. But it must be clear to all the practical men who were present that a great many of the soils in this country have no reference to the geological condition of the rock beneath: it was true enough that some were so—that some of the limestones, for instance, were dependent on the rock on which they rested; but a great many of the corn-growing soils are entirely independent of the rock on which they rest. The vale of York, on which they then were, was called the red sandstone; but, except in three or four limited places, such as the neighbourhood of Boroughbridge, Leeming-lane, &c., the soil had nothing whatever to do with the rock beneath. It is covered over with what is called in these days, drift. The surface soils of drift was what they had to do with, and it was this part of agriculture to which attention had been directed, so much so that able reports had been published in the "Journal of the Royal Agricultural Society" and other publications, some of which had been written by Mr. Trimmer. One of the material points in a discussion of this kind was the soils with which they had to deal. Perhaps they might venture on a sort of rude classification of soils in this way. He would confine himself to wheat-growing soils. He would call them the first class, the second class, and the third class wheat soils. Among the first class he would put the alluvial soils—rich soils, those formed from the deposit of rivers and estuaries. Other soils might be brought into the same class, perhaps the red marl, and it was open to gentlemen to consider what constituted these, but at any rate he thought the application of hand tillage to these sort of soils would hardly be considered profitable. He did not think that the application of manures in general use would be desirable on this class of soils. He would now pass on to the second-class soils—a very large tract of corn producing soils—among which he, perhaps, might mention the lime and chalk soils, the best gravel soils, and so on. If the four-shift of husbandry was pursued on this class of soils, and if turnips were eaten on, and so on, he did not believe that very much profit would accrue by using the description of manures they had in hand. If, however, the four-course system was departed from, if, as was not uncommon just now, a second crop of wheat were introduced into the course, as he himself had introduced it occasionally, then he believed that the application of these sort of manures would be most valuable. If there was a departure from the Norfolk or four-course system, he believed that very great advantage would accrue by the application either of guano or other manures which might be considered equally good; he had tried it himself, and with considerable effect. This species of fertiliser, it appeared to him, applied with greater benefit to the third-class, or worst description of soils, because they seemed to require a greater amount of food. He had for several years past occupied a farm containing not altogether, but partially, a soil which, he thought, might be considered one of the worst class of wheat soils. It is a porous chalky gravel; so porous and so bad is the gravel that a heavy

shower of rain washes the tillage away, and in a burning summer the crops are liable to be burnt up; but he had experimented on this species of soil for a few years past. Upon this kind of soil he tried an experiment with guano and nitrate of soda. The latter being a salt, is best used upon hungry land, but upon porous or light soils, a small quantity of nitrate of soda might be used with advantage. He would tell them what he had tried, in the way of manure, upon a crop of wheat. Between the 10th and the 20th April, he applied, on a part of a field, two cwt. of guano, and from two to four stones of nitrate of soda, and upon another part of the field, he applied 2¼ cwt. of guano, and no nitrate of soda; the cost of 2¼ cwt. of guano was 22s. 6d., and of the 2 cwt. of guano and the nitrate of soda, 18s. 6d., or 4s. less than the other. The result was this, the produce of the second part of the field, which cost only 18s. 6d. in guano and soda, produced three bushels of wheat more than the other, which, at 5s. a bushel, gave a profit of 15s. This was upon a poor porous soil. He tried the same experiment upon a portion of stronger soil, and the guano and soda produced no more than with the 2¼ cwt. of guano. Then he tried an experiment with guano and foldyard manure, made by oilcake. It had occasionally been the custom to use linseed cake on the farm he was speaking of, and in considerable quantities, and in the autumn he tries this, which he thought was the best sort of manure for this sort of land. But in 1847, he thought it was, they deemed it advisable to give up the use of oilcake manure and resort to guano, and he applied to 105 acres two cwt. of guano and two stones of nitrate of soda per acre, the cost being about the same as manure made by oil cake, but the produce was eight bushels per acre more than that which he had previously obtained by applying oil cake manure. Gentlemen would perhaps say, this was a marvellous thing; but so it was. He would mention but one other experiment, the application of guano to grass land, the experiment being tried with different kinds of manure upon the same kind of land, the farmyard manure used being made in the same way as oilcake manure generally was. This oilcake manure was applied in the autumn upon a piece of wold grass land of four years' standing, and which seemed to require something to set it a going. It was thought that the application of twelve tons per acre of good yard manure would do some good, and it did, but it was very little. Then he tried five hundred gallons per acre of liquid manure from the tank, and this had not any great effect; nothing, in fact, to what it ought to have. He next tried the experiment of dissolving three cwt. of guano in that quantity of liquid, for each acre; and in a very short time, almost in a few days, it produced a marvellous effect; where no white clover had grown before, white clover now sprung up. After this they were induced to go on, and tried five cwt. of guano, mixed with two stones of nitrate of soda, which the land had never since forgotten, and which, though once a piece of poor, was now a piece of very fair grass land. (Applause). He had nothing more to mention to them, but he hoped that some gentleman would be able to give them information derived from practical results. He was glad to observe in some newspaper, only the other day, that some new experiment had been made in manures, as he believed the discussion of the subject would be of the greatest advantage, not only to farmers, but also in a national point of view. (Applause).

Sir TATTON SYKES said he could not object to anything that had been said by Mr. Legard; but he had always been of opinion that they ought to use fold-yard manures, which would increase the quantity of soil on wold land. He had always found it advantageous to do this, even if manure was mixed with road scrapings or anything else, particularly on light soils.

Mr. CAYLEY, M.P., wished to ask Mr. Legard a question as regarded the experiment on grass land, whether he applied the fold-yard manure, the liquid manure, and the guano, on the same piece of land, the one being superadded to the other, or whether each application was to different pieces of the same kind of land.

Mr. LEGARD thought he had made himself understood, but what he meant was that fold yard manure was applied to one acre, the liquid manure to another, and the guano and nitrate of soda to another.

Mr. JNO. OUTHWAITE, of Baimesse, said, after the able manner in which this subject had been introduced by Mr. Legard, much was not left for any one else to say; but he should like to say a few words upon experiments he had made with artificial manures. He did not profess to be a chemist, but he should speak of results as he had found them when tested by practice. (Applause). Some years ago, he was in the habit of using a great deal of rape-dust, he having used in one year, on less than 500 acres of land, £268 worth of that kind of stuff—rape-cake ground up into dust. He found it to be very beneficial, and thought it might be used with advantage if it could be bought at a reasonable price; but lately rape-cake had been used a good deal for feeding cattle, and it had got too high in price to be used as manure, when grain was at so low a price. He tried it with good effect when wheat was selling at 7s. 6d. per bushel, as he found by expending at the rate of 30s. per acre in rape-dust, he obtained from 7 to 8 bushels per acre more, which was a practical result. He had also tried it upon green crops, but it was a complete failure; but grain crops were improved in quality by it. That was, the grain was better, though it did not add much to the straw. As to turnips, he thought there was a good deal depending on the way in which artificial manures were used. When he first began using guano, he lost many of his turnips, which did not come up at all. He obtained a drill, with a separation by a scraper between the seed and the artificial manure; but when he disturbed it in the same way as bone-dust, he found it destroyed a great portion of the seed. Finding this to be the case, he then commenced dredging it at the bottom of the rows; but this did not answer, as it was so long before it reached the small plants. In subsequent crops, he let a man sow it carelessly, as he would do grain, and by sprinkling it all over the dust stuck to the sides of the rows, and little bits fell to the bottom, in which way the small plants got hold of it. He had found this to be the most beneficial way for turnips. A deal had been said about the chemical part of the matter, and about people understanding whether land had too much or too little lime in it. This was a matter he did not understand, but his opinion was that there was a certain description of light soil for which bone manure answered perfectly well—as well as guano—and grew as good common turnips of all kinds, except Swedes. They were aware that bone manure was decomposed much sooner in light than in strong soil; so that if they applied bone manure in strong land it was not decomposed in time to be of use for the crop, therefore he did not recommend it for such soils, but on light soils it would answer well. On strong soil he recommended guano, but on light soil he preferred bones. Bones they might drill along with the seed, without affecting it. He had tried bones, and he was of opinion that as soon as they got it into dust they might drill it along with the seed. It was not, however, on the whole, so valuable as guano (applause). He had tried other kinds of manures, but he could not now go into them. Amongst others he had tried the desiccating manure, and found that it caused the plant to spring forward at the commencement, but it did not maintain the

growth throughout (Hear, hear). He had no doubt, in a country like this, in seasons similar to the present, during which they had been greatly annoyed with the turnip-fly, this manure would be valuable. The difficulty with which they had to contend with reference to this insect was its destruction of the plant in infancy, and he thought the tendency of this manure was to prevent such a result. He had also tried castor-oil cake for turnips: he had only used 11 cwt. this year, and at the present moment the turnips were looking well, and he had no doubt it would answer; but as he had not tried it previously he could not speak confidently. He had also employed fold-yard manure under hand tillage, which he believed to be best for all kinds of green crops, even for beans (for which he had tried it for several years), because beans were a thing which did not require to work upon a manure of small substance. For this description of crops he had found fold-yard manure the best he had tried for years (applause).

Mr. MATHEWS, of Driffield, thought the time had arrived when a manure could be manufactured as good as Peruvian guano, and not so expensive. He was manufacturing a manure called nitro-phosphate, and at the present moment there were not less than 1,000 experiments proceeding with it; and he, as well as some other gentlemen who had used it on turnips, was satisfied, judging from the appearance of the turnips, that they would be as good as when manured with Peruvian guano.

Sir JOHN JOHNSTONE drew the attention of Mr. Mathews to the fact, that the Royal Agricultural Society of England had offered a premium of £1,000 to any gentleman who should produce a manure equal to guano. If he understood Mr. Mathews right, it appeared that gentleman had succeeded in producing manure as effective as guano; and if that were so he was delighted to hear it, for nothing would give him greater satisfaction than that the Royal Agricultural Society of England should have to give the premium of £1,000 to a Yorkshireman (Hear, hear).

Mr. MATHEWS wished to call the attention of the meeting to the following extract from Professor Way, respecting soils where the digger had been used:—"The soil, when pulverized, will absorb ammonia from the atmosphere, during a winter's exposure, estimated to be equal to a dressing of 2 cwt. of guano." Such was the opinion of Professor Way, the chemist, he believed, of the Royal Agricultural Society, and he (Mr. Mathews) therefore thought that the digging machine would be of some service, by reducing the soil to a pulverised state, for ammonia possessed the most fertilizing properties of anything he knew at present.

Mr. LISTER, of Dunsay Bank, near Richmond, wished to say a few words upon the immense impositions which were practised upon the farmers of this country by parties selling things for guano, which were not worth the carriage (Hear, hear). The imposition in his own neighbourhood was very fearful. He lived near the river Tees, and he was credibly informed, by a gentleman present, that there was at present a continued manufacture on the banks of that river of the most rubbishly stuff, which was sold to the farmers in that neighbourhood as guano. Large quantities of this stuff was bought by the deluded class (a laugh). The gentleman who last spoke professed to sell a first-rate article; but he would advise all who purchased manures to consult Professor Way before doing so, and advised them to submit the manures to a chemical test before using them (Hear). This society could not do a wiser thing than to establish a chemist in York in connection with the society, whose duty should be, for a trifling charge, to analyze the various manures which were being sold (Hear, hear). As to the application of this manure to the land, in his opinion guano was pre-eminent above all, if of good quality (Hear). He would not say that bones might not answer very well, but he did think that there was nothing equal to guano, judging from his own experience. He also thought it was better for green crops than grain crops, because in the latter it went down in the straw rather than in the grain. With reference to the application of guano where the soil is ridged for turnips, it was desirable to prevent the artificial manure falling to the bottom of the furrows. Mr. Lister proceeded to observe, that in order to obviate this difficulty he had been in the habit of adopting a plan, the effect of which, after the manure had been put into the rows, had been, that the whole of the soil was pretty much in the same position as it was before the outstitching commenced. He, in fact, by a certain process, again levelled the soil after it had been stitched out, so that the farm-yard manure became so covered that no one could see it. Then the guano was sown, and the consequence was that, when the plough followed it, it threw the guano immediately underneath where the turnip was to be sown, but not so near the seed as to injure the root of the plant when the seed began to germinate. Thus far, then, he had done his best to explain a good and cheap method of dealing with the subject before them (Hear, hear). He would add a few more words. He had been much struck with the observations that had fallen from Mr. Legard in reference to the application of guano in a liquid state. They had had in the show-field, among other implements, a drill for the purpose, as he understood, of applying bone-dust mixed with sulphuric acid in a liquid. He had not read the experiments of Earl Ducie, but he had heard a great deal from the inventor of the implement he had alluded to, as to the advantages of applying manure in a liquid state; and, judging from the observations made by Mr. Legard upon the subject, he was inclined to think that that gentleman had hit upon the right plan, and that manure must be more effective if applied to land in a liquid state (Hear, hear). Further experience must decide this. In the meantime, he thanked them for the kind attention they had given to the remarks which it had struck him might be of some use in connection with the question which formed the subject of the present discussion (Applause).

After considerable discussion on the subject of the adulteration of manures,

R. CREYKE, Esq., of Rawcliffe Hall, advised farmers to purchase guano direct from Gibbs, and not to go for it to the Tees. At first, he said, guano was applied to all crops, green and cereal; and it was found, as Mr. Legard had observed, that it produced too much straw and too little wheat. In his neighbourhood, it was now applied to green crops and to potatoes. They did not apply it direct to the potatoes in the first instance. The guano was sown broadcast over the land. It was not applied direct to the potatoes; but as the rain fell the manure went to the potatoes, and they thereby obtained that fructification which they required. It was found that the guano might be efficaciously applied after the potatoes were up. When they were four or five inches from the ground, it might be sown broadcast; but it must not be applied to the potatoes themselves in the first instance, as it gave them too great a stimulus. The analyzation of guano, so as to discover whether or not it was genuine, was really a very simple process, and one which might be carried out in any village. There was a test which had been introduced by Professor Nesbit—namely, putting some of the guano in a bottle with a certain quantity of water, and then weighing it. This would give them an idea whether it was adulterated or not; and, if they found it was, they had better take it at once to an analytical chemist.

J. W. CHILDERS, Esq., said there was only one place that he knew of where farming was successfully carried on without

the application of manure at all. He alluded to a spot between London and Gravesend, where large crops of clover and wheat were grown, but where no manure had been used within the memory of man; on the contrary, the people stated that if they used manure it would spoil the crops. There was another circumstance to which he wished to refer. At Deptford there was an establishment, where the manufactory of stones into manure was carried on. These stones were found on the coast of Essex, and some parts of Suffolk. They were brought from those places to London, ground into manure, and afterwards sold extensively in Norfolk, and probably also in this county, at the rate of £5 per ton. This was one of the most efficacious kinds of manure that had been discovered, particularly for green crops, and also for corn.

Sir J. V. B. JOHNSTONE said there was another district of England where no manure was used, but still wheat crops were successfully grown. He referred to a place in Northamptonshire, near the Weedon station, which was well-worthy of being visited by any persons who were travelling that way. Mr. Matthews had made some observations with respect to the pulverization of the land, and the great advantages which were consequently obtained. This was a principle which was to a great extent carried out by Mr. Smith, at the place he had referred to. Mr. Smith was in the habit of growing wheat in alternate rows, without the application of manure; and his crops went on constantly increasing. This was a point well-worthy the attention of practical farmers. The manufacture of superphosphate from stones, which was carried on by Mr. Lawes, had been alluded to; and this gentleman's experiments were equally worthy of attention with those of Mr. Smith. In Mr. Smith's case, the plants were made to draw from the air that stimulation which in Mr. Lawe's they obtained from the superphosphate. Thus, two experiments were going an at the same time, by one of which the crops had been successfully grown without manure for the last ten or twelve years, by means of the pulverisation of the soil; and in the other by the application of superphosphate.

Mr. LISTER inquired why Sir John Johnstone had not followed out these wonderful experiments. It had been said that farmers did not go fast enough; but, according to this, he thought they were going a great deal too fast in spending large sums in manures, when it appeared that good crops could be grown without. (Laughter). These discussions were not intended so much to convey information to the well-educated class of farmers, as to guide the poor and illiterate farmer of this county; and therefore it was that he was desirous that every point raised in discussion should be thoroughly sifted to the bottom. (Hear). With regard to the adulteration of guano, he wished their members of Parliament would endeavour to make the offence a felony, and that, he conceived, would soon have the effect of putting an effectual check upon the practice. (Hear, hear).

Sir JOHN JOHNSTONE replied that he did not profess to be a practical farmer, but he had kept his attention alive to things passing around him, which had any relation to the cultivation of the soil and the improvement of crops. He had himself gone through a series of very elaborate experiments, the results of which he had published, and those experiments had led him to regard guano with very great favour as a hand tillage, but he did not think it was so advantageous when put on wheat in spring, as the straw grew too large, and the ears did not fill. He hoped that if any gentleman had any fact or any experiments to communicate, he would never shrink on these occasions from making them known, so that practical farmers might benefit from them, and follow them out if they were so disposed.

Mr. LEGARD, in conclusion, said there was one observation about alluvial soils which he wished to explain. He did not mean to say that the application of guano to alluvial soils was not attended with benefit—especially to green crops and potatoes—but what he did mean to say was, that it was not attended with such a large advantage in the growth of wheat on rich alluvial soils in the present state of knowledge of growing that grain. If by any means they could stiffen the straw, then, by the application of guano they could grow any quantity they liked. If they could not effect this, then the only result in applying guano to such alluvial soils, would be to get a great quantity of straw and very little corn. With potatoes and mangel wurzel, he thought guano might be applied with advantage. In conclusion, the speaker remarked that he was glad the discussion had brought out such really good information as they had derived from Sir J. Johnstone, Mr. Childers, and others, who, although not practical farmers themselves, carefully and minutely studied the effects of certain manures, and by publishing the result of their experiments, conferred great benefit upon the whole agricultural community. So far from wishing to depreciate the services of such gentlemen, he was desirous of expressing to them his very best thanks. (Hear, and cheers).

The CHAIRMAN afterwards gave the health of their most efficient secretary, Mr. M. M. Milburn, who briefly returned thanks, and the meeting broke up.

LIST OF PRIZES.

JUDGES.

FOR CATTLE.—Mr. Thomas Crofton, Holywell, Durham; Mr. R. Dudding, Panton; Mr. Joseph White, Esholt, Leeds.

SHEEP AND PIGS.—Mr. Torr, Aylesbury; Mr. Hobson, Kettleby; Mr. Thorp, Brigg; Mr. Sandy, Holme-Pierrepoint, Notts.

HORSES.—Mr. Nicholson, Stourton Grange, Leeds; Mr. T. Sowerby, Newton Morrell, Darlington; Mr. W. Uppleby, Bonby, Barton.

IMPLEMENTS.—Mr. J. Almack, Beverley; Mr. P. Stevenson, Rainton, Ripon; Mr. J. Brook, Wrangbrook; Mr. W. Hislop, Woolley, Wakefield; Mr. T. Scott, Brown Close, Ripon; C. E. Amos, Esq., Southwark, London.

CLASS 1.—For the best bull of any age, 1st prize, £25, Earl of Harewood; 2nd prize, £10, Lord Berners.

CLASS 2.—For the best yearling bull, 1st prize, £20, Mr. R. Booth, of Warlaby, Northallerton; 2nd prize, £5, F. G. Hawkes, Esq., Farnley Hall.

CLASS 3.—For the best bull calf, upwards of five months old, £10, Mr. C. Towneley, Towneley Park, Burnley.

CLASS 4.—For the best cow of any age, in calf or milk, 1st prize, £15, Mr. C. Towneley; 2nd prize, £5, Mr. R. Booth.

CLASS 5.—For the best three year old cow, in calf or milk, and having had a calf, first prize, £10, Mr. J. Booth, Killerby, Catterick; 2nd prize, £5, Mr. C. Towneley.

CLASS 6.—For the best two year old heifer, in calf, first prize, £10, Mr. R. Booth, Warlaby; 2nd prize, £5, Mr. C. Towneley.

CLASS 7.—For the best yearling heifer, 1st prize, £10, Mr. C. Towneley, Towneley Park, Burnley; 2nd prize, £5, Mr. C. Towneley.

CLASS 8.—For the best heifer calf, upwards of five months old, £5, Mr. C. Towneley.

CATTLE OF ANY BREED.

CLASS 9.—For the best cow for dairy purposes, £5, Mr. J. T. Robinson, Leckby Palace, Topcliffe.

CLASS 10.—For the best fat ox, under three years old, £5, Mr. G. Wentworth, Woolley Park, Wakefield.

CLASS 11.—For the best fat ox, upwards of three years old, £5, Earl Fitzwilliam.

CLASS 12.—For the best fat cow or heifer, of any age, £5, H. Ambler, Esq., Watkinson Hall, Halifax.

EXTRA STOCK.—CATTLE.

1st prize, C. Towneley, Esq., Towneley Park, Burnley; 2nd prize, C. Towneley, Esq.

LONG-WOOLLED SHEEP.

CLASS 13.—For the best shearling ram, not a Leicester, 1st prize, £15, Mr. J. Borton, Barton-le-Street, Malton; 2nd prize, £5, Mr. W. Abraham, Barnetby-le-wold.

CLASS 14.—For the best ram of any age, 1st prize, £10, Mr. J. Borton, Barton-le-Street, Malton; 2nd prize, £5, Mr. S. Wiley, Brandsby, York.

CLASS 15.—For the best pen of five ewes, £5, Mr. J. Simpson, Spofforth Park, Wetherby.

CLASS 16.—For the best pen of five shearling wethers, £5, Mr. G. Walmsley, Rudston, Bridlington.

CLASS 17.—For the best pen of five shearling gimmers, 1st prize, £10, Mr. G. Walmsley, Rudston, Bridlington; 2nd prize, £5, Mr. W. Jordan, Caythorpe, Bridlington.

LEICESTER SHEEP.

CLASS 18.—For the best shearling Leicester ram, 1st prize, £15, and 2nd prize, £5, Mr. A. Cowen, Sewerby, Bridlington.

SOUTHDOWN SHEEP.

CLASS 19.—For the best Southdown ram of any age, £10, Mr. G. S. Foljambe, Osberton.

CLASS 20.—For the best pen of five Southdown ewes, 1st prize, £5, Lord Walsingham, Merton Hall, Thetford, Norfolk; 2nd prize, Mr. J. Ellison; 3rd prize, Mr. J. Fullerton.

EXTRA STOCK—SHEEP.

The prizes to Mr. John Borton, Barton-le-Street, Malton; and Mr. H. V. Gratham.

PIGS.

CLASS 21.—For the best boar, large breed, 1st prize, £5, Mr. Thos. Horsfall, Burley Hall, Otley; 2nd prize, £3, Mr. R. Crossley, Newton, Manchester.

CLASS 22.—For the best sow, large breed, in pig or milk, 1st prize, £5, Mr. T. Craven, Manningham, Bradford; 2nd prize, £3, Mr. John Seagrove, Oatlands, Leeds.

CLASS 23.—For the best boar, small breed, 1st prize, £5, Mr. Geo. Mangles, Givendale, Ripon; 2nd prize, £3, Mr. E. Akroyd, Denton Park, Otley.

CLASS 24.—For the best sow, small breed, in pig or milk, 1st prize, £5, Mr. E. Akroyd, Denton Park, Otley; 2nd prize, £3, Mr. G. Mangles.

CLASS 25.—For the best three store pigs, of the same litter, from four to nine months old, 1st prize, £5, and 2nd prize, £2, Mr. S. Wiley, Bransby.

CLASS 26.—For the best sow of any breed not qualified to compete in classes 22 or 24, £5, Mr. T. Horsfall, Burley Hall, Otley.

EXTRA STOCK—PIGS.

The prizes to Mr. S. Wiley, Brandsby, York, for two boar pigs; and Mr. G. Hutchinson, Prospect House, York, for sow and ten pigs.

HORSES.

CLASS 27.—Best stallion for hunters, 1st prize, £10, Hepworth and Wilson, Langrick Ferry, Selby; second prize, £3, Mr. H. Scott Waring, Darlington.

CLASS 28.—Best stallion for coach horses, 1st prize, £10, Thos. Denby, Rawcliffe, Selby; 2nd prize, £3, William Burton, Water Fulford, York.

CLASS 29.—Best stallion for roadsters, 1st prize, £10, Mr. Wm. Weatherill, West Collingwith; 2nd prize, £3, R. B. Ridsdale, Watergate, Ripley.

CLASS 30.—Best stallion for agricultural purposes, 1st prize, £10, J. Stockdale, Hutton Cranswick, Driffield; 2nd prize, £3, R. Emsby, Mackington, Ripon.

CLASS 31.—Best mare and foal for hunting, £5, Mr. Stephen Kirby, Thirsk.

CLASS 32.—Best mare and foal for coaching, £5, Mr. T. Dickinson, Bishops Wilton, Pocklington.

CLASS 33.—Best roadster mare and foal, £5, Mr. George Smith, Ellerton, Rubwith.

CLASS 34.—Best mare and foal for agricultural purposes, £5, Mr. M. Tomlinson, East Dike, Tadcaster.

CLASS 35.—Best 3-year-old hunting gelding, £5, Mr. R. Johnson, Frodingham, Driffield.

CLASS 36.—Best 3-year-old hunting filly, £5, Mr. C. Pybus, Catterick.

CLASS 37.—Best 3-year-old coaching gelding, £5, Mr. Lumley Hodgson, Highthorne.

CLASS 38.—Best 3-year-old coaching filly, £5, Mr. J. Bland, Oversilton.

CLASS 39.—Best 2-year-old coaching gelding, £5, Mr. T. Dewse, Steeton.

CLASS 40.—Best 2-year-old coaching filly, £5, Mr. J. Ellis, York.

CLASS 41.—Best 3-year-old hackney gelding or filly, £5, Mr. R. Owston, Brigg.

CLASS 42.—Best hackney mare or gelding, £5, Mr. Hodgson.

CLASS 43.—Best pair of horses for agricultural purposes, worked during the season, £5, Mr. Simpson.

CLASS 44.—Best 2-year-old agricultural gelding or filly, £5, Mr. Batty.

EXTRA STOCK.—HORSES.

Medals to Mr. Denby, Rawcliffe, and to Mr. Hall, Scarborough.

AWARD OF IMPLEMENT PRIZES.

Plough to plough 5 inches deep, £5, Mr. J. Palmer, of Stockton-upon-Tees.

Ditto, seven inches, £5, Messrs. Howard, of Bedford; second, £2, Mr. J. Barker, Dunnington.

Ditto, nine inches, £5, Mr. W. Busby, of Newton, Bedale; and Mr. Meynell's plough for general purposes commended.

Heavy harrow, £3, Mr. B. Stead, of Barnsley.

Light harrow, £3, Messrs. Howard.

Horse-hoe on the flat, £5, Messrs. Garrett.

Horse-hoe on the ridge, £2, Mr. Wm. Busby. Messrs. Hill and Co.'s commended for one with a scissor motion.

Corn drill, £5, Messrs. Garrett.

Turnip drill, £5, Mr. Hornsby.

Manure distributor, £5, Messrs. Garrett.

Liquid drill, £5 5s, Mr. J. Kemp. With this machine were shown four specimens of turnips, three grown with liquid manure, and the fourth with bone-dust; exhibiting the benefits arising from the application of manure in a liquid state.

Grubber or scarifier, £5, Mr. H. Kearsly, Ripon.

Broadshare or scarifier, belonging to Mr. Bentall, commended.

Scarifier, belonging to Messrs. Hill and Co., commended for uneven surfaces.

Horse rake, belonging to Messrs. Howard, highly commended.

Haymakers, belonging to Messrs. Smith and Ashby, commended.

Digging machine, £5 5s., Mr. B. Samuelson.

Clod crusher, belonging to Mr. Crosskill, Beverley, commended for self-cleansing principle.

Dynamometer, £5 5s., Mr. H. Bentall.

Roller, belonging to Messrs. Gibson and Son, commended.

Mr. Crosskill, for "Bell's Reaper," £10, and the society's gold medal.

Roller, Messrs. Gibson and Son, commended.

Thrashing machine, with dressing apparatus, £20, Mr. Hart, of Wantage, Berkshire.

Waggons, £3, Mr. Crosskill.

Single horse cart, £5, Mr. Crosskill.

Chaff-cutter, £5, Messrs. Richmond and Chandler, Manchester and Liverpool.

Turnip-cutter, medal, Messrs. Kealey and Co., London.

Cake-crusher, £1, Messrs. Hornsby and Son, Grantham.

Mortising machine, £2, Mr. Wm. Coulson, York.

Feld-rakes (tubular), 10s., Mr. Stanley, Peterborough.

Horse-hoe, £1, Mr. W. Smith, of Kettering, Northamptonshire.

New bean-cutter, medal, Mr. Wm. Dove, York.

Self hicking barrow, £1, Mr. John Naylor, of Winterton, Brigg.

Cooking apparatus, 10s., Mr. Wakefield, of Mansfield.

Small tools, £1, Mr. W. Dove, of York.

Model of a new rotary steam engine, medal, Mr. George Locking, of Hull.

The steam-engine prize of £25 was equally divided between Messrs. Clayton, Shuttleworth, and Co., of Lincoln, and Messrs. Hornsby and Son, Grantham.

The number of persons who visited the agricultural show on Wednesday was between 3000 and 4000, and on Thursday between 16,000 and 17,000; making a total, in round numbers, of at least 20,000 people. [illegible]

for admission were as follows:—On Tuesday, £23 14s.; on Wednesday, £283 10s.; and on Thursday, £756 13s.; making a total of £1,063 17s. The entire sum which the Yorkshire Society has derived from the present York meeting, including the public subscription of £300, is £1,363 17s.!

Amongst the interesting proceedings of the Yorkshire Agricultural Society, we always number the discussion at the council dinners. The one which took place this year at York, on the best mode and time of applying guano and other hand tillages to green and cereal crops, had hardly any of those novelties which often arise in discussions of this nature, and the difficult and almost irreconcilable experiments which were detailed at the meeting showed how little we appear to know, and how much remains to be learnt on the operation of these manures. We have hinted at these difficulties and irreconcilable principles over and over again; and Mr. Legard, who in the unavoidable absence of Mr. Thompson, took up the subject almost without notice, and thus alluded to our article of the last week but one:—

"He was inclined to think that scientific men were not quite united in opinion as to the chemical effects of those fertilizers on the land. From time to time they read in the various publications of the day of new discoveries in the application of various manures, and the mode in which they are applied, and these appear from scientific persons. No longer since than that morning he read a report in the *Mark Lane Express* of some experiments of the various nitrogenous matters upon different plants, from which it appeared that some new light was to be thrown upon the subject."

Alluding to the classes of soils to which guano is applicable, Mr. Legard divides them into, first, the alluvial, or the soils deposited by rivers, on which he did not think the application of hand tillage advantageous in general cultivation. The second class were the lime, the chalk, and the best gravel soils; and on these he imagined, after they were once put under the four-course shift, with turnips and seeds eaten on, he did not believe very much good would result from the application of hand tillage, because the rotation on such soils would be self-sustaining. The third class he made out to be very poor clay, and other hungry soils, on which the application might be made to advantage. Guano and hand tillage, therefore, were just the most beneficial on those soils which were most in want of their use. There may be doubts, however, whether the second class also may not be vastly benefited by the application of light or hand tillage.

We quite agree with Mr. Legard, that when almost any description of land is put first under the four-course system, it will be self-sustaining, if proper quantities of animals are fed in proportion to those bred on the farm, whether the land is newly taken out of grass, recently drained, or even when it is first reclaimed. But let the four-course go on for several years on a soil very open and porous, and we shall soon find the crops get less and less productive. The land will refuse its modicum of wheat; the clover will become sick, and get thin; the turnips will take fingers and toes, and similar diseases; the soil will get shallower, and a moorband pan will form under the line of the plough-sole, and all these will make thin crops and poor returns, and it will be found necessary to give such soils a few green crops in addition to the fifty per cent. which that system requires. Either this, or an extra manuring and a change of crop, is necessary to keep up the fertility of the land. This is our own experience after many trials, and the Duke of Portland has, we believe, arrived at the same conclusion. Modifications of four-course husbandry are absolutely necessary to carry it out, and for this extra or light manures are indispensable.

Mr. Legard thus describes his experiments, and leaves them to form the basis of the discussion. The soil selected was described as a porous chalky gravel, so porous and so bad that the rain washes out the manures, and the crops are burnt up in a hot summer.

"Upon this kind of soil he tried an experiment with guano and nitrate of soda. The latter being a salt, is best used upon hungry land, but upon porous or light soils a small quantity of nitrate of soda might be used with advantage. He would tell them what he had tried, in the way of manure, upon a crop of wheat. Between the 10th and the 20th of April, he applied on a part of a field 2 cwt. of guano, and from 2 to 4 stones of nitrate of soda, and upon another part of the field he applied 2¼ cwt. of guano, and no nitrate of soda; the cost of 2¼ cwt. of guano was 22s. 6d., and of the 2 cwt. of guano and the nitrate of soda 18s. 6d., or 4s. less than the other. The result was this, the produce of the second part of the field, which cost only 18s. 6d. in guano and soda, produced three bushels of wheat more than the other, which, at 5s. a bushel, gave a profit of 15s. This was upon a poor porous soil. He tried the same experiment upon a portion of stronger soil, and the guano and soda produced no more than with the 2¼ cwt. of guano."

Here the guano and soda produced more results, at less cost, than the larger quantity of guano; and in the other case, on a different soil, the result was that there was no difference. It is not at all improbable that solubility was the real cause of difference. The guano was likely to be carried off almost entirely to the phosphates by the first rain; the nitrate of soda, though very soluble, would dissolve in a more gradual manner, and as April was perhaps too late for the phosphoric matter to be of much use to the crop, the nitrogenous was all that could be depended upon for assisting the crop.

He went on:—"Then he tried an experiment with guano and fold-yard manure, made by oilcake. It had occasionally been the custom to use linseed cake on the farm he was speaking of, and in considerable quantities, and in the autumn he tried this, which he thought was the best sort of manure for this sort of land. But in 1847, he thought it was, they deemed it advisable to give up the use of oilcake manure and resort to guano, and he applied to 106 acres, two cwt. of guano and two stones of nitrate of soda per acre, the cost being about the same as manure made by oilcake, but the produce was eight bushels per acre more than that which he had previously obtained by applying oilcake

manure. Gentlemen would perhaps say, this was a marvellous thing, but so it was."

Now this is just the reverse of what many persons would expect, and certainly what they had a right to anticipate. The use of oilcake is always a source of great fertility to the land. In the wolds of Lincolnshire, it is the staple of manure, as it will never repay for the amount of food it lays upon the stock. If guano at a less cost, or guano and soda, will accomplish anything like, in other cases, what Mr. Legard's experiments, in the year 1847 indicate, it seems to be vastly against the application of cake.

But we are by no means satisfied with one year's trial of any one plan. The season may easily modify the application, so as to render any individual trial unworthy of general adoption because generally unsafe. But if experience deemed this to be generally true, it is quite clear the practice of our best farmers is far from economical. Mr. Legard, however, gives another exposition of the same fact, which the practical farmers will do well to consider and repeat; it is indeed, the most worthy of attention of anything we have seen.

He said:—"He would mention but one other experiment, the application of guano to grass land; the experiment being tried with different kinds of manure upon the same kind of land, the farm-yard manure used being made in the same way as oilcake manure generally was. This oilcake manure was applied in the autumn upon a piece of wold grass-land of four years' standing, and which seemed to require something to set it a going. It was thought that the application of twelve tons per acre of good yard manure would do some good, and it did; but it was very little. Then he tried five hundred gallons per acre of liquid manure from the tank, and this had not any great effect—nothing, in fact, to what it ought to have. He next tried the experiment of dissolving three cwt. of guano in that quantity of liquid, for each acre; and in a short time, almost in a few days, it produced a marvellous effect; where no white clover had grown before, white clover now sprung up. After this they were induced to go on, and tried five cwt. of guano, mixed with two stones of nitrate of soda, which the land had never since forgotten, and which, though once a piece of poor, was now a piece of very fair grass land."

Twelve tons of cake-made fold-yard manure producing little effect is certainly what we are not quite prepared for; but we imagine that the manure was, after all, trodden down, and had very few cattle fed on it, and these few depending mainly on the cake; in other words, each ton of manure could represent but a small quantity of cake, for we know of no better plan of improving poor grass land than by feeding sheep upon it with linseed cake. The result is astonishing, and while feeding the same sheep with turnips will do very little good; this will give the grass an impetus it will never forget.

We are not surprised at the non-effect of liquid manure. Farmyard drainage is too weak to be of great use beyond being absorbed by composts, and so applied in a more concentrated form than it can be in the state of liquid. We think Mr. Legard has furnished, in his speech, vast elements for future research and grave consideration.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

REVIEW OF THE IMPLEMENT EXHIBITION AT GLOUCESTER.

As is well known, this department of the Show included a most numerous collection, and covered a large portion of the enclosed yard. Such an overflowing abundance of invention for the use of the farmer, quite puzzles him what to adopt or reject from the extensive and varied list presented to his view. It would be tedious to number the various implements, and almost beyond power to name them. Every year produces something new, or old articles in a different dress and altered form. Smith and Garrett with corn drills, Hornsby with drop and coulter drills, Crosskill with rolls, wheels, and carts, Ransome and Sims, Dean and Dray with their varied collection, have all this year supported their former reputations. Howard and Busby were equally forward with ploughs; and a number of less known exhibitors filled a back ground of scarcely inferior reputation. Tools for the field, implements for the dairy, ovens for the kitchen, were not scarce, and many similar articles for like purposes; chaff cutters, crushing-mills, grinding-cylinders, and hand-machines quite equal the usual number, or rather increase. Draining-tile making machines have been much superseded by travelling steam engines for thrashing grain, and some new things have also crept forward. As we propose dealing at some length with the many varieties of agricultural machinery here exhibited, we may without further preface proceed to our classification of them—commencing, by every proper rule of etiquette, with that first symbol of rural pursuits—

THE PLOUGH.

There was a large selection, made from all the exhibitors' stands, which were first sent to the light land—a piece of clover root well adapted for the purpose; but before many furrows were drawn, the superiority became so evidently in favour of those of Busby, Ball, Messrs. Ransome and Sims, Howard, and Williams, that all the others declined proceeding with their lots, leaving the Judges no easy task to select the best out of these five; however, after applying the test of Bentall's unerring dynamometer, the palm of merit was in favour of Mr. Busby's plough.

The same five ploughs were then sent to the strong land, where they all performed in admirable style; but the work done by Mr. Balls's plough was so far superior to that of all the others, that although his was the second heaviest draught, the palm of merit was awarded to it

because of the extraordinary perfection of the plough's work when put to seven inches deep; indeed we must confess that we were more than pleased with the most inferior work done by the ploughs of any of these five champion makers.

For the prize awarded by the Society to the best turn-wrest or one-way plough, the competition was between Comins, Messrs. Ransome and Sims, and Messrs. Dray and Co.'s American plough. In this class the work was very inferior to any done by the former class of ploughs; but that by Lowcock's plough, made by Messrs. Ransome and Sims, was the best, and therefore awarded the prize. Mr. Comins's plough did its work tolerably well, and is both light and simple in construction, which we have no doubt called forth the commendations of the Judges. This could also be used as a moulding plough by the most simple contrivance. The work of the American proved that it was only calculated for stirring fallows, or ploughing up turnip land for the barley or other grain crop that is to follow. It is seldom desirable to have furrows, and we are of opinion that in this age of draining they ought to be with all possible speed done away with, in order to make way for the free and easy use of all the other great labour, manure, and seed-saving implements required to meet the various exigencies of the British farmer; indeed the day cannot be far distant when no man will be acknowledged as a first-class farmer who tolerates furrows on anything lighter than plastic clay.

PARING PLOUGHS.

The competition in this class was between Glover's well-known implement and Comins's; but we regret that Mr. Harkness's potato-lifting and paring plough was not selected for trial, as we think the revolving root-raisers attached to his plough would have proved their value to be great in the eradicating of all sorts of root-weeds, as well as pulverizing of the thin strata of soil moved—thus ensuring the quick vegetation of all seeds shed upon the land, the destruction of which is the chief element in perfectly good farming. After a good trial, the prize was easily won by Glover's plough.

OF DIGGING, OR RATHER FORKING MACHINES,

there were two — Samuelson's of Banbury, and Whitehead's, invented by Mr. Henry Bleasdale, of Chipping, Lancashire. Both of these machines are alike in their digging, or rather forking parts, but widely different in their cleaning apparatus; Mr. Samuelson's having peculiar sort of scrapers that are worked betwixt each series of revolving spikes; while Mr. Bleasdale's had, instead of scrapers, a series of revolving forks that rotate in the opposite direction of the digging-forks—an excellent contrivance; and one which we think will ultimately prove to be the best system. But Mr. Samuelson's steel forks must always be better than iron ones; the form of his spikes, too, are much better; which, combined with the weight of his machine, gave it great advantages over the other, and it was therefore awarded the silver medal.

For the best subsoil pulverizer, a prize of £5.—There was close competition for this prize between Howard, Read's subsoil plough, Gray (of Uddington, near Glasgow), Bentall (Essex), and Howard's improvement upon Mr. Gray's plough. This last, after careful trial, was awarded the prize. This implement executed its work with great ease to the horses, as well as in the most efficient manner; and thus deservedly carried off the prize.

For the best set of heavy harrows a prize of £5.—There was a large number set to work, but the competition was soon reduced to those of Messrs. Howard, and Williams, both of Bedford. After a close contest on a variety of soils, Mr. Williams was awarded the prize, and Messrs. Howard commended. It appears clear to us that these harrows will soon become universally used throughout the kingdom, as the greater part of those brought forward for trial were copies of Mr. Williams'.

For the best set of light harrows a prize of £5.—The competition for this was numerous, but soon (like the former) got reduced between the Bedford champions. After a severe trial the judges were able to award the palm of merit to Messrs. Howard, while they commended those of Mr. Williams.

For the best cultivator, grubber, and scarifier, a prize of £10.—For this prize there was a large number of implements tried, but it was not long before the competition was seen to be between Messrs. Ransome and Sims', Biddell, Coleman, Crosskill, with his Ducie drag, Hart of Berkshire, Busby's two-horse grubber and Wood of Stowmarket. After a severe trial of these as cultivators, in which there was very close competition—indeed it would have been a difficult task for the judges to have decided which was the best; but when they were applied as broadshares or scarifiers, Messrs. Ransome and Sims, as usual, with their Biddell, won so cleverly that the prize was awarded to their implement. Coleman, of Chelmsford, was commended for the efficiency of the work done by his four-horse grubber, it being the best adapted for high-ridged land; Mr. Hart's two-horse grubber was also commended; while the prize of £5 for the best two-horse grubber was, after close competition, carried off by Mr. Coleman.

For the best Drill for General Purposes the competition was close between Hornsby of Grantham, Garrett and Son of Saxmundham, and Smith and Sons of Peasenhall. All of these worked with the greatest precision in every department, giving the judges no simple task to find to whom the palm of merit was to be given. After careful trial of their working powers, and inspection of the mechanism of each, they awarded the prize of £10 to Messrs. Garrett of Saxmundham, and highly commended that of Messrs. Hornsby and Son. We were much pleased with a simple and efficient drill, invented by Mr. George Bell, of Inchmichael, Perthshire. This drill, in addition to drilling manure, grain, and clover or other grass seed, covered the seed and rolled the land, thus leaving a beautifully finished surface; owing, however, to its being made upon a stiff frame, it was ill adapted for the rough farming of many districts. This drill could be easily altered to sow turnips or mangel wurzel, either on the ridge or flat, at any distance between the rows.

For the best Steerage Drill for Sowing Corn or Turnip, there was a large number selected for trial; but we were surprised to find that the Bedford Steerage Drill on Hensman and Son's stand was not taken out. We rather regretted this, seeing that this drill is esteemed so highly on the light and hilly lands of the midland counties, where it is fast displacing the Suffolk Drill. It has a self-adjusting power, so as to prevent the irregular distribution of the seed in ascending and descending hills, which is of great value. After a trial Messrs. Hornsby's, Garrett's, and Smith of Peasenhall's were brought to another close contest, all working beautifully; but as the steerage of Hornsby's was much superior to either of the others, the prize of £10 was awarded to him for the best steerage drill—Mr. Garrett's highly commended.

For the best Small Occupation Drill the competition was between Messrs. Hornsby, Garrett, Smith, and Marychurch, whose drills all work in the most satisfactory way; while the mechanical details that worked out the sound principles laid down to accomplish the end desired were beautifully simple in each, and we are of

opinion that it became more a matter of price than anything else as to which was the best, all being so good. The prize of £5 was awarded to Messrs. Smith and Sons, of Peasenhall, who also received high commendation from the judges for the simplicity and cheapness of their drills; that of Messrs. Marychurch, of Pembrokeshire, was highly commended, and Messrs. Garrett and Son's commended.

For the best and most economical Small Occupation Seed and Manure Drill for Flat or Ridge Work. Messrs. Smith, Hornsby, Garrett, and Gower and Son, of Drayton, Shropshire, came into competition, each doing their work well; Messrs. Garrett receiving the prize of £5.

For the best Turnip and Mangel Wurzel Drill on the Flat the competition was again between Garrett, Hornsby, and Smith, and again they proved themselves makers of efficient implements. After a long and close contest the prize was awarded to Messrs. Garrett and Son, and Messrs. Hornsby and Son were highly commended.

For the best Drill on the Ridge we had again the three champion drill makers in the field, closely contesting for the prize of £10, which was, after strict mechanical scrutiny and trial, awarded to Messrs. Hornsby and Son.

Messrs. Garrett were highly commended for their combined sowing and seed drilling machine. This is a most simple and efficient implement.

For the best Dropping Machine for Seed and Manure the competition was between Messrs. Hornsby, Garrett, and William East, of Spalding, Lincolnshire. After trial and deliberate consideration the prize of £10 was awarded to Garrett, and Mr. East's machine highly commended. The simplicity of construction and accuracy with which all these machines worked does honour to the mechanical talents of their inventors.

We were not present at the trial of the Manure Distributors, but found by enquiry that Messrs. Garrett had again carried away the £10 prize, while Messrs. Holmes and Son were highly commended for their machine.

For the best Horse Hoe on the Flat there was this year more than usual competition. Williams, of Bedford, brought forward a universal horse hoe, invented by Mr. Robert H. Nicholls, of Bedford; Smith, of Kettering, Northamptonshire, his simple implement; and Messrs. Garrett their well-known horse hoe. After a fair and careful trial it was proved that Messrs. Garrett's implement still remains unrivalled. Mr. Nicholls' horse hoe is grounded on good principles of steerage, and has also a simple and efficient mode of attaching the shafts with joints that prevent the oscillating motion given to the shafts by the horse at every step from being communicated to the implement; this ensures great steadiness of action while at work, as well as enlarges the power of steerage: but still the machine fails to accommodate itself to the vertical inequalities of the land, while Garrett's does so with great precision. This made the adjudication an easy matter for the judges, who accordingly awarded Messrs. Garrett the prize of £5, while we certainly expected the judges would have commended Mr. Nicholls' implement for the simple and ingenious contrivance he has used to improve the steerage, some parts of which might be of great value to Mr. Garrett's horse hoe.

Two horse hoes, made specially for the purpose of thinning turnips, were tried; but Mr. Martin's, of Barmer, Fakenham, Norfolk, was the only one that answered the purpose on both the ridge and the flat. This machine is on perfectly the same principle as its competitors, invented and made by Mr. T. Huckvale, of Chipping Norton, Oxfordshire, who received a prize of £3 at the Liverpool Show, in 1841, for his simple and efficient little implement. This does one ridge at a time, both hoeing each side of the drill and leaving the crop thinned out to bunches at any required distance apart. It would be a simple matter to make this implement do two ridges at a time, as well as two drills on the flat; but as Mr. Garrett's horse hoe would be difficult to beat at thinning out the turnips into bunches on flat drilling, and as we have used his horse hoe for thinning out turnips on the flat for several years, we can speak with confidence of its efficiency when the plants are regularly distributed along the row—thus insuring there being a plant or plants left in the part of the drill missed by the hoes. We always used this implement by guiding it at an angle of forty-five degrees across the drills, by which we obtained the perfection of thinning—namely, that the plants in each drill were left opposite the space between the plants on the drill on both sides, thus allowing the air the freest action, and the plants the greatest space both for foliage and roots, without injuring each other. We hope our readers will pardon this digression.

The judges tried Garrett's hoe against Martin's, with the following result:—

Mr. Garrett's horse hoe was adjusted so as to cut ten inches and leave two, as nearly as we could tell; thus it left two inches of each drill undisturbed, and so did not destroy the plants growing on the space. In this case the judges had it worked at right angles to the drills, by driving across the field. Owing to the braird of turnips being thin and gapy, the spaces left frequently had no plants on them, while the hoes on each side of such spaces had cut up some plants; thus proving that to use machinery great regularity is required, in this as in all other cases.

Mr. Martin's implement was then tried. This machine, like Mr. Huckvale's, works along the drills and cuts any required space, leaving from about an inch to three inches (as required) of the row uninjured; this was accomplished by revolving hoes, which worked very well, but, like Mr. Garrett's, made mistakes where the crop was irregular or gapy. This implement did not cut up the weeds on each side of the plants, but we see no reason why it should not be made to do so. There is great merit due to Mr. Martin for bringing before the farmers again the revolving horse hoe, and that with much improvement, so that it can be used either on flat or ridge work; we are therefore pleased to find that a silver medal was awarded for this implement.

Mr. Huckvale's little revolving horse hoe was tried on some ridges without any crop growing, and appeared to work nicely, doing one ridge at a time, cutting up all the ground on both sides of the row.

For the best Horse Hoe on the Ridge there was extensive competition, at least as regards numbers; but as a large proportion of them were mere copies of Busby's, the number of different sorts was not great, each of them being useful and efficient as scarifying horse hoes, while some of them could conveniently be altered into five-coultered ridge grubbers—as was the case in that exhibited by Messrs. E. Hill and Co., of Brierly Hill. This had also a simple and most excellent contrivance for altering the width of the hoes instantaneously while the hoe progressed which called forth the commendation of the judges.

Busby's horse hoe was also commended for the efficiency of its working; while the prize of £10 was awarded to Howard, of Bedford, for their implement, which was a Busby's horse hoe with two wheels in front, about two feet apart, thus enabling the man to steer it with greater accuracy between the rows.

There were several Norwegian Harrows taken to the

field for trial, three of which got broken in attempting to prepare a piece of strong land that sheep had been folded on, to eat off a heavy crop of tares, which set the land, making it plough up close and stiff. Mr. Crosskill's man then started his Norwegian harrow, which, going after Mr. Colman's four-horse grubber, reduced the land into a beautiful state for drilling. After that it was tried on a rougher piece by the judges, who, as there was no prize offered, could only give high commendation for the excellency of its work. Indeed, no strong-land farmer should be without it. This implement has been greatly improved since last year.

For the best Mowing Machine for Natural and Artificial Grasses there were four competitors, Messrs. Hussey, M'Cormick, Garrett, and Crosskill. These were all taken first to a field of natural meadow, where Mr. Hussey first started, and cut all round a piece allotted to him; he went on cutting tolerably well until the rapidity of the pace at which the horses were driven shook some part of the machine out of place, when he gave it up, and brought another machine, that did not, however, do so well.

Mr. M'Cormick next started, and went on cutting in a most masterly way, except at turning the corners, where the driver frequently turned too short and ran the machine over the standing crop; this was not the fault of the machine, as it was afterwards greatly mended, when the horses and the driver got used to their business; in fact the work done by this machine satisfied the large majority of those present. And it was shown that where the crop was the longest it cut the best; so that we are of opinion that for cutting water-meadows, and others that are stocked with strong-stemmed grasses, this machine would meet any want there might be in a supply of labourers.

Mr. Garrett's machine then started, when the noise of the machinery frightened the horses and made them run away with the machine—which put a stop to its trial, as some slight matter got deranged, and time could not be given for repairing it.

Mr. Crosskill's machine was next put to work; this machine went on cutting very well, taking six feet wide, and leaving the cut crop all lying where it had grown. This has some capital principles about it for getting over high back lands, which it does very well indeed. Like Bell's reaping machine, it is propelled by the horses behind it; but it has a swivel-wheel that acts like the helm of a ship for steering and turning the machine at the ends. This last part of the machine was acted upon by a lever worked by the driver, who stands or sits immediately behind the horses and over the said wheel. As this wheel had not sufficient power to turn the machine at the ends, when the horses were not accustomed to the work, and would not give it all the aid possible, there was some of the best amusement at the upper end of the field that ever was exhibited at this or any other show. Indeed, we are of opinion, if laughter is a cure for any malady, those afflicted should get this machine, and put two awkward horses to propel it, and a fat charioteer to manage it—make him drive close up to a hedge with the machine, and give orders for the right or left, either of which will be sure to excite sufficient laughter to either kill or cure. One of the chief managers of the show enjoyed it to such an extent that he has not since been able to perform any action without either smiling or laughing. We are sure the visitors were amply repaid all trouble and expense by the sight. We must not, however, forget that this machine can cut in a superior style, and the meed of merit lay between it and M'Cormick's; but as it was not so manageable, Mr. Crosskill at once told the judges he would not take up their valuable time with any further trial, as he admitted the superiority of M'Cormick's machine as to its present means of management. We would like to have seen these machines taken into a field of clover in a fair state for cutting, as we feel satisfied that they would have done equally well there; but the managers of that department, in their ardour to get and keep right, overshot the mark, inasmuch as they obtained a piece of clover that was perhaps the heaviest in the kingdom, growing on land farmed in high ridges and deep furrow. Besides, the crop, from being left too long before cutting, had got quite matted to the ground, and, from its weight, had been laid down first across the ridges, then another growth along the ridges, while a third growth was standing apparently at the full height of the crop—in fact, it was the greatest puzzle to human mowers to manage to make passable work of it even by going twice over a considerable part of the work. All the machines were ordered into this field of clover; but Crosskill's manager declined the invitation, as he said he thought discretion the better part of valour, and having seen the crop, knew it was his master, as well as every other maker's; however, M'Cormick's machine was taken into this field, and was not able to do anything with it. Then came Mr. Hussey, who got off his machine and examined the crop, and found that if it was to be cut at all, it was by crossing the ridges, meeting the direction of the first laid growth. He then ordered his chief engineer to drive on the horses in his usual style across the piece, which he did at a pretty little trot of about seven miles per hour. The machine got under it, and cut it off famously; but coming back, he left the lower length that lay away from him, having clipped over it and cut all over it. This performance was continued for two or three rounds backwards and forwards until the machine got broken, and all was up for that day. We were more than disappointed to find that the prize was withheld for want of sufficient merit, as we think that there was abundance of merit in it as a new machine; at least there was more utility, and it got nearer the end desired than many of those that have been stamped with medals. There were, as usual, a few dissatisfied in the yard, but this was the "unkindest cut of all."

For the best Dynamometer, especially applicable to the traction of ploughs, and indicating the extent of work done, there was no competition, there being only one exhibitor—Mr. E. H. Bentall, of Heybridge, Maldon, Essex. This is a most excellent instrument, and well worthy of the prize. Indeed, we have never seen anything before like truthfulness in traction dynamometers, and it does great credit to the talent of the inventor, who thus describes it:—"This instrument is intended to test the draught of ploughs. The force exerted by the horses being made to compress two spiral springs, the register of the draught is regulated by this compression. It is supported by an iron frame and four travelling wheels. A strap from the nave of one of these wheels drives a rigger, and with it a metal disc fixed on the same axle. The flat surface of this disc acts on an edged runner which is capable of sliding on its axle, and is, during the experiment, moved by means of a fork connected with the spiral springs to various distances from the centre of the disc proportioned to the compression of the springs; it is, therefore, driven faster or slower in direct proportion to the draught of the plough. On the same axle with the edged runner is a worm that acts on a cogged wheel, along with which revolves a drum with a speed proportioned to that of the runner; hence a line drawn by a fixed pencil on paper coiled around the drum would for equal lengths of furrow be proportioned to the draught of the plough. But motion is given to the pencil in a direction parallel to the axes of the drum, by a screw cut on the

spindle carrying the disc, and the motion in this direction represents the length of furrow drawn; while the two motions combined cause the pencil to describe a diagonal, showing the variations of the draught during the experiment, the line becoming more nearly parallel with the axis of the drum as the draught is less, and *vice versâ*. A brass wheel with its edge graduated revolves also with the drum, to show the degree of draught in stones, when a determinate length of furrow is drawn. This may be used or not, as may be found most convenient. There are several obvious advantages belonging to the peculiar construction of this instrument. In the first place, no special means are needed to obviate the vibratory motion that ordinarily interferes with other modes of constructions; for the power that moves the drum acts uniformly in one direction, and the only effect produced on the drum by variation of draught is simply increase or diminution of speed. Secondly, the draught, with all its variations, is registered by the instrument it-self, without requiring the attention of the experimenter. Thirdly, no after calculation of averages is needed. Fourthly, while in ordinary cases averages are calculated from a limited number of observations, the averages registered by this instrument are the same as if calculated from an infinite series, for the additions are made at every instant, from the commencement to the termination of the experiment."

There were several implements tried that no special prizes were offered for. Among these was the Universal Roller or Clod-crusher. An unusual number and variety of them were exhibited, many possessing some merit; but after a varied and severe trial, all were reduced down to Gibson's, of Newcastle-on-Tyne, and Crosskill's, of Beverley. The latter had two; one of his well-known and widely-spread sort, and another an improvement, by which it is perfectly self-cleaning. After a final trial, Mr. Crosskill's new clod-crusher and universal roller was highly commended, and his old one was commended. Mr. Gibson's was also commended for its self-cleaning principles. We must add that these implements were carefully and fairly dealt with in every way.

For the best Reaping Machine twelve competitors entered the field, and cast lots for their ground, which was laid out across the ridges, these being about five yards wide, with a rather deep furrow, and a very foul crop of rye, that was thin from the bad season for sowing it in last autumn. The crop would average about four feet nine inches high. The first machine started was one of M'Cormick's, which did its work well; then another on M'Cormick's plan, made by Samuelson, which did not answer quite so well. Still both of these machines worked better than they did last year, and are much better made. Then Mr. Bell's machine, made by Crosskill, was started, and made very indifferent work, owing to the horses going so badly, which must always be more or less the case when fresh horses are used, as they are rather taken with the novelty of pushing the thing before them. The two used belonged to a gentleman who had them for railway work, and as they jumped over each furrow it gave the machine an unusual degree of shaking in crossing. However, after going across the piece three times, the horses got to feel their work and went well. This machine was then ordered to stop, while Dray went on with his, which is an improved Russian machine; indeed, the simple contrivance he has applied answers the purpose of saving the man that takes the corn off a vast amount of labour, and it worked very well; but the farmers appeared to be nearly all in favour of a side delivery. Dray was ordered to go on and cut all this piece, while Crosskill's machine was sent to cut a piece at the other side of the field, along the ridges, and across a water-furrow above a foot wide, and fully as deep, which made it rather awkward turning; but after the horses had been half-an-hour at work, they turned at the ends, making a pivot of the wheel next the standing crop, and running the other round it, thus coming into its proper position as quickly as a man can turn-in a plough. There are a few seconds lost at the turnings, as the motion of the web has to be altered in the same way that the wrest of a one-way plough has to be, so as to turn the swathes that the ears may be laid all one way. This machine called forth the applause of all. It worked much easier for the horses than we expected from its cumbrous appearance. The two used were small, but in good condition and spirited. They worked without being distressed, and, after the horses got into the way of going steadily, the cutting, gathering, and delivery were beautiful. Garrett's machine worked very well, and is much improved since last year. The cutting and delivery are the same, but the arrangement and machinery are greatly improved.

Mr. Hussey, the American, also made some excellent work with his improved machine, which is completely altered since the Great Exhibition, and the machinery arranged the same as in Garrett's, but with a cast-iron driving-wheel furnished with cogs about an inch deep, for cutting into the ground and preventing the wheel slipping when the knives are hard worked. This machine requires to be drawn at a speed that farm-horses are not accustomed to; but there is no reason they should not be made to step out during the harvest—if the advantage of delivering the cut crop behind in tidily arranged parcels ready for tying up is worth the small amount of injury the horses can receive by being driven out of their usual pace.

There were three Automaton Reapers tried, but they all proved failures for the present; however, from what we saw, it is evident that in the hands of a Garrett or a Ransome, the truly-magical actions of that machine will be so combined with the gathering and cutting parts, that it will and must act. But it can never be a low-priced machine, though it may be a cheap one—as all good things are.

There was a very ingeniously arranged and simple reaper, exhibited by Mr. William Harkes, of Knutsford, Cheshire. This machine cuts well, but the self-acting delivery failed to fulfil its duty, which disqualified it for further trial at Pusey. It is made to be worked with one horse and one man. Out of the twelve machines tried, six were selected for further trial during the harvest, on Mr. Pusey's farm at Pusey, Berks:—Bell's reaper, exhibited by Crosskill, Beverley; M'Cormick's ditto, exhibited by Burgess and Key; Hussey's improved ditto, exhibited by Messrs. Dray and Co.; ditto, exhibited by Messrs. Garrett and Son; Hussey's new reaper, exhibited by Mr. O. Hussey; M'Cormick's ditto, exhibited by Samuelson.

We wish them fine weather and heavy crops, and that the best machine may win.

Not being able to ascertain the correct data on which the judges in the trial-yard worked out their awards, we can give the public but little information beyond this. The thrashing machines were severely tested with some Rivett wheat, that was extraordinarily difficult to thrash, while the quantity of horns upon the chaff made it very awkward for the combined thrashing and winnowing machines. We never saw worse stuff to manage.

On Stand No. 1 we again met with Mr. Biggs's invaluable sheep-dipping apparatus, which has shed the blessing of peace and comfort amongst the flocks of all farmers and graziers who have used it; and the present high price of wool and mutton render it more than ever valuable. No farmer should allow his flock to go with-

out the use of this or some other application for the same end.

On Stand No. 2 we observed a saddle for cart or farm harness, improved and manufactured by the exhibitor. The improvements are moving boards with ball and socket, with ball on boards and socket in crib. The advantages of these improvements are, the saddle will fit any horse, adapting itself to the back of the animal, whatever its form may be, and whatever position the horse may take, its construction being so devised that the bearings are always level on the back of the horse, yielding at whatever point there is undue pressure. Another improvement is, that the friction occasioned by the jolting of the cart is not on the back of the horse, but on the crib and balls. Price £1 5s. 6d. This, we think, for its comfort-giving effects to the noble horse, should be universally used. Also a collar, with the hames combined, of great merit, as it can be varied in size to fit any neck, from 18 to 23 inches in depth; and the hames being combined makes it strong, and the price (16s. 6d.) brings it within the reach of all.

On Stand No. 3 Mr. Hussey had his widely-known machines, but improved to deliver at the side, which we think a great improvement; but the price is increased to £25.

On Stand 4th we observed Mr. Stanley, of Peterborough, had greatly improved his widely-known roller mills, that so long had the sway as the best; and it appears he may be equalled, but difficult to be excelled; as it was, it was highly commended. Also his economical and efficient steaming apparatus, for preparing all sorts of food for farm stock where cooking is desirable: we also noticed that it had carried away the prize of £5. He exhibited his improved chaff-cutter, which is so well known for its rapidity of action and substantial make, along with the simple means attached for stopping the action of the rollers in case the feeder gets his hand entangled, thus preventing danger or accident. This is a cheap machine, being only £9, the patent safety lever £1 extra. We also noticed a simple, cheap, and economical boiler for heating greenhouses or any other sort of house with a small quantity of fuel. Price only £5 10s. Who would be without a greenhouse, in this age of cheap glass

On Stand 11th we observed Mr. Read, of 35, Regent-circus, had received commendation from the judges for the lightness of draught of his subsoil pulverizer. We also noticed a most useful hand watering machine, adapted for conservatories, greenhouses, &c., price 52s. 6d.; along with a variety of water engines, cattle probangs, and injecting instruments, all of great merit.

On Stand 12th we met with one of the gems of the yard, invented and manufactured by Messrs. Nye and Gilbert, of Wardour-street, Soho, London. This machine is for making sausages, &c.; mincing up, mixing, and at the same time forcing the meat into the skins; it will mince 8lbs. of meat in four minutes; it will also cut suet, vegetables for soup, &c. It may likewise be used for various other purposes. It is made of metal, very strong, durable, and compact, and is particularly adapted for private families. Price £2 10s. This is a little thing that every husband ought to carry home to his wife, who we are satisfied will turn it to the best account, and save the price.

On Stand 13th Mr. Crosskill exhibited his clod-roller, so widely spreading its blessings among the farmers: the judges commended it. Also a new roller, which is a great improvement upon the old one, inasmuch as it is self-cleaning, and is therefore named the universal roller, as it now takes up the place of all other rollers, no other being required on a farm. This implement was highly commended by the judges. Also his celebrated Norwegian harrow, which has been further improved since the Lewes meeting The point of draught is improved by attaching the horses so as to bring the line of draught straight with the centre of the middle set of rowel spikes. The rowels have longer points, oval-shaped and thinner, so as to cut with their edges, and give them more hold of tough, hard soil, as well as pulverize the land better and deeper. The three sets of rowel spikelets each cut into fresh ground, thus making more perfect manipulation by cutting every inch; while others, with four sets of rowels, only cut every inch and a-half. The rowels are placed upon round axles, which renders them less liable to break among stones, and more easy in turning the implement. The following are the uses of this implement:—For harrowing immediately after ploughing, it breaks and pulverizes the furrow, leaving three or four inches' depth of fine mould, forming a good seed-bed. While other pulverizers consolidate the land, and harrows tear the stiff moist clay into large lumps, the Norwegian is the only invention that thoroughly pulverizes without consolidating the soil. We also noticed a first-rate Ducie drag, another of the standard implements of the day. We saw on this stand one of the Hussey reapers of last year, as made by Mr. Crosskill, and observed that further improvements have been made in Hussey's reaper, which may at small cost be added to the Hussey's machines supplied in 1852. In this machine the speed of the cutting knives is increased, so that the horses may go one-fourth slower, as at the ordinary pace when ploughing. The knife used in America, where the climate is very dry and the crops light, was formed to cut at an angle of 70 degrees. It has since been improved, and is now made to cut at an angle of 45 degrees, and with sickle edges, to suit the moist condition of the heavier crops and humid climate of Britain. This form of knife or cutter is not only better adapted for greenish crops in wet or dry weather, but it greatly reduces the liability to clog. The improved cutters are a combination of a draw and clipping cut, making the machine much easier draught for the horses. The price of a new set of knives or cutters is 15s. (which will be sent to order on receipt of 15s. in postage stamps), when any village smith can rivet the knives on the knife blade of the machine. In many parts of the country the land is intersected by furrows, across which the reaper has to pass. When these furrows are deep the bevil wheel of the machine is liable to dip into the soil, and fill the cogs with dirt; this is now overcome by an improved iron guard plate, which can easily be affixed to the reaper, and enables the machine to sledge over the furrows without stoppage. The price of a guard plate is 5s. (which will also be sent to order on receipt of 5s. in postage stamps). While many parties persevered and successfully introduced the new reaping machine during the wet and unfavourable harvest of last year, not a few fell short of the perseverance required to overcome the difficulties attending such an unusually wet season, with untried horses, and in many instances prejudiced harvest men. That such a wet season does not occur once in twenty years is proved by the rain gauges at the Royal Greenwich Observatory, where it is recorded that in 1852 the fall of rain was 34 inches, while in 1851 it was 20½ inches, and only 19½ inches in 1850. Price £18. On this stand we welcomed the sight of Bell's far-famed reaper, which performed its work so well in the trial, inasmuch as this is one of those machines that crossed the Atlantic, and set the Americans a-going. We are not to allow ourselves to be led away with the idea of any originality of invention having sprung up in America, as three of these machines were sent over there about 1834, besides several on to the continent; but as they were made by a country wheelwright, and not finished and

put together as such machines require to be, we are not to be surprised they did not go ahead in those countries as well as at home. When we look at the two American reapers of 1853, and compare them with those of 1851, we cannot but wonder how our American brethren left their machines so long without increasing their labour-saving power by the application of self-delivering power long before this time; but it remains for the English genius and mechanic to make a perfect reaping machine. We consider Bell's reaper makes work that is almost faultless; the only objection is its somewhat cumbrous look; but, as it appeared to be no harder work for the horses than either of the others, and when we reflect that this machine will traverse the land, gathering, cutting, and delivering as much corn in a heavy crop as the best six-horse combined thrashing machine will get through in the same time, we must bow to the reaper as a wonder-working implement, that has sprung up just when required to meet the wants of the British farmer. There is no doubt but that many thousands of acres will be cut with Bell's machines in the north, where upwards of sixty machines are already ordered by those spirited men who will always be first in the field of improvement. Bell's reaper is propelled by the horses pushing behind, while the man steering guides the machine and horses, in the same way that a Bedford drill is managed, so that its direction is completely under his command; thus the machine charges into the standing crop in any direction, cutting and delivering the corn in a swathe as straight as a plough furrow. This machine consists of a perfect set of scissor cutting apparatus, driven by a serpentine wheel motion, without any cog wheels, and a reel for bringing the corn to the cutters and laying it when cut upon the endless web, which, revolving upon rollers, delivers the cut corn on either side of the machine; while a turnswathe turns the corn after it has left the web into a swathe at right angles to the machine, in the same way that the hind half of a plough mould-board turns the furrow after it has been turned on an edge by the fore half of the mould-board; thus the web leaves the swathe standing on its root ends, and then the turn swathe pushes it off at right angles to the line of progression. Mr. Bell, after fourteen years' experience, employs, on the average, eight women to gather, make bands, and lay the corn in the bands, four men to bind, and two men to stook or shock, completing twelve acres per day, in cutting heavy crops of wheat, barley, and oats. Price £42 cash.

We received satisfaction in examining the carts and waggons exhibited by Mr. Crosskill, which for the combination of strength, lightness, simplicity, and durability were not excelled, if equalled, in the yard: a good proof lay in their all being sold early the second day, and orders given (chiefly by Welsh and south-country gentlemen) for more than ten times the number ordered at Lewes last year. This speaks well for the spirit of these districts, and augurs that improvements will be advancing rapidly. The prize for the best waggon was awarded to Mr. Crosskill; and how the prize for the best cart slipped away from his stand we could not understand. However, such will sometimes happen. Mr. Crosskill appears to have arrived at the perfection of wheel-making, with the combination of excellent materials, accuracy of fittings, and beauty of workmanship. These wheels are manufactured almost entirely by machinery. By the use of patented machinery, expressly invented for the manufacture of wheels of every description and size, worked by powerful steam-engines, these wheels are made better, firmer, more true, more durable, and also much cheaper, than common wheels made by hand. Wheels of any size are thus made to order, with improved iron or wood naves, plain or patent axles, with perpendicular or lateral spokes, and dished or cylindrical tires. Crosskill's improved wheels, with plain or patent axles, are fitted with improved iron naves or new patent ball naves, cast upon steel pins, and with latest improvements, are most thoroughly case-hardened, so much so as to resist the file. The arms are turned perfectly true by self-adjusting machinery, and, after being case-hardened, are fitted complete to a wrought-iron axle. The spokes are made of well seasoned English oak, driven into the naves by a power machine, and then fixed into a machine for turning the end of each double-shanked spoke, so as to fit into double-shouldered sockets, bored with equal precision in the felloes. The ash felloes are sawn out, segmented and turned by machines, and present a beautiful finish equal to a piece of cabinet ware. The hoop tires are bent, cut, bevelled, fitted, and hooped by machinery. The first-rate workmanship, superior materials, and very low price of these wheels prove that machinery is destined to supplant hand labour in the making of wheels. Set of patent wheels and axle (No. 0 in maker's list), four feet six inches high, two-inch tire, price £5 10s.; or by the proposed plan of six sets at once 10 per cent. less, £5 each set. We observed some excellent wheels with wood naves four feet six inches high, warranted to carry 25 cwt. loads, besides the cart, which, with the axle and pair of four-inch wheels complete, only weighed 5 cwt. 22lbs. His liquid-manure cart is so widely known that we need not say it is still without a rival.

We are glad to learn that Mr. Crosskill's portable farm-railway is still increasing in demand as it is introduced into new localities. We recollect that it was awarded the honorary medal at the Royal Norwich meeting, and a second medal at the Exeter meeting. This portable farm-railway is adapted for various farming and other purposes. It will convey over the land manure, marl, lime, &c.; and take off the land all kinds of green crops, as turnips, potatoes, and other produce. It is also very useful for removing earth, to level, excavate, and embank; and for clay pits, brick yards, and tileries. This rail will compete with carts, and prove far more expeditious and less expensive, especially in wet weather, when the land is so heavy as to become almost impassable for carts. The rails, manufactured in parts or lengths, are fifteen feet long by two feet eleven inches wide, and two feet six inches gauge; the ends fit into iron sockets. The wood rails are made of the best deal, strongly put together and edged with iron, and made to carry 15 cwt. truckloads. The portable railway is very serviceable for taking off turnips, and is much better and cheaper than carts going upon the wet land, and doing considerable damage. With 100 yards of rail, a quarter of an acre may soon be cleared, the turnips being gathered up six yards on each side of the rail. Two active boys will move 100 yards further on, and replace it, in less than ten minutes. The following is an estimate of the cost of a portable farm railway to carry 15 cwt. loads:—

	£	s.	d.
100 yards, or 20 lengths of rail, at 4s. per yard..	20	10	0
1 truck with side tippers, to tip on either side..	5	0	0
1 truck with end tipper, to tip at one end	5	0	0
1 turn-table.....	5	0	0
	£35	10	0

A package of farm railway, for delivery; improved and manufactured by the exhibitor. To reduce the cost of delivery of the portable farm railway, by rail or vessel, the rails are thus packed for delivery, consisting of four lengths in one package, fifteen feet long, twelve inches square, and weighing about 4½ cwts. only. Where any parties wish to use their own wood, sets of ironwork only may be had; and landowners, especially on the peat bogs of Ireland and the mosslands of Scotland, as

well as the light and heavy lands of England, may be thus supplied. Two lengths of angle iron, straightened and drilled, ready for screwing down upon the wood bars of the rail; also with bolts for bolting together the sleepers and longitudinal bars, the four end sockets to fit other lengths, with catches complete, 1s. 10d. per yard, or 9s. 2d. to suit a fifteen-feet length of rail. Sets of ironwork for the wheels and axles of a railway truck may be had, to carry 15 cwt. loads, ready for mounting a truck or waggon-body of any shape, the four wheels and axles per set £2. After much experience, Mr Fyson, of Barningham, near Ixworth, Suffolk, gave the following practical report of this railway:—"The quantity the rail will carry, estimated by measure, is half a yard, or about 13½ bushs. in each truck. With a hand-barrow a man will take a load of two bushs.; the same man will take six times as much upon the rail as he can barrow over the ground, and with equal ease run the trucks twice as fast. In case of an incline, a donkey—or, in working out of a deep pit, an old horse—and then to walk by the side of the rail—four, six, or more trucks may be drawn at one time; and the greater the quantity of work to do, the cheaper it can be done. Generally a boy goes with the man, to assist to push and unload." Sets of ironwork for rail, at per yard, 9s. 2d.

We were much pleased with an inspection of a sanitary cart for town nightsoil, sweepings, &c., improved and manufactured by the exhibitor. This cart is recommended to every board of health, for carrying out sanitary improvements, and to every farmer located near to a town where night-soil, sewage-manure, street-sweepings, &c., may be cheaply obtained. The Board of Health in Hull have had more than twenty of these carts, and expect ere long that the sale of the refuse manure will repay the cost of scavenging. We wish we saw this cart earnestly employed in every town, where it might be named the Anti-Fever Cart. This cart is made of wrought-iron plates, strongly bolted together; the body is of a semi-circular shape, with sides rising up at the centre, so that the top has roof-like coverlids; the front lid being fast, while that behind acts as a folding-door, and prevents the soil being thrown over when filling the cart. The improved chain, rack, and pinion-motion, for tipping the cart-body partly or entirely upside down, is well suited for discharging the filth of towns. The body can be tipped and lowered close to the ground; thus saving immense labour in scavengers' work. For carting gravel and other solid materials this cart may be used with great advantage, or it may convey 280 gallons of liquid or semi-liquid loads at a time. Price, £27. Off orders for two carts at once, less 5 per cent.; and off-orders for three carts at once, less 10 per cent, will be £24 6s.

Barnett's patent flour mill was exhibited, and we hope that millers and others will give it the attention it merits, and let the public have the benefit of its attendant blessings.

Mr. Crosskill's Archimedian root-washer is so well known that we can only add, that those who wash roots cannot get on satisfactorily without its labour-saving powers. It is low in price.

Mr. Torr's pig trough is the most perfect and economical yet introduced; one of these was here exhibited by Mr. Crosskill, and sold into Wales, and numerous orders taken from gentlemen and farmers for them. This is a long cast-iron trough made with two upright ends, from which an iron shutter is suspended, to be moved either backwards or forwards, and held by a simple latch while the inside or fattening pigs are feeding, and reversed when the outside or store pigs are feeding; thus there is no waste of food nor surfeiting of pigs, as the trough is always cleaned out. These troughs are built into the walls, saving their length of building. Price, £2 for those three feet long, and £1 extra for each increase of one foot, and fractions of a foot in like proportion.

On stand 14 we were delighted with the construction and efficient working of a turnip cutter, invented by Mr. Kealy, of 369, Oxford-street, London; improved by Evan Davis, of London; and manufactured by the exhibitor. The cylinder is composed of sheet iron, with diagonal openings for two or more double edged knives, each of which may be used for cutting, or for slicing, or direct and reverse motion for cutting or slicing altogether, and throwing out the produce of four or more knives. The knife is composed of a single plate of steel, having serrated or jagged edges, the sizes of the teeth of which may be regulated at pleasure. For cattle and sheep the size being determined, the required thickness is got by the adjusting of the ledger-plate, and by the simplest of movements The superiority of the new form of knife is too evident; for instance, there is no unrivetting in case of stoppage from accident, as a fresh knife can be fixed in the time occupied by fastening the screws. Another important advantage is obtained by being able to decide at once on the size of the bulb to be cut, and selecting a knife or knives, the teeth of which shall exactly determine the cut even for lambs. The hopper has two open gratings, as well for the greater convenience of getting rid of the stuff adhering to the roots as for filling; and the apparatus is secured from injury by two semi-circular zinc caps, fastened by bolts. Price, £5 10s.

On Stand No. 15 we observed a patent socketing apparatus, of great value in draining-tile manufacturing, especially where there are quagmires and quicksands. We think this plan superior to collars and pipes. This implement is for the purpose of socketing or collaring pipes made by the exhibiter's tile machines. It consists of a frame, forming a graduated incline, upon which the socket box is fixed, and is constructed that the socket box may be raised or lowered, so as to receive pipes of any length. The socket box has a moulding rim and a plunger, worked by two levers. This machine, being supplied with suitable socket boxes and plungers, will socket pipes of any length or diameter with great despatch. It is made of iron, very strong, and so simple in its operation that any person may work it. Price £7 7s. This implement is a valuable adjunct to Mr. Whitehead's well-known tile machine, the working of which bears witness to its value.

On this stand we also met with Mr. Bleasdale's land pulverizer. This machine is very similar to Samuelson's digging machine, but differs widely in the means applied for clearing the digging forks. This would be an invaluable implement for eradicating twitch on light soils. This is a machine for turning up and loosening the soil, and clearing it of obnoxious weeds and roots. It is formed with a framework somewhat like that of a land roller, in which is a horizontal axle or shaft, carrying a series of digging teeth set at regular intervals asunder. These teeth are curved at right-angles to the shaft, and in the direction of revolution; and they are arranged so as to cut into the earth as the machine travels forward. Alongside this shaft is a second parallel clearer shaft, set in bearings higher up, and made to revolve in a direction the reverse of the shaft. On this secondary shaft are a number of forked teeth, bent in the direction of their rotation, like the diggers—*i. e.*, the two sets of teeth work into each other, each fork of the clearers embracing a corresponding digging arm. When drawn over the soil, the digging teeth or arms penetrate the soil to the necessary depth, and carry up the weeds and roots, which are thence carried away by

the action of the secondary or "doffers;" the ground being thus broken up and cleaned at the same time. Price £18.

On Stand 19th we met with an old acquaintance—Hurwood's steel mill. This mill has never been equalled since it first appeared before the public in the Great Exhibition, since which it has remained unrivalled as a meal mill; but, from a change in the opinions of judges this year, they gave the preference to stones, because they made softer meal. However, they have highly commended this mill. This mill obtained a prize medal at the Great Exhibition, 1851; obtained the prize of £10 for the best grinding mill for breaking agricultural produce into fine meal, at the Royal Agricultural show at Lewes, 1852 (see Judges' Report, in the Society's Journal, vol. 13, part 2nd); obtained the medal of the Yorkshire Agricultural Society for the best grinding mill for breaking agricultural produce into fine meal, combining durability and economy, 1852. The grinding surfaces of the mills are each fitted with a series of cutting rings, for grinding barley, wheat, oats, and other grain, linseed, Indian corn, lentils, peas, or beans. This invention gives the facility of grinding various products to any degree of fineness, from merely splitting the article to reducing it to fine meal, without injury to its properties, or its being necessary to change any of its parts. These mills may be worked by manual, animal, or steam power, and are recommended for agricultural purposes; and will grind, if driven by the ordinary horse machine, the following quantities:

	Barley, into fine Meal.	Oats, for feeding.	Beans, split.	Beans, fine.
One horse, per hour, from	Bushels. 3 to 4	Bushels. 4 to 5	Bushels. 4 to 5	Bushels. 2 to 3
Two horse work, per hour.....	5 to 6	5 to 6	5 to 6	3 to 4
If driven by steam or other adequate uniform power, per hour, upwards of..	12	10	15	5

Cash price, £22 16s.

As an indispensable adjunct to the foregoing mill, is Mr. Hurwood's flour dressing apparatus, designed for separating the flour from the bran, in the meal ground by the patent metal mill.

Mr. Hurwood also exhibited a case containing specimens or models of Hurwood's patent ventilating windows, invented and manufactured by the exhibiter. Obtained honourable mention at the Great Exhibition, 1851. Used for ventilating the Great Exhibition building. Windows or ventilators fitted with these patented movements are secure in every position, and are admirably adapted for dairies, stables, and other buildings requiring good ventilation. The prices at which they can be supplied vary according to design and fitting. For general purposes, stout iron windows, fitted completely, may be supplied from 2s. to 2s. 6d. per foot superficial.

At Stand 20th we were highly interested with the taste displayed by Messrs. Ransome and Sims, in the finishing, painting, and arrangement of their implements, machines, and engines. We were more substantially delighted with the soundness of the mechanical principles upon which their ploughs were made. It is well known that their ploughs, taken under all circumstances, are seldom excelled. Indeed, they are always the foundation: some trifling alteration is made to meet some local whim or difficulty. It would be out of place to say more of implements that almost every reader uses, and therefore knows their great merits. However, we cannot pass over his patent truss beamed iron two wheeled Y.L. plough, the merits and value of which cannot be too widely dispersed, being especially acceptable to the team and man, on account of its ease of management and lightness of draught. This plough was awarded the prize of £10, and silver medal, as the best heavy land plough, and a prize of £10, and silver medal, as the best light land plough, at the Royal Agricultural Society's meeting at Southampton; also a prize of £10 at the Royal Agricultural Society's meeting at Northampton; and the Council medal of the Great Exhibition, with this plough, as made by Busby. This is a plough in general use, to be worked by a pair of horses abreast. The handles and beam are made of wrought iron—the latter upon what is called the truss principle, which, connecting the two sides firmly together, gives strength, so as not to bend or give way to a resisting force on either side. The frame or body of the plough is of cast iron, to which the mould board ground iron, and ploughshare are attached, and are removeable at pleasure. Cash price, £4 5s. 6d.

In these days of level cultivation, we must not pass over that most efficient and good implement, Lowcock's patent iron one way plough, with two wheels, and skim coulter, invented by H. Lowcock, of Westerland, and improved and manufactured by the exhibiters. Obtained the prize of £5 at the Royal Agricultural Society's meeting at Southampton, a prize of £5 at Shrewsbury, and a prize of £5 at Exeter, at the Royal Agricultural Society's meetings; and a prize of £7, as the best turnwrest plough, at the Royal Agricultural Society's meeting at Lewes. This plough is adapted for turning furrows in one line of direction, and parallel to each other. It does not require to be turned round at the end of the field; but the ploughman, having completed his furrow to the right, turns over the handles from one end of the beam to the other. The horses turn on the land side of the plough; and as soon as they commence work, the left-hand share and coulter set properly into their work. It is marked L.P. Cash price, £6. This plough has again carried away the prize of £7 with great ease.

We must also call attention to Biddell's patent wrought iron scarifier, grubber, or cultivator, invented by A. Biddell, of Playford, and improved and manufactured by the exhibiters. This implement obtained the prize of £10 at the Royal Agricultural Society's meeting at Liverpool; also at Northampton, in 1847; at York, in 1848; at Norwich, in 1849; and at Lewes, in 1852. This valuable implement is used for cultivating land under a variety of circumstances, and bringing it into a proper state more effectually, and at less expense, than by the means generally employed. It may be successfully used to clean wheat, bean, and pea stubbles after harvest, also in breaking up clover leys that have failed in plant. In breaking up land after green crops, in May or June, for turnips, coleworts, &c., in preparation for barley and oats, and a variety of other purposes. Marked No. 2. Cash price, £18 10s. This unrivalled implement has again carried away the prize of £10, after competition with a large field of the best implements of the day.

We must not pass over a registered Tennant's grubber, invented by J. Tennant, of Monkton, and improved and manufactured by the exhibiters. This is an effective implement for disintegrating and cleansing land after harvest, which it performs in an effective manner. Cash price, £4 5s. 6d. This implement is just what has been long wanted, to give the small farmer a chance of competing with the large farmers.

We were pleased with their steam engines, and we were informed that they worked exceedingly well; and

we can bear witness to the excellency of the materials and perfection of workmanship. There was only one thing we regretted, which was, to find that expansion gear was not disqualified last year, instead of obtaining a prize, thus driving Messrs. Ransome and Sims, as well as all others, to use a complication that has no adequate value in small high-pressure engines. We hope that the knowledge of the Council will lead them to disqualify any engine using expansion gear, which we are sure all the best judges will approve. We will not presume to say much of engines in general, as they are difficult pieces of mechanism to speak with confidence about as regards their working powers; but one advice we would give all purchasers who are not judges of the article themselves—to go to some of those firms whose position and credit ensure a good engine at a moderate price.

Messrs. Ransome and Sims carried away both the prizes for portable horse thrashing machines, thus taking the whole sway in that department. The four horse power machine, that took the prize of £15, has been much improved since last year. The drum is of iron, with six beaters, revolving 310 times to each revolution of the horses. If the latter walk two miles per hour, the drum revolves 900 to 1,000 times per minute, thrashing the corn quite clean, without distressing the horses. The requisite speed of the drum is obtained by three pairs of wheels, instead of two, as formerly. This alteration, combined with a correct form for the teeth, has added to the ease of working, and decreased the wear and tear of the machine. All the wheels, except the large one, are bored, and the shafts turned, to gauges; so that any one may be replaced by a common mechanic. The whole machine is of simple construction; and being made of the best materials and workmanship, may be kept in repair at a very little annual cost. By a proper adjustment of the screen or concave part, against which the beaters act, barley may be thrashed without injury, and peas and beans may be thrashed by it equally well. Cash price, £57.

The two horse thrashing machine that took off the £10 prize is similar in principle to the three and four horse machines, but made lighter, and the various parts made less, to meet the reduction in power. It is very compact, and easily removeable from place to place. It will thrash all descriptions of grain; and the horse power can be used for driving a chaff cutter, crushing mills, &c. Cash price, £38.

We are sorry time would not permit our taking strict notice of the seed crushing, grinding, and bean splitting mills, cake breakers, chaff cutters, dressing machines, turnip cutters, &c., all first class of their kind, and got up in the most superior way. We must, however, make a few remarks upon a new bean cutting machine of great merit and utility, for cutting either hard or soft beans. This implement, from its simple and novel construction, possesses advantages which will be obvious to the practical agriculturist. The largest and smallest varieties of beans are equally well prepared, and this quite independently of the dryness of the grain; for, whether hard or soft, the efficiency of the operation is the same; while no choking can take place. The power required to prepare a given quantity of grain is less than in an ordinary bean mill. It consists of a cylinder carrying a number of cutting edges revolving against a fixed abutment. The teeth are separate pieces of hardened steel, each tooth having three prepared cutting edges; so that when one edge or set of edges become dull, they may be taken out, turned one-third round, put in again, and a new edge or set of edges is obtained; and when these fail, take out again, turn one-third round, and it makes a second fresh set; and when this third resource fails, they may be taken out and readily replaced with new teeth by an ordinary labourer, at a very small cost. The iron against which the cutters work may also be readily replaced, at a very small cost. Price £3 3s.

They also exhibited a variety of larger mills, and a stone mill of good design, besides a host of other first class implements too numerous to mention, including the automaton reaper, which we have no doubt will be perfected before another harvest. This machine is known as Atkins' patent automator; or, self-raking reaper; invented by Jearum Atkins, of Chicago, U.S., improved and manufactured by the exhibiters. This important and valuable machine, though at first sight it may appear somewhat complicated, is, in operation, exceedingly simple and easy of management. As its name implies, it is self-raking: thus dispensing with the man required to take off in most reaping machines. It cuts in the same manner as others. It is fitted with a reel, for the purpose both of inclining the grain towards the platform preparatory to being cut, and bringing it, when cut, on to the platform. The knife-bar is on the upper side, instead of being placed, as usual, flush with the back edges; is in the middle of the blade, and as far forward as the angle of the cutting will allow. The back side, instead of being left straight, is cut zig-zag, and each alternate edge is levelled the other way and serrated. By this arrangement it is scarcely possible to choke; as the knife-blade, resting on the fingers, and the edges front and rear being in close contact with them, any matter accumulating upon the fingers will be picked off by the sharp points of either the front or rear edge of the knife. Sufficient corn for a sheaf having fallen on the board, round comes the long arm carrying the rake, and, pulling across the entire bed of the machine, collects the grain into a compact bundle against a sheet-iron plate, and then, with the sheaf in the grasp, the rake and iron plate immediately make a quarter turn round the back of the machine, the rake arm is caused to stretch out behind, relaxing its grasp, and the sheaf falls in the line of the horse-walk (out of the way of the horses) the next round, and the rake-arm takes a sweep round back to its work. With reference to the motion of the rake, it is the quickest at those points where a quick motion is most needed, viz., in sweeping the platform and while opening in the rear of the machine for delivering the bundle. The main driving-wheel is large, being four feet in diameter, with a four-inch felloe, giving steadiness of movement in passing over rough ground, and good support in soft. The grain-wheel, too, is two feet in diameter, and may be increased if desired. The framework is well braced and stiff, supported and strengthened with iron wherever necessary. The gearing is compact and symmetrical, well boxed in and protected from dirt. The team is relieved of weight and of the side draught by resting the hounds upon a pair of front wheels, making it also very convenient to turn a square corner, as will be learned by a little practice. The driver's seat is elevated and easy, giving him good command of his team, while, at the same time, he can watch the operation of the knife, reel, and raker; and, if necessary, instantly throw the machine out of gear, by the lever at his right side. The careful handling of the grain by the rake saves a small per-centage over raking by hand. The height of cutting is regulated by a very simple arrangement, and the knife may be set close to the ground. The draught is comparatively easy for a pair of horses, and is not perceptibly increased by the raker; the team, however, ought to be changed every two or three hours. Price £40.

They also exhibited a large assortment of implements for the cultivation of sugar canes.

On entering upon Messrs. Garrett and Son's stand, we were as usual surrounded with prize, highly com-

mended, and commended drills, &c., which are well described thus in the catalogue :—

A drill for general purposes; invented, improved, and manufactured by the exhibiters. Prizes were awarded for this drill at Liverpool, 1841, £10; at Derby, 1843, £30; at Southampton, 1844, £20 and a medal; at Northampton, 1847, £15; at Exeter, 1850, £10; and at the Great Exhibition 1851 included in the award of the council medal. This drill is adapted for performing the various operations of seeding and manuring the land: all kinds of grain and seed may be deposited at any required distances apart, and at any depth, either with or without compost or artificial manures. They are constructed of various sizes and widths to suit all descriptions of lands, whether ploughed flat or in ridges, and the corn or seeds may be deposited down the same conductors with the manure, or, if required, through separate coulters, which admit of the manure being buried two or three inches deeper than the seed, and a portion of mould to be placed between the two by the medium of double-action levers—a very valuable addition to the drill; and the weights required to regulate the depth of the manure act on the centre of the lever, a great improvement on those hung on the side of the lever, which are very liable to throw the coulter out of the proper track. Price, complete with seven jointed levers and ten corn levers and tins, £43; if with improved fore-carriage steerage, extra £3 3s. Prize of £10.

A drill for turnips and manure on the flat; improved and manufactured by the exhibiters. Prizes were awarded for this drill at Cambridge, 1840, £10; at Northampton, 1817, £10; at York, 1848, £10; and at the Great Exhibition, 1851, included in the award of the council medal. This drill is made to deposit two, three, or four rows of turnip or other seed with compost or artificial fertilizers on either flat or ridge-ploughed lands: it is fixed with separate seed boxes for each row, which are fixed on a horizontal bar, and may be shifted to suit the varied intervals between the drills so as to come directly over the delivering spouts and allow the conductors to work freely: there are four double-action levers fitted to this drill, and improved seed conductors. Prices, including the four jointed levers and improved seed conductors, £23 10s. Prize £10.

A drill for turnips and mangel wurzel with manure on the ridge; improved and manufactured by the exhibiters. Prizes were awarded for this drill at Bristol, 1842, £20; at Northampton, 1847, £10; and at Norwich, 1849, £10. A two-row lever drill for depositing turnips or mangel wurzel with compost, guano, or well rotted farm-yard dung on ridge-ploughed lands. The manure and seed coulters are fixed on separate levers acting independently of each other, so that any depth of soil may be placed between the manure and the seeds. The concave rollers are placed behind the manure coulters, for the better formation of the ridges, and may be raised out of work at the end of the fields or when travelling on the road, and regulated so as to give the pressure required, which varies according to the nature of the soil: the depositing coulters and rolls act independently of each other, and adjust themselves to the regularity of the surface. Price, complete with improved seed conductors, £21 15s. Highly commended.

A three-row economical drill for turnips, &c., with manure on the flat or ridge; invented and manufactured by the exhibiters. A prize of £5 was awarded for this drill at Lewes, 1852. This is a cheap and efficient drill for the purpose of drilling in rows, on either flat or ridge-ploughed lands, turnip and mangel wurzel seed with rape-cake dust, guano, Irish peat charcoal, or any light pulverized manure: it comprises in a single form most of the important features in more expensive drills. The manure coulters are fixed to a swing bar, while those for seed are attached to levers to admit of the manure being buried any depth in the soil, and the seed to be deposited directly over it with a portion of mould between them, for which forks are provided: it is calculated for two rows from 20 inches to 28 inches apart, and three rows at 16 inches apart; and the quantities may be delivered as required—say, for turnips, 1 lb. to 6lbs. per acre; beet-seed, 3lbs. to 8lbs. per acre; and the manure may be regulated as required, from 2 bush to 16 bush. per acre. This drill is adapted for the draught of one horse or pony, and will be found most convenient and easy of management. Price £12 12s.; if made to drill three rows beans without manure, £1 10s. extra; if made to act as a horse-hoe, £2 8s. extra. Prize of £5.

A ten-row lever corn and seed drill; improved and manufactured by the exhibitors. A prize of £10 was awarded for this drill at Norwich, 1849. This drill is for the purpose of drilling in rows, at any distance apart, wheat, barley, beans, peas, and other grain; and, by changing the delivery barrel, turnips, mangel wurzel, and other seeds. An improvement is made in the fore-carriage steerage, by the introduction of a quadrant, which, by means of screws, is made to act as a break, and has the effect of rendering the steerage more steady while at work, and easier of management. When drilling on hilly land, where it is most objectionable to attach the horses by the means of whippletrees, the shafts may be attached to the steerage without in any way affecting its operations. The barrel may be driven from either side for hilly lands. Price, with fore steerage, £26 8s.; do., without £23 5s. Highly commended.

A nine-row lever corn and seed drill; invented and manufactured by the exhibitors. A prize of £10 was awarded at Exeter, in 1850, for this drill, and at Lewes, 1852, £5. This is a cheap and efficient drill, suitable for farms of a small extent. It is adapted for drilling all kinds of grain, turnips, and other seeds, and the quantities may be regulated by means of cog wheels to deposit from 2 pecks to 14 pecks of grain, or from 1 lb. to 6 lbs. of seed per acre. The distance of rows apart may be varied as required, from 6 in. upwards, to suit different crops. The whole of the arrangement of the working part is completely within the management of the attendant. It is suited especially for lands ploughed on the flat, and for the draught of one horse. Price, complete, £16. Commended.

A broadcast manure distributor; invented by H. E. Blythe, Esq., of Burnham, Norfolk; improved and manufactured by the exhibiters. A prize of £5 was awarded for this machine at Lewes, 1852. This machine is for the purpose of distributing regularly all kinds of natural and artificial manures; and the novelty of the machine consists in the arrangement of the machinery for the perfect and regular delivery of the most difficult manures used as top-dressing—such as nitrate of soda, salt, guano, soot, &c. The manure is delivered from the box by the means of a barrel of a novel construction, consisting of a shaft fitted with prongs which carry over the manure, and, in so doing, come in contact with a series of scrapers which rise and clean the barrel as it rotates, without the aid of brushes, sweepers, or any other perishable material; from whence it passes down the shoots or conductors, and is evenly distributed all over the surface, or in three or more rows. The shoots or conductors are furnished with wire rods fixed in alternate lines, giving them the effect of a sieve, whereby the manure is separated and pulverized as it falls. Price £14 14s. Prize £10.

A patent drop drill for turnips and other seeds with manure on the flat or ridge; invented, improved, and manufactured by the exhibitors. Prizes were awarded for this drill at Norwich, 1849, £10; at Exeter, 1850, £10; and at Lewes, 1852, £10. This drill is for the purpose of dropping the manure at any intervals and depths that may be required, and covering it with mould, and for dropping the seed in any minute quantities directly over the manure, leaving a portion of mould between them, both seed and manure being regulated to the greatest nicety. The same drop levers answer for drilling in the stream in the usual way when required. Price £24 10s. Prize of £10.

(New implement.)—A five-row turnip, mangold, and vegetable seed drill; invented, improved, and manufactured by the exhibitors. This drill is calculated for sowing five rows of seed, and covering a space of 7 feet 3 inches at one time. By removing the levers and substituting a fan or conductors, it is made into a seed engine adapted for sowing clover, trefoil, &c., broadcast through one compartment; and lighter seeds, such as ryegrass, through the other—the former being delivered by the means of cups, and the latter by brushes, down the same conductors; the required quantities of each seed are thus nicely mixed and evenly sown all over the land, and may be regulated by turning the screw at the end of the box for rye grass, and changing the wheels on the cup-barrel for clover. Price £16. Highly commended.

A No. 5 Garrett's patent horse hoe; invented, improved, and manufactured by the exhibitors. Prizes were awarded for this implement at Liverpool, 1841, £5; at Bristol, 1842, £10; at Derby, 1843, a medal; at Southampton, 1844, a medal;

at Northampton, 1847, a medal; at York, 1848, a medal; at Norwich, 1849, £10; at Exeter, 1850, £10; at the Great Exhibition of 1851, Council Medal; and at Lewes, 1852, £10. This implement is calculated for effecting an important improvement in field cultivation, as by its use corn or oats of every kind, drilled in rows of not less than seven inches apart, may be hoed in a superior manner, and at a cost not exceeding 6d. per acre. It is adapted for all the prevailing methods of drill-culture, either for cleansing crops drilled on level surface or in ridges—the axletree being moveable at both ends to suit the varied intervals between the rows of plants; and as each cutting hoe works in a separate and independent lever, the weeds are effectually destroyed, however uneven the surface of the ground, the hoes being kept in a uniform depth by means of regulating keys. The horse hoe offers advantages over hand hoeing besides the saving of expense, inasmuch as the work may be performed at the proper time; and as the hoe penetrates a greater depth, fresh life and vigour are given to the growing plants by stirring the earth around them. The steerage forms a valuable feature in the implement, as the hoes may thereby be guided with the greatest precision, perfectly hoeing the intervals without injuring the plants. As much as ten to fifteen acres per day may be hoed with one horse and one man and a boy. Price £16. Prize of £5.

(New implement.)—A patent revolving horse hoe; invented by Mr. John Martin, of Barmer, near Fakenham, Norfolk; manufactured by the exhibitors. This implement is adapted to hoe turnips and other roots upon either flat or ridge work at any distance apart, fit to be singled, the same as is now done by manual labour. It will cut the ground at any depth required, to five inches deep, and will leave the plants at any distance that may be required, and when set to a particular distance it cannot err. It will do two or more drills at the same time; and for two drills is worked by one man, a boy; and one horse. On ridge work it will do one acre per hour f and the inventor during the past season hoed 120 acres o, turnips with it. Price £31 10s. Silver medal.

A two-horse power portable thrashing machine; invented and manufactured by the exhibitors. This machine obtained the prize of £10 at the Lewes meeting in 1852. It is adapted for thrashing all kinds of grain, and is suitable for occupations of small extent. With two horses it will thrash about twenty bushels of wheat, barley, peas, beans, or oats per hour. Price £36. Highly commended, the drum being the best exhibited in point of workmanship.

A four-horse power open drum thrashing machine; invented improved, and manufactured by the exhibitors. This machine obtained the prize of £20 at the Lewes meeting in 1852. It is for the purpose of thrashing wheat, barley, beans, peas, and other grain; also for drawing clover and ryegrass. A peculiar arrangement of the drum and concave is introduced, whereby the draught is considerably lessened, and the machine rendered more efficient and perfect in operation. Price £56.

A four-horse power bolting thrashing machine (barn work); invented, improved and manufactured by the exhibitors. Prizes were awarded for this machine at Newcastle, 1846, £25; at Northampton, 1847, £20; and at York, 1841, £20. This machine is for the purpose of thrashing every description of grain. Its chief characteristic is the perfect manner in which the work is performed—the straw being delivered quite straight and unbroken, and the kernels uninjured. It is particularly adapted for thrashing barley for malting, as it will in no way injure the germ of the seed. It will be found a valuable acquisition in districts where the straw is required for sale, or any other particular purpose. Price £30. Highly commended for the excellency of workmanship.

A portable thrashing machine, fitted with straw shaker and screen, for steam; invented, improved, and manufactured by the exhibitors. Prizes were awarded for this machine at Norwich in 1849, £25; at the Great Exhibition in 1851, included in the award of the Council Medal. This machine is adapted for thrashing grain of all descriptions in large quantities. It is fitted with a screen for the purpose of riddling away loose ears, short straws, rubbish, and calder from the corn and chaff; and with a registered straw shaker for separating the corn from the straw, which is by this means done more effectually than by the usual process by hand. The whole of the machine is mounted on travelling wheels, and conveyed from place to place with two horses. Price £60.

All these machines are so well known that it does not require our voice to be raised to spread their far-famed worth.

We were much pleased with the arrangement of Messrs. Garrett's fixed thrashing machine and complete set of barn machinery.

We were also pleased with their steam engines, one of which was commended by the judges, which tells of their excelling in some valuable points. We noticed some good chaff cutters, beautifully made; also linseed and grain crushers upon good principles. For the best linseed cake crusher the prize of five pounds was awarded. This is a powerful machine for the purpose of breaking cake of any size or thickness. It is fitted with two sets of barrels, which may be adjusted as required, to break cake into different sized pieces for bullocks or sheep, or powder for manure. A screen is fixed between these barrels, through which as much of the cake as is sufficiently broken in passing through the first is sifted in order to ensure uniformity of size, and avoid the unnecessary labour occasioned by that which is sufficiently broken passing through the bottom rollers with that which is not. Price £10 10s. We also observed a powerful machine for crushing linseed and all sorts of grain.

Messrs. Garrett are also joined with Messrs. Ransome and Sims in bringing the American automaton reaper to suit the crops and farming of Britain, which must be accomplished by them if there is any possibility of doing so. We wish them every success in this laudable undertaking.

Messrs. Garrett have also greatly improved their Hussey reaper since last year; it cut well at the trial, and is selected for further trial at Pusey in competition for the prize.

They are also the exhibitors of an excellent cheese turning apparatus, manufactured by John Strutt, Esq., of Belper, Derbyshire. This machine reduces labour to a minimum, economises space, preserves the state of the cheese, and insures a dry bed for the cheese every time it is turned; also the frequent turnings improve the quality of the cheese. Price, with twelve shelves, £12 10s.

On the stand of Mr. Charles Burrell, of Thetford, we were gratified with the great improvement he had made in his portable steam engine; also his portable combined thrashing machine. This machine is fitted with an improved double action box shaker, covered with perforated plates; it has a hopper fixed for delivering the corn after winnowing, and is adapted for steam power. Diameter of drum 20 inches, width of ditto 4 feet 6 inches; number of revolutions per minute 1,050; diameter of driving pulley 5¾ inches. It is fitted with wooden wheels for travelling. Price £70.

Also his portable saw bench, combined with a machine for making gates, hurdles, and fencing, out of any sort of timber, large or small, invented by Walter Palmer, of Southacre, improved and manufactured by the exhibitor. Awarded a silver medal at the Royal Agricultural Society's Meeting at Norwich, 1849. It is fitted with an apparatus for boring and morticing at the same time, which is adapted for morticing hurdle or gate heads, and by which the five mortices can be made in two minutes, and two men can complete a hurdle in a quarter of an hour. An extra frame is also supplied to put them together upon. It is adapted for steam or any other power. Price, with extra frame, £38; with shafts and travelling wheels, £45.

He has again brought forward his long tried and effective gorse cutter and bruiser, which also answers as a universal corn and seed crusher. This is a very effec-

tive gorse preparing machine, and does great credit to the talents of the maker. Price only £35.

On Mr. James Chadnor White's stand we were greatly edified in the way of how all sorts of carriage and gig harness ought to be fastened, so as to prevent breakage; and we quite agree with the judges in the commending of Mr. White's fastening to the consideration of all masters of harness horses.

We noticed on the stand of Mr. Comins, of South Molton, Devonshire, a one-way or turnwrest plough, which worked well in the field at a shallow depth, and answers well as a potato moulding-up plough. This is a simple implement, and worthy the attention of these farmers who desire to lay their land down after the turnip crop perfectly level, which on dry soils is very desirable. This plough may be worked on all sorts of land, hilly or plain; but they are particularly recommended for hilly land. The share turns over at every end of the furrow, and the coulter and mould-plates change at the same time; which is done by a lever between the handles in less time than the horses take in turning round. By the share turning over at the end of every furrow, it is sure to wear to a good point. The great advantage in this plough is, that it leaves no furrows; which cannot be done by common ploughs. Price £4 10s.; if not required for earthing-up potatoes, &c., 10s. less.

Mr. Comins also exhibited a very simple and useful horse hoe, which works with three broad shares when used as a weed extirpator, and with five chisel-pointed coulters (which are well arranged) for the thorough breaking up and pulverising between all sorts of root-crops sown upon the ridge or drill systems.

On Messrs. Winton and Son's, of Birmingham, stand we were treated with the sight and the liberty of testing an assortment of farm hand tools, combining immense strength with the most extraordinary lightness, also the greatest hardness with great elasticity. Their digging forks are all forged out of a solid piece of cast-steel, the whole made without any welding, therefore every part is perfectly sound; but the extraordinary feature is the temper Messrs. Winton give to all their tools, by which they retain their edge although knocked against the hardest substances, without flying or turning the edge either. We split a piece of granite into pieces with one of their spades, and afterwards found the edge perfectly the same as if it had never been used. We also tried to break or bend some very light digging forks, but could not by any fair means strain or break them in digging up old grass land. We are convinced that in filling farm-yard manure and spreading there is twenty per cent. saving in manual labour; therefore every farmer is largely interested in these implements.

We would call attention to some four-tined forks, for shaking up straw away from machine or flail, so as to separate the grain from the straw.

But perhaps one of the most important at the present season of the year was a lot of exquisitely light, yet strong corn and clover cocking forks. These are also used in many parts of England and Scotland for gathering grain that has been cut by machine or scythe into sheaves, for which purpose they are of great value, saving labour and preventing waste. The prize of £3 for the best set of hand instruments used in drainage was awarded to Messrs. Winton and Sons.

We may as well mention that these gentlemen make every sort of hand tool and instrument, edged or otherwise, required in agriculture, all of the same style and quality. Also breast or paring plough-blades so well tempered that their edges do not turn nor gap in gravel, although they are light and low in price.

On the stand of Dray and Co., Swan-lane, London, we saw some capital engines, both portable and fixed. We cannot pass without giving our meed of praise to their six horse-power fixed engine, which was beautifully designed and well made, upon sound principles, and beautifully finished, and therefore justly commended by the judges. After passing some winnowing, blowing, thrashing, and chaff cutting machines, all of good make and description, we came again to their improved Russian machine, which improvement consists in a more simple and desirable arrangement of the machine with a tilting platform, which saves the man a great deal of hard work in heavy crops by the facility it gives him in delivering the cut crop on the land. They also exhibited in junction three gathering forks, admirably adapted for taking the cut crop up out of the way of the horses, and laying it in bands ready for binding, which effects a considerable saving of labour and waste of grain. These are also well adapted for gathering corn lying in swathes into sheaves or cocks, as may be most desirable according to climate.

We would call the attention of those interested to a churn invented and manufactured by A. Willard, which is calculated to effect the whole operation of churning, washing and moulding the butter without handling. This, if possible, is much to be desired, as it is certain that there is a large amount of invisible perspiration continually flowing from the pores of the human skin, that, when mixed with butter or anything else, must hasten decomposition; therefore rancidity in butter much handled.

These gentlemen also exhibited Anthony's, Mr. J. Dalphin's American, and the Sussex churns, &c. They also showed some excellent compound lever presses for cheese-making. No cheese dairy should be without these.

They also exhibited a number of American ploughs and other foreign implements, from which we may learn a useful lesson.

Their screw lifting jack is a most simple, light, and powerful instrument for lifting great weights, at the moderate price of 60s., and was properly highly commended by the judges.

Their grinding stone, driven by a treadle, is a capital thing, answering its purpose well: cheap at 60s.

This firm also exhibited a variety of ploughs, harrows, rolls, cloderushers, carts, waggons,—in fact every description of agricultural implements, selected from all the best makers.

Also a great variety of garden seats, possessing great ornamental elegance combined with utility for the purposes intended.

Also garden pumps, and Budding's patent lawn mowing machines, with all the varieties of garden tools selected from the best makers.

They likewise showed a variety of capital wire fencing, invented and manufactured by Musgrave and Co. This is a firm description of wire fencing, made upon a good principle for combining strength, both vertically and laterally, with the least liability to get damaged by any sort of animals, as the top is made, or rather finished, with pointed wire of irregular heights, which also renders it capital fencing against fowls, as they do not like flying over it; and invaluable against such vermin as hares and rabbits. Price 2d. per square foot.

We were much pleased with a self-adjusting gate, constructed of iron, with a self-adjusting fastening, which is made to swing to its centre with unerring precision. This is on a capital plan, and moderate in price.

They also introduced a washing, wringing, and mangling machine, invented and manufactured by the exhibiters. This machine is apparently well calculated for the purposes intended.

Mr. Scoular, of Haddington, exhibited some very simple, efficient, and cheap two-horse grubbers, that are universally used in East Lothian.

Messrs. Smith and Ashby, of Stamford, exhibited their patent hay making machine with double action. This machine has been so long known as the champion of the world for the purposes intended, that it is out of our power to speak too highly of its great merits; and whether the Royal Agricultural Society of England have awarded it a medal this year with the intention of calling the attention of the Council to it, that they may, with the advice of their able engineer, award these gentlemen a gold medal for their hay making machine, as an implement that is now perfect, we know not; but when we look at the various reports of judges, who all express themselves satisfied that it may be equalled but not excelled, at least they have got so far in advance of all others that they are entitled to some extraordinary mark of distinction. This implement has from its first exhibition obtained the prizes of the Royal Society, and been invariably noticed (see the Reports of 1846, 1847, 1849, and 1850). The following are some of the advantages possessed by this machine:—It has been greatly increased in strength, durability, and lightness, weighing much less than other haymakers, consequently the labour of the horse is very considerably reduced; these improvements have been secured by the substitution of wrought iron for cast. The machine is mounted on S. and A.'s patent wrought iron wheels, and it is fitted with great care and exactness in the gear work. Each tine box is fixed upon double wrought iron bearings, and being furnished with two steel springs instead of one (a patent improvement, peculiar to this machine), it is capable of throwing the heaviest crops of grass without clogging, to which all other implements of this kind are liable; and it can be worked on the most uneven ground without the least danger of breaking. Another great advantage is their improved method of fixing the shafts, whereby the weight on the horse's back is decreased by at least four stone. A further advantage in this haymaker is the application of a spring lever, by which the action of the machine can be instantaneously reversed, and thrown in or out of gear without inconvenience, delay, or danger to the attendant. The rake barreis are raised from or lowered towards the ground, and set at any height required, by means of a winch or handle on the front of the machine.—N.B. The Report of the judges for 1849 says: "We found that in this class of implements there was practically no competition, as Smith and Co.'s machine was very superior to any of the others in all its parts and performances of work; in fact, we think it so near perfection that no one need fear buying under the impression that any great improvement will take place in its construction in future. We regret to say that all others fall into the shade when brought into competition with it" (see Journal, vol x., part 2, No. xxiv., 1849, p. 546). And again in their Report at Lewes, 1852: "Smith's haymaker, Stamford" [misprinted "Kettering," in the Report], "was again victorious. The simplicity of the contrivance for reversing the motion is very elever" (vol. xiii., part 2, No. xxx., 1852, p. 346). Price £14 14s. at Stamford.

They likewise exhibited their well known horse rake: the merits consist in being made entirely of iron; adapted for hay, corn, stubble, twitch or couch, and light scarifying purposes. The advantages of this implement are its lightness, strength, and the simplicity and power of its leverage, by means of which a boy can work it, without stopping the horse. Another important advantage is the method by which this rake delivers the hay: the teeth being placed outside the frame work, and being formed in a gentle curve, they sweep their whole length over the back cross bar of the frame, when raised from the ground, whereby they cannot fail to clear themselves of their load, without the aid of any apparatus for that purpose, and without clogging; and at the same time the hay or corn is deposited in rows in a compact manner.

They also showed a variety of their chaff engines, which are well known for their durability, expedition, and stability for steam and horse power. The merits of these are well known by a large majority of the Lincolnshire farmers as first-rate machines.

We were much pleased with a park or luggage cart shown by these gentlemen. It is a neat, convenient little cart, quite the thing for jobbing about a gentleman's lawn and park.

Mr. Brinsmead exhibited a straw shaker of great merit, which might with great economy be used as the deliverer of the straw upon a stack of considerable height, a purpose to which it is destined to be applied before long. It is perhaps unrivalled as a straw shaker, while it performs, secondly, the office of a straw elevator; thirdly, it conveys the grain and chaff into the riddle, and takes them away with the long straw. This is a simple, inexpensive, and efficient machine, well meriting the medal awarded to it.

On the stand of Messrs. Hornsby and Son we, as usual, met with that high standard of material and workmanship for which the firm is so celebrated. In engines they were not so fortunate as usual, having lost the first prize; but they were an extraordinary close second with their portable engine, and got commended for their fixed engine of eight-horse power. It is but fair to state that they had an accident with their portable engine, and had one of the connecting rods broken, which had to be repaired at Gloucester: this acted greatly against them. With thrashing machines, as usual, these gentlemen were close competitors, and were commended for their portable four-horse thrashing machine. Messrs. H. and Son have again carried all before them with their winnowing or corn dressing machine, taking the prize of £5 for large occupations, also that for small occupations of £5. In these machines they are not equalled, and have not been for many years. In the drill department these gentlemen, as has been the case for years, are only equalled and occasionally excelled by Messrs. Garrett and Son. At this meeting the latter gentlemen have had a lion's share of the prizes, while Messrs. Hornsby and Son have the high commendation of the judges for their general purpose drill, also for their turnip and mangel wurzel drill on the flat. Messrs. Hornsby and Son have again carried away the palm of merit for their patent corn and seed steerage drill. It is suitable to all methods of cultivation, will work upon any soil, and deposit corn or seeds at any distance apart, being particularly well adapted for drilling on the side of hills or other hilly ground, as well as on the level. The patented improvements are the corn and seed-box being supported in the centre, and by means of a screw at one end they can be raised or lowered endways as the drill travels; so that the box is kept quite level when the drill is travelling on the side of a hill at an incline of one foot in six, ensuring as regular a delivery of corn or seed as if travelling on perfectly level ground. It has the patent India-rubber tubes for conducting the seed to the coulters. Also another improvement consists in the drill having two coulter bars; by this arrangement the weights upon the ends of the levers have exactly the same pressure upon every coulter, thereby depositing the seed at an uniform depth. The advantages of R. H. and Son's patent India-rubber tubes over the tins are now well known, having been extensively used for three years. It must be admitted that the seed is first delivered from the cups with the greatest exactness; therefore the only reason

why it reaches the ground so irregularly or frequently in patches is the imperfect delivery the tins afford; the very motion of the drill and even the form of the tins causes the seed to be thrown from one side to the other, bounding and rebounding until deposited in the soil; whereas the patent India-rubber tubes do away with the number of tins, which are composed of cups working within each other, and substitute simply a continuous tube, through which the seed directly passes down, protected both from wind and rain; even the most boisterous day cannot possibly affect the seed, as it passes with the greatest regularity into the channel made by the coulter. To this drill is fitted R. H. and Son's improved patent forecarriage steerage; previous to R. H. and Son's patent, the forecarriage steerages in general use required so much labour to hold them, that when the whole came in contact with a large clod or stone, a strong man could not possibly prevent the drill from swerving; to obviate this defect, R. H. and Son have introduced their patent rick and pinion, obtaining great leverage, and a strong boy's command over the drill is so great that the wheels coming in contact with stones or uneven surfaces has not the least effect upon the steerage, which passes over almost imperceptibly. Price £25. The perfections of this drill are so fully demonstrated when at work, that even the labourers are universally enamoured with its performance. These gentlemen took the prize for the best turnip and mangel wurzel drill on the ridge. With this drill they have long been unrivalled; indeed, its merits and use are so widely known, that it would be superfluous for us to say more of its merits here. We must not pass over their oil-cake breaker, the power and excellence of which are now well and practically known. Also their profitably known blower or corn rectifier, which increases the value of grain largely, while it reduces the bulk but insignificantly, and ought to be better known to the farmers of England. Also their barley hummeller or horner, which is a most efficient machine for rubbing off the horns from barley. This is an invaluable machine to barley growers.

On Mr. Scragg's, of Cheshire, stand we observed his celebrated hollow brick and draining tile machine; also some bell-mouthed tiles that fit into each other, as a superior plan to collars; also some hollow bricks with a flange to them, that slip over each other, for the purpose of making arch roofs on buildings, saving both timber and slates.

On the stand of Mr. Wm. Ball, of Rothwell, Northamptonshire, we observed his justly celebrated plough that has so often taken the general purpose plough prize; but this year he took the prize with it as the best strong land plough, being best calculated for deep ploughing; therefore if deep ploughing is a token of good farming, all good farmers ought to use Mr. Ball's plough. He also exhibited a useful waggon, exceedingly well made; likewise a capital two-horse grubber of considerable merit, and especially worthy of the notice of light-land farmers.

On Mr. East's, of Spalding, Lincolnshire, stand we saw a patent dropping machine; invented and manufactured by the exhibiter. This machine is so constructed that it will deposit at any required depth or distance, either in the width or in the row, one bean, or any given quantity of any description of seed. It consists of a carriage, upon which is mounted a box to contain the seed to be deposited in the ground: at the bottom of the box are pipes which convey the seed into the depositors. The front bar is made to revolve by means of a cog-wheel attached to the nave of the travelling-wheel, on which is placed an intermediate wheel, worked by a lever on the top of the frame, that will take the whole machine out of motion in an instant. The depositors are circular iron boxes attached to the beams and coulters: each iron box or depositor contains a circular iron plate, containing 28 holes, which revolving amongst the seed, takes it up and delivers it into a wheel containing a corresponding number of partitions, that empty themselves as they arrive at the mouth of the depositor. The depositors are turned by a drag-chain, which can be taken out of gear in an instant, and can also be put into action again, by a simple lever attached to the depositor—a great advantage where goring is required, as the machine will deposit seed as soon as it is put in action. Price (with two sets of plates, for sowing beans, peas, wheat, oats, and barley) £10. This machine has great merit, and is likely to become extensively used where dibbling is much practised, as it is the same thing carried out by a different process. We were pleased to find the judges had highly commended this machine, as it was well worthy of their approbation.

Messrs. Howard, of Bedford, exhibited their well-known plough and harrows—the latter carried away the light-land prize: their heavy-land harrows were commended. Also a double ridge plough was commended. Likewise Howard and Bentall's patent plough shares were commended. These gentlemen took the prize for the best subsoil plough, an improvement upon Gray's plough, of Uddingston, near Glasgow. They also took the prize for the best horse hoe on the ridge, with an improvement upon Busby's horse hoe, which consisted in merely attaching two wheels in front, two or three feet apart, which made it go along much steadier.

On the stand of Messrs. Barnard and Bishop, of Norwich, we observed a variety of garden seats and chairs, wire fencing, sheep and rabbit-proof hurdles; also a variety of dog and pig troughs, one of which was justly commended by the judges, as it is low in price and large in its accommodation.

We were much pleased with a cottage mangle, at the low price of 70s., that is well calculated for the purpose intended; this was properly commended by the judges, as it had about it something like mangling for the million in its power and price.

Messrs. Mapplebeck and Lowe, of Birmingham, exhibited a large number of the most useful tools, machines, and implements manufactured by some of our best makers; and they were highly commended for the draining tools exhibited by them, and made by W. A. Lyndon, of Birmingham.

On the stand of Mr. Hugh Carson, of Warminster, we noticed Moody's root-cutter. This machine is particularly adapted for cutting up all sorts of bulbous roots into thin shreds for mixing with chaff, and is well worth the attention of cattle feeders. This is not the first show at which this machine has called forth the highest commendations of both judges and visitors.

On the stand of Mr. J. Gillam, we were much pleased with the performance of a machine for cleansing and separating rye grass, flax, and cinquefoil seed, invented by the exhibitor, and manufactured by Barnett and Exall, of Reading, Berkshire. The machine consists of two sieves, worked by means of cranks, and driven by gearing, over which the seed is passed, dividing the samples, which pass out at spouts fixed under the bottom of the sieves. The sieves may be arranged at any suitable angle, according to the condition of the seed. The hopper is supplied with a shaking apparatus and with slide to regulate the quantity passing on to the sieves. The whole of the work is fitted in a wood frame, and bolted in wrought iron. Price £15. This machine, had a silver medal awarded to it, a mark it well deserved.

Mr. Charles Hart, of Vale of White Horse, Wantage, Berks, exhibited his well-known cultivators, which were commended by the judges; also his combined thrashing machine, which carried away the prize. We thought

that there was too much oscillation in this machine when at work, which must act severely upon its wearing powers. It did its work exceedingly well.

On the stand of Mr. G. Hancock, of Sanbach, Cheshire, we were much taken with a churn having two dashers or beaters, the axles of which are perpendicular, and revolve in the same direction. These, when in motion, produce by their centrifugal force two circular currents, which cross each other in their action. This was properly commended by the judges.

Messrs. Gower and Son exhibited an excellent drill for sowing two ridges of turnips or mangel wurzel. This drill deposits the seed by means of cups, similar to the corn drills. The quantity of seed per acre can be varied from 1 to 6lbs. It is fitted with iron concave rollers, which are self-adjusting, to accommodate themselves to ridges of different widths, keeping the coulter always on the middle of the ridge. It has also a very simple means of adjusting the depth, and has a light roller attached to cover the seed; it therefore performs the three processes of rolling, drilling, and covering the seed in one operation, and is drawn by a horse or pony. Price £5.

On the stand of Messrs. Hensman and Son, of Woburn, Bedfordshire, we observed his well-known and appreciated steerage drill for eight rows of corn or any other seed. The corn-hopper of this drill is self-acting, and will deliver the seed equally up and down hill: this drill has great power to penetrate hard ground; it is very easy of steerage, by which it may be guided with the greatest precision; it is fitted with a box for turnips, mangel wurzel, and other seeds; the quantity is regulated by cog-wheels, and may be drilled in rows from 6½ to 30 inches apart; clover seed may be sown broadcast same time as drilling barley; it is convertible into an excellent horse hoe, by attaching hoes to the levers in place of the coulter shares. Price for corn, £19; corn and turnips, £20; corn, turnips, and other seeds, £21; extra for iron levers instead of wood, £1. The contrivance of altering this to a horse hoe is so very simple, and the power of steerage so good, that we think the small farmer may hail this machine as a boon; and the large farmer must not shut his eyes on it if he studies his own interest. We also observed one, two, and four-horse power thrashing machines of great merit, and moderate in price. These gentlemen continue to stand high as thrashing machine makers.

Mr. Thomas Huckvale, of Chipping Norton, Oxford, again exhibited his little turnip thinner and horse hoe combined, for the ridge. This is a capital little implement, which hoes each side of one row of turnip, mangel, &c., at the same time thinning out the row into bunches any required distance apart. This machine was exhibited at Liverpool in 1841, and got a prize of £3, and has been used ever since in various parts of the kingdom.

Messrs. Robert and John Reeves, of Bratton, Westbury, Wiltshire, again carried away the prize for the best liquid manure and seed drill. This is an excellent and efficient drill, of great value in dry seasons, especially with the mangel wurzel and turnip crops, insuring a good braird under all circumstances; and the speedy growth of the plants enables them to get away from the fatal ravages of the fly. This drill was awarded Mr. Pusey's prize of £10.

Messrs. Tasker and Fowle, of Andover, Hampshire, were highly commended for their liquid manure and seed drill. This is a very complete machine, and worked beautifully, but the price told against it.

Mr. George Bell, of Inchmichael, Perthshire, exhibited a general purpose drill, possessing considerable merit, for working on land without furrows; but where the farming is rough it must fail.

Messrs. Smyth and Sons, of Peasenhall, Yoxford, Suffolk, and Witham, Essex, exhibited a large number and variety of their long-celebrated and justly-esteemed drills of all sizes and sorts, which, for simplicity of construction and moderation of price called forth the high commendations of the judges and the general approval of the agricultural public, by large orders given for these simple and efficient drills, especially their small occupation drill, which is an excellent machine, and justly received the prize of £5.

We would call the attention of the farmer to their turnip or mangel wurzel drill; for simplicity, efficiency, and lowness of price, it is equal to anything the farmer can desire. This turnip and mangel wurzel manure drill is adapted for three rows on the flat and two on the ridge; constructed on a new principle, with a revolving axle for contracting or expanding the carriage wheels to fit the various sized ridges, and with a newly invented lever slip, or slide, for regulating the quantity of manure per acre; extra set of coulters, for delivering seeds fleet and manure deep, by a portion of soil covering the manure before the seeds descend; and admits of from ten to two-hundred bushels per acre to be drilled. Price £8 10s.

We were also much pleased with a broadcast corn and seed sowing machine, invented by Captain Kammerer, of Prussia, improved and manufactured by the exhibiters. This machine distributes the seeds upon the surface of the soil with the greatest regularity, and however small the seeds may be, thereby preventing the possibility of even two seeds falling together. Price £12 10s.

Messrs. Burgess and Key, of Newgate Street, London, exhibited a large and well-selected assortment of agricultural tools, implements, machines, and engines, manufactured by some of our best makers; also a series of force pumps, of various sizes and powers and prices, manufactured by the exhibiters. We would especially call the attention of farmers to a force and lift pump, or farm fire-engine; invented by Kase, of America, and improved and manufactured by the exhibiters. It is a most powerful pump, and suited for a liquid manure pump or farm fire-engine: the barrels are 6 inches diameter; and with four men a jet of water may be forced 60 feet high through a ¾ inch jet. Price, on stand, £14 14s. This engine, and Crosskill's liquid manure cart, would make a very complete fire engine, and very portable, which, by timely application, might save a vast amount of valuable property. Also another of Kase's pumps or engines, on the same principle, suited for one or two men. This is an excellent and efficient garden watering engine; also capital for washing windows and fronts of houses, &c. This is moderate in price, £8 8s.

We would likewise call attention to a portable pump, improved and manufactured by these gentlemen. This pump is made of galvanized iron, with the bottom valve formed with a gutta percha ball. The legs of the tripod stand fold up, which makes it very portable, and useful as a liquid manure pump, especially where a number of tanks are used. The price being low, £3 3s., brings it within reach of all farmers.

These gentlemen also showed a great variety of sizes of Anthony's churns, made of beautiful material and excellent workmanship.

We were greatly interested with a portable gas-making apparatus, of vast importance, as it has long been a great consideration. To produce an economical, safe, and portable gas apparatus, for detached dwellings, factories, churches, and other places where the gas of commerce cannot be obtained, has long been much sought for. The apparatus is the invention of an ingenious mechanic, who has lit up his own premises with it for two years

past. It is constructed on a very small scale, consisting of furnace, retort, and vessel for purifying; the whole occupying a space of not more than eight feet square. The material used for making the gas is the refuse of the kitchen, such as grease or fat of every description, it matters not how dirty, as the whole is burnt off in the retort; it produces a brilliant white light, far surpassing any gas made from coal. The apparatus is not at all expensive, consisting of only three vessels, and at the cost of threepence half-penny, will supply sufficient gas for one burner for twenty-four hours. It can be adapted to any number of burners, or by continuing the making, gas can be obtained and burnt for any length of time. To the proprietors of factories and detached dwellings, it presents the opportunity of having a brilliant and economical light, so cheerful in the private dwelling, and so desirable in the workshop. To the colonist, who has mutton fat *ad libitum*, it must be quite a *desideratum*; and the Cape sheep farmer, whose sheep-tail fat will produce a light of unequalled brilliancy, might illuminate his distant dwelling, at a mere trifle. In South America, where they use fat lamps giving forth a smoky, dull, flickering glare, its presence would be hailed with delight; in short, wherever the gas of commerce cannot be easily obtained, this apparatus will be used. Its construction is so simple, that any lad after a short instruction could take it in charge; one is to be seen in daily operation, at Burgess and Key's, 103, Newgate Street. An apparatus which will cost, complete (inclusive of fittings-up), £12 12s., will produce, from 1½lb. of kitchen stuff and one pennyworth of coke, or 3½d., in about one hour, about 12½ cubic feet of gas, which will light as follows:—

Single jet burner, equal to three mould candles			24 hours.
Or four burners, equal to twelve candles, for		6	,,
First size fish tail	6d.	18	,,
Second size ditto	8d.	12	,,
Argand, 28 jets	16d.	6	,,
Ditto, 20 ditto.....	20d.	4½	,,

Other burners according to size. Large apparatus made to order.

They also exhibited their M'Cormick's reaper; the great merits of which are now so public that we can add nothing farther, until the great trial at Pusey decides the palm of merit, when we think it will not be far from the prize. But time will tell.

We observed a well arranged sawing and boring table, manufactured by Mr. B. Samuelson, of Banbury. They also exhibited a variety of most excellent hose, made both of gutta percha and canvas, with jets and spreaders, all of the greatest importance in this age of the profitable employment of the sewerage of our towns and cities, which we hope to see progress with rapid strides, so that the chief cause of all the fevers and malarias that pervade our land may be converted into the strengthener and sustainer of life, spreading comfort and happiness instead of pestilence and disease throughout our land.

On the stand of Mr. Bernhard Samuelson, the successor to the late James Gardner, of Banbury, we saw a number of his widely known turnip cutters, that have reigned so long without a rival, and still keep on receiving the prize of this society as usual this year.

On this stand was exhibited that machine which has created so much excitement amongst farmers, namely, the digging, or rather forking machine. It consists of seven series of slender steel prongs, so shaped in curve and section as to penetrate the soil easily by the mere weight of the framing which contains them; each series being bolted between iron plates, and resembling the spokes of a wheel without the tire, and all the wheels being caused to revolve by the draught applied whilst embedded in the earth. The spokes or prongs bring up the soil, and allow it to fall backward thoroughly pulverized and mixed—in a form not unlike the back-water from a paddle-wheel; leaving the couch-grass and other weeds on the surface, so as to be easily picked or raked off. In the upper portion of their revolution, they pass between a corresponding number of iron bars, which scrape away anything that may adhere to the forks. It covers a breadth of three feet, and can be regulated to dig to any depth not exceeding ten inches; and with three to seven horses, according to circumstances, is capable of digging from 4 to 5½ acres per day. Price, at Banbury, £27 10s.; at Gloucester, £29. We passed some remarks upon this machine when reporting of its working powers, which we are of opinion will be greatly improved, when it will bid fair for superseding the plough in many cases. There is great credit due to Mr. Samuelson for the enterprise, ingenuity, and mechanical talents he has displayed in the manufacture of this machine; and we rejoiced when we heard that a silver medal was awarded to this implement.

He also exhibited one of M'Cormick's reapers, which is well made, and worked well, and was one of those selected for trial at Pusey for the prize of twenty pounds, where we think that it will perform so as to do credit to the maker.

Mr. Samuelson also exhibited Anthony's churns, Kase's force pump, and a bundle of Chandler's patent hoes, by the aid of which boys and females can be economically employed in hoeing all sorts of crops.

He also exhibited some well made Budding's lawn mowing machines, with Samuelson's registered improvements. The economy of labour by the use of this machine, as compared with the scythe, is at least five to one. It can be used at all times of the day, and in the driest weather. The improvements are in the arrangements and mode of grinding the spiral cutters, in the substitution of a pair of wheels for the wood roller (which latter, however, is retained for use in mowing between small borders), and in the means of regulating the length of grass left on the lawn. It may be drawn either by a man or a pony. Price, with draught-links complete for pony, £7 5s.; for hand-draught, £6. The value of these machines is well known to all gardeners throughout the kingdom.

On the stand of Barrett, Exall, and Andrews, we observed their plain, useful, efficient, and moderate priced portable and fixed steam engines; their portable engine was commended, and their fixed one obtained the second prize of ten pounds. This speaks more than we can do for them.

They also exhibited their thrashing machines, both for steam and horse power. Their four horse power was highly commended for the manner in which it did its work, being superior in that respect to all other competitors that came under the notice of the judges. Their two horse power thrashing machine also worked capitally.

They also exhibited a series of their paragon or universal mills, which are extensively used, and in considerable demand throughout the country.

They also showed a number of excellent chaff cutters, and seed and corn bruisers.

They exhibited their gorse crusher or bruiser, which is a most efficient and powerful machine, well made, and in great demand for the purpose intended. This machine obtained the Society's prize at York, also at the Society's Meeting at Norwich, of £5 each time, and was commended by the judges at the Great Exhibition; also obtained £5 prize at Lewes. It first cuts the gorse as chaff by means of five knives fixed on two rings or

heads; it then passes through two sets of rollers, running at two speeds, which by heavily compressing and rubbing the gorse as they pass it through, reduce it to a condition suitable for the food of cattle. Since it gained the prize at Norwich it has been improved by putting more knives upon the cylinder to cut the gorse shorter before it passes through the rollers. It is also strengthened in various parts, and some better adaptations have been introduced for facilitating its works. It can be applied to either horse, steam, or water-power. Three horses will cut and crush from 250 to 300 bushels of gorse per day, if it be young. It requires three horses to work it 99 revolutions per minute. It is driven by a connecting-rod attached to a fly-wheel 4 in. diameter; weight 1 cwt. 3 qrs. Price, if fitted with strong wrought iron lever, £26 14s.; but if fitted with cast iron lever, the mill is £3 less.

They also showed a great variety of their ploughs, harrows, and rollers, that are suited to the wants and usages of particular localities: these ploughs are well known and esteemed for their draught.

We were much pleased with the working of their horse rake, especially the perfect arrangement by which it cleared itself of the material collected upon it, as well as the simple, efficient, and easy worked lever power for raising the rake for the purpose of clearing it. This is a good implement, made upon first rate principles.

On the stand of Mr. Busby, of Newton-le-willows, Bedale, Yorkshire, we were taken with the novelty of a waggon, curiously placed on the wheels, invented and improved by William Lister, Esq., of Dunse Bank; and manufactured by the exhibiter. An obvious improvement, it is presumed, has been effected in this waggon, particularly as to the draught and ease of the horses: the hind wheels being high, a great part of the waggon body is thrown upon them; which plan, it is contended, will save one horse in four over ordinary waggons—(see the advantages the best omnibuses derive from carrying out this principle, contrasted with London waggons, which in every way oppose common sense and mechanics)—the low fore wheels consequently have only a small share of the load, which is a great advantage to the shaft horse, as there is less tendency to dash the shafts against him in rutty roads. The horses can also turn with much more ease under all circumstances. The soles of the waggon are strengthened over the axle of the hind wheels, where the weight ought to be put when practicable. Price £26; with patent double break £3 extra. If Mr. Lister is right in his views, it is evident that the two front wheels must be so much lumber drawn about, more for ornament than use. However, we leave that to the thinking public; we are of opinion that few will agree with Mr. Lister in his extraordinary ideas. Mr. Busby has done every justice to the principles of this waggon, first rate materials and workmanship being used in its construction; but whether the bad mechanism of its principles will hasten its destruction time alone will demonstrate.

We were pleased with the carts exhibited by Mr. Busby; they are now widely known and appreciated by the users of them; they are simply made. The body is made of planks, upon the most simple and durable plan, and is at once laid on the axle as low as will allow of being tipped. The shafts are placed on the side of the body, which plan gives greater strength than the old method, besides the proper line of draught being thereby attained. The naves of the wheels are made of wood instead of iron, which renders them more durable, and repairs are more easily made. Tire, 4 in. Price £12 12s.; with harvest shelvings £2 extra.

Mr. Busby of course exhibited his plough that has gained so many prizes at the various agricultural meetings these several years back, and this year again as the best general purpose plough. Also his horse hoe, which has always taken the prize, whether in his hands or those of some one else. In Mr. Howard's hands this year it came off victorious, Mr. Busby's own being commended.

He also exhibited one of Tennant's two horse grubbers, a capital little implement, and moderate in price—£5 5s.

Messrs. Clayton and Shuttleworth, of Lincoln, exhibited, as usual, several portable and fixed steam-engines. They have long, with great energy, ingenuity, perseverance, and industry, striven to carry away the first prizes of the Royal Agricultural Society, which they have this year accomplished, both for the portable and fixed steam-engines, receiving the palm of merit and £20-prize in both cases.

They also exhibited their combined fixed thrashing-machine, and carried away the prize of £20. This is a most compact and complete machine. It is constructed to thrash all kinds of grain, and in one operation (in addition to thrashing) cleans, finishes, puts into sacks, and weighs it ready for market. It is composed of the following parts, viz.: one line of bright shafting, running in brass bearings, with all the necessary driving pulleys, bored, turned, and keyed upon the same; a thrashing, straw shaking, riddling, and winnowing machine, complete upon one frame; a set of dressing and cleaning apparatus, in two parts; two sets of elevators, to elevate corn and tailing into cleaning apparatus; and a weighing machine with weights complete, attached to the finishing machine. Price, exclusive of carriage and fixing, £150.

They likewise exhibited their portable combined thrashing machine, which is well known throughout the kingdom for its efficiency and durability under the title of Clayton and Shuttleworth's patent combined portable thrashing, straw shaking, riddling, winnowing, or chaff separating machine; invented, improved, and manufactured by the exhibiters. The patented improvements in this machine consist in an arrangement for separating the chaff from the straw and pulse, which it accomplishes in a most perfect manner: a very desirable object to attain, as most agriculturists admit that clean chaff is very valuable as food for horses and cattle. It is intended for steam or water power; driven by a strap over a pulley fixed upon drum spindle. It is fitted with elevators for carrying up the spoutings to be passed a second time through the dressing part of the machine, thereby saving the labour of one man, and ensuring the work being much better done. This machine delivers the grain through a spout, so far finished as only to require in most cases once passing through the dressing machine to render it fit for market, performing in one operation the duties of four separate machines, thereby effecting a considerable saving of labour over the old mode of thrashing. Price £80; if with wood wheels £5 extra.

Mr. Coleman, of Chelmsford, Essex, exhibited a number of his cultivators or scarifiers, of various sizes, all of which are becoming daily more widely known as most excellent implements of their kind. His four-horse cultivator was commended for its particular efficiency when crossing high-ridged lands.

His two-horse scarifier and cultivator was awarded the prize of £5 as the best in the yard, after a severe trial.

His expanding harrows were tried, and did their work exceedingly well; but they seem to require some improvement in the attaching of the horses to them, so as to give the principle of the harrows a fair chance of showing forth the merits of this excellent implement.

We were pleased with an oven, or rather a universal cooking apparatus, exhibited by Mr. Coleman; it is a newly-invented patent economic oven; invented by Michael Fitch, of Chelmsford: manufactured by the Chelmsford Oven Company. In this oven the heat is by a traversing principle detained and equally diffused throughout a series of chambers, in which baking, boiling, and roasting may be performed at the same time, at less cost for fuel than any before known. Price £12.

Messrs. Fowler and Fry, of Bristol, exhibited their carts, waggons, corn and seed drills, liquid tanks, horse hoes, hay rakes, chaff cutters, and cake breakers, all of a useful description. Also a brick and tile machine of great merit, which we were pleased to find the judges had noticed by their commendation. This machine is worked by horse or steam power. The clay is propelled through the dies, and at the same time pugged by two revolving worms working in a cast-iron cylinder. A self-acting cutter is affixed before the mouthpiece, the action of which depends on the rate at which the pipes or bricks pass out of the machine, thus ensuring equal lengths being cut off without stopping the machine. Price £60.

They also exhibited their draining plough, which we have seen making excellent work, but was not present at the trial at Gloucester. The machine in its present state consists of a plough and windlass. The plough is a strong wrought-iron frame, carried on four 4 ft. 6 in. wheels; the front wheels are 9 in., and the hind wheels 6 in. wide. In the centre of the frame is a cast-iron block, carrying the coulter, and the gear for elevating and depressing it; the coulter is a solid forging 7 ft. long, 14 in. wide, and 1½ in. thick. To the bottom of the coulter a conical plug of cast-iron is attached, which forms the drain; the tiles are drawn into the drain slung on a rope attached to the heel of the plug. The axle of the front wheels moves on a pivot in the centre, so that the wheels can be set to follow the course of a furrow when required. The frame hangs loose on the hind wheels, to which a steering lever is attached, which guides the progress of the whole machine. The windlass consists of a cast-iron bedplate, supporting a drum and spindle, to which is attached a cross-head and horse-levers, and is worked by four horses. Upon the drum is wound a wire rope, which is returned round a pulley-sheave attached to the front of the plough, and being set in motion draws up the plough from the opposite side of the field, the drain being formed and the tiles deposited in its progress. The windlass is firmly fixed in the ground by an anchor-plate and strutts. The advantages of this implement are a great saving over hand-labour, and avoidance of injury to the surface. With four horses, four men, and two boys, sixty chains, or above 1,300 yards of 3 ft. 6 in. draining, with the pipes deposited, can be done in a day. In the stiff clays the land is most efficiently drained without the use of pipes or tiles of any kind. Subject to a royalty. Price £180.

Mr. James Cornes, of Barbridge, Nantwich, Cheshire, exhibited a large number of various sizes of his long famed and justly well patronized chaff cutters, which for a long period never were beaten, and has again carried away the prize of £10 for a large machine for horse or steam power. This machine is 12 in. in the mouth, 3½ in. thick, and is applicable to hand, horse, water, or steam power; and makes various lengths of chaff, and two lengths for litter. It is fitted up with the reverse motion and safety registered rollers, whereby the danger of the feeders getting their hands entangled is entirely avoided when the machine is driven by steam or other power at a great velocity. This machine is much used in cutting green food for cattle. Weight of fly-wheel, 1 cwt.; drum 3 ft. 4 in., driven at 160 to 200 revolutions per minute. Price, delivered at Barbridge, £14; if fitted up to cut gorse, £1 extra.

He also took the prize of £5 for the best hand-power chaff cutter. This machine has two knives, and cuts two lengths of chaff; is expeditious, and requires moderate power to work it. These machines are so generally known that we need not waste space by further description.

He showed a curd breaking machine or mill, which is extensively used in the principal dairies in Cheshire. This we have seen in use, and can recommend it to all large dairymen who manufacture cheese, as a labour-saving and efficient mill, superseding the highly objectionable plan of breaking up the curd with the hands.

Mr. Thomas Glover, of Thrussington, Loughborough, Leicester, has again taken away the prize for the best paring plough. This implement has taken the prize for the last ten years in succession, without even a close competitor. It is adapted to pare turf or stubble ground to any depth required, from 1 to 3 inches, and 14 inches wide: it lays the turf in a curl—the best possible form for drying, as a current of air passes down the curl, as through a tube, and the turf is thus very soon in a fit state to burn. This implement may be worked with a pair or three horses, according to the nature of the land and depth required. Price £5 10s.

Mr. Gray, of Uddingston, near Glasgow, exhibited a subsoil plough which was commended for the excellency of the leverage for raising it out of the ground at the land's end, or where occasion required. This plough was badly managed, or it would not have lost the prize.

Mr. Harkes, of Knutsford, Cheshire, exhibited a reaping machine, invented and manufactured by himself. This little machine has some sound common-sense principles about it, and we have no doubt that Mr. Harkes will bring it out as the best reaper for small occupations. It cut well, but failed in the delivery. The means of giving motion to the cutting parts is beautifully simple and effectual; it is on the perfect scissors or clipping principle. We expect to hear more of this machine before harvest is over. He also exhibited some first-rate horse-hoes, potato-raising and paring plough combined, of great merit; also a very good plough.

Messrs. James and Co., of Leadenhall-street, London, exhibited a series of their weighing machines, of all sizes and for all purposes. We should like to see the farmer use these machines in testing the weight of beef, mutton, and pork. Any given quantity of food lies on the body of each of these animals. No farm can be complete without a good cart-weighing machine.

On stand 87 we met Mr. Milford, the maker of the cart to which the prize was awarded. This cart is composed of a great number of pieces of wood morticed, screwed, and rivetted together. The tipping or tilting-rod, or sword projects down nearly to the ground, with the edge towards the horse, therefore well placed for cutting the horse's leg off in case he should commit the misfortune of slipping down during frost or otherwise; it would also be a certain cure for kicking, as it stands right for cutting off the offending member. As a harvest or corn-carrying cart, it is more than ridiculous; being less than five feet wide, it would be of no use to those farmers who grow wheat from five to six feet long, a description of crop the judges cannot be aware ever grows, or they would have given the prize to a cart capable of carrying such home. All we can say is, that if the judges of this season are right, all the judges that have heretofore adjudicated upon carts must be wrong, and all that has been held forth in the Royal Agricultural Society of England's *Journal* thrown to the winds as humbug and nonsense, and should therefore, for the

honour and consistency of the Society, be erased from its pages. We noticed a tilting waggon of Mr. Milford's with many meritorious points about it that are a credit to the maker. It is moderate in price.

We noticed a capital contrivance for screening gravel, ashes, &c., invented and manufactured by Mr. Alexander Kennedy Smith, of Exeter. This machine is used for preparing all sorts of manure for drilling by screening them free from coarse lumps, stones, straws, pieces of wood, &c. This machine consists of an open-wire cylinder. By turning the handle rotary motion is given to the cylinder; by aid of the mitre-wheel and pinion the material to be screened revolves partially with the cylinder, until it attains a given point in the circumference, whence it rolls by its gravity over the wires until it reaches the bottom of the cylinder. The continuous rise and fall of the material over the rods of the cylinder, during its passage from the mouth to the outlet, effectually and with astonishing rapidity separates the larger from the smaller parts, which are carried out by their gravity, the bottom of the cylinder forming an inclined plane, assisted by the centrifugal force generated by the rotary motion of the cylinder, to the iron shute, from whence they roll into a heap, to be removed as they accumulate; the small at the same time falls under the machine, whence it is easily removed, the stays being circular for that purpose. The advantages of this machine are—its having rotary motion, constantly changing the position of the material; the cylinder being wider at one end, so that the earth, sand, &c., is carried out at the other by centrifugal force; its having the cylinder at an angle to the horizon, facilitating the escape of the material that will not pass the wires; the expeditious and excellent manner in which it performs the work; its effectual screening, when turned by a boy only, as fast as two men can fill into and remove from it; being of lasting material, all malleable and cast-iron, except the bearings of brass and the hard wood ferrule-handle; carefully put together and painted; not liable to get out of order; and if managed with care, lasting many years.

On the stand of Messrs. E. Hill and Co., of Brierley Hill, Dudley, our attention was called to a set of improved cast-iron stable furniture, invented and manufactured by the exhibitors. These fittings consist of a stall-post, with top and bottom rail, grooved for the reception of 1½in. boards for the division of stalls, and enamelled manger with wrought-iron rack attached. This rack is placed on a level with the manger, instead of being above it, as usual, which is considered a great improvement; and the manger may be enamelled or not. These were commended by the judges.

These gentlemen also exhibited a great variety of their iron hurdles, fencing, and gates, article 51 being commended by the judges. They showed a horse hoe possessing the most simple and complete means of expansion and contraction to meet inequalities in the width of drill we ever saw. This hoe was commended. We fear Mr. Hill did not take pains to have a man who could manage this implement as it ought to have been, or he would have got nearer taking the prize.

They also exhibited several weighing machines of merit. One of them received the commendations of the judges. This is a most useful machine, will weigh three cwt. This machine is constructed with moveable pen for weighing sheep, &c.; and for truth and delicacy of action, non-liability to derangement, and the small space occupied, will be found to surpass any other yet invented. Price £4 15s.

These gentlemen also exhibited their iron corn stack and rick stands, of excellent make and moderate in price. They also exhibited a very useful broadshare or skimmer.

Mr. William N. Nicholson, of Newark, exhibited a great variety of grates and stoves, registered and cooking, of all grades, sizes, and prices—from that to suit a prince to the humble, yet comfortable cottage range. He also again carried off the prize of £3 for the oilcake breaker for thin cake.

Messrs. Turner and Co., of St. Peter's Foundry, Ipswich, Suffolk, exhibited their invention of the roller mill, they being the firm that originally invented and introduced this mill for agricultural purposes. It has a novel and convenient arrangement for grinding or splitting beans, that can be either used separately or simultaneously with the crushing portion of the mill. The feeding of this mill is now very perfect, and the whole is not liable to get out of repair. It can be worked by either hand, horse, steam, or any other power. This machine took the prize of £5 as the best linseed and corn-crusher.

These gentlemen exhibited a great variety of sizes of these mills, all beautifully made, and sound in principle.

Messrs. Tuxford and Sons, of Boston, Lincolnshire, as usual, exhibited steam engines, which have long been known for their simplicity, strength, and durability. These engines have a vertical fixed cylinder, and the whole of the engine is enclosed in an iron house at the end of the boiler, which completely protects the working parts from grit and dirt when at work, and from the influence of the weather; therefore there is little or no liability to rust. The whole can be locked up safely when done working. One of these engines having been tried was commended by the judges.

They also exhibited an improved fixed steam engine made of first-rate materials, and beautiful in the combination of its parts and the workmanship. This engine was with great justice highly commended by the judges. These engines are moderate in price.

They also exhibited their combined thrashing, shaking, and winnowing machine, invented, improved, and manufactured by the exhibitors; for six-horse steam-power. Having only eight running bearings, all of which may be oiled on the outside, the machine when running requires but low driving power, works at the minimum of wear and tear, and with a perfectly steady motion; does its work effectually without splitting the grain, and, from its very simple arrangement, is but little liable to disorder. Price, without elevators, delivered at Boston Railway station, £73. This machine was commended by the judges.

They also showed a portable straw shaker, invented, improved, and manufactured by the exhibitors. This shaker has but a single pair of cranks, requiring a very small expenditure of driving power, and, having a continuous table, has none of the tearing action by which other shakers pass down so much short stuff with the grain. It thus greatly economizes labour and time in riddling, &c., sending down the stuff ready for the dressing machine. It is also easily kept in repair. Price, on travelling wheels and with shafts, £16.

They also exhibited a capital large strong saw table, suitable for cutting timber on estates, and for building purposes. It is provided with a parallel fence plate, and turned rollers at the ends, for easing heavy timber on the table. When used for long timber it is furnished with iron rails and horses fitted with dogs, the wheels of the horses being turned up to guide the timber straight. Price of the table, fitted with thirty-inch saw, £20; rails and horses, £15 extra.

They likewise exhibited a strong, simple, and durable kibbling and grinding mill, made of the best materials, with a pair of three-feet peak stoves, complete at £42.

Mr. Williams, of Bedford, exhibited several sets of his well-known harrows, of various weights, to suit all

soils and circumstances. He, as usual, received the prize of £5 for the best set of heavy harrows, and was commended by the judges for his light harrows.

He also showed his ploughs of different sizes and weights, which, if they do not win always, run a very close race for the prize; sometimes winning when the land is hard and difficult.

He also showed his celebrated draining pipe and perforated or hollow brick machine. This machine is, perhaps, more extensively used than any other, owing to its simplicity, efficacy, durability, and moderate price—£13 13s.

He also showed a number of Cornes's chaff-cutters, excellently well made.

He is the manufacturer and exhibitor of Mr. Nicholl's universal horse-hoe, of which we have already taken notice in the trial field, where it worked well.

Mr. James Wood, of Stowmarket, Suffolk, exhibited his portable asphalte cauldron, invented and manufactured by the exhibitor. This forms a complete apparatus for laying asphalte flooring, which may be executed by common labourers at a very trifling cost, according to thickness, varying from 6d. to 1s. per square yard, including every expense. Noblemen and estate owners are respectfully requested to notice this article, as the following are but a few of the purposes to which asphalte has been applied so usefully and cheaply, viz., barn, thrashing, and stable floors; bullock sheds, piggeries, root houses, cottages, paths, yards, malt houses; and washing clay walls, asphalte being impervious to wet, and vermin will not touch it. By an extra thickness being laid, it will also form a permanent railroad to and from manure yards or liquid tanks. Very complete arrangements are made for drying the sand, preventing great loss of time where dry sand is not easily obtained. Printed directions for using are sent with every cauldron, and satisfactory references will be given of their efficiency. Price, complete, with all working tools, £17 10s. This apparatus was commended by the judges. We are of opinion that no gentleman's estate should be without one of them.

He also exhibited several of his scarifiers or cultivators. These implements are of excellent construction, and efficient, while they are low priced.

His combined horse-hoe, double-tom, and moulding plough, we recommend to the notice of all green-crop farmers.

He showed a one-horse cart of considerable merit—strong, simple, and easy to repair in case of accidental breakage of any of its parts. It had an excellent tipping latch, and catch, presenting no impediment or danger to man or horse when in or out of use.

We were pleased with Hall's patent mangle, invented by Charles Hall, of Finborough, and improved and manufactured by the exhibitor. This mangle consists of three rollers of large size, acting by propelling power, not by attrition only; so that linen is drawn in of itself, and pressed on both sides, and carried through the process of mangling various thicknesses, doing its work quite equal to the large patent mangles. The working parts are protected from dust and dirt, giving it the appearance of a piece of neat furniture, requiring but little space, occupying only 3 feet by 2. Can be used in a kitchen or laundry, and worked by a girl fourteen or sixteen years of age. There are no springs to get out of order, as the pressure is produced by bricks, stones, or sand, placed in a box suspended from the gudgeons of the rollers, which are turned up, and work in bored brasses. It is particularly adapted for housekeepers and farmers generally. The inventor has been testing its utility, durability, and full efficiency for the last seven years, preparatory to bringing it before the public. It has recently been secured by patent. Price £6 10s.

Mr. John Cale, of Gloucester, exhibited a variety of slate chimney-pieces, enamelled and plain, very neat; also slate cisterns, from three hundred to eighty gallons. But the most interesting and important was a number of slate milk-coolers, of various sizes, with plug-hole in the bottom for drawing off the skim milk, and leaving the cream unbroken in the cooler. These ought to have had a medal, as there cannot be a better material used, nor plan for the purpose. One of these coolers, complete, five feet long, two feet three inches wide, and five to six inches deep, price 40s. They are worthy the attention of all dairy farmers.

We were again attracted by the great variety and usefulness of Mr. Cogan's (Leicester-square, London) glass dairy and household utensils, which ensure cleanliness with little labour.

Glass churn, now extensively used in small dairies.

Glass milk coolers or pans, of capital shape, and low in price.

Glass cream pots, invaluable, proof against the cream becoming rancid.

Lord Camoy's syphon, for separating milk from cream without trouble or waste. The cream is not disturbed, consequently does not get detrited or mixed with any portion of the milk; the whole of the milk is gradually drawn away in a continuous stream, leaving the cream at the bottom of the vessel unbroken. Price 1s. 6d. each, with stand. This is an excellent utensil, which ought to be in every dairy, however small. The price is inconsiderable.

Cogan's lactometers should be in the hands of every consumer of milk, that they may test the honesty of their milkman. These instruments are only one shilling each. Who would not have one, who buys blue milk?

Cogan's invaluable milk tests—invented, improved, and manufactured by the exhibitor—are entirely of glass (except the quicksilver for loading); entirely free from lead, steel, or corrosive material; have only to be placed in the milk, which, if genuine and of good quality, will leave the bottom line observable; if adulterated and weakened with water, the extent will be shown by the scale. Price 1s. each.

Mr. Cogan also exhibited glass, butter prints, thermometers, glass slates and tiles, glass milk measures, glass rolling pins for making pastry, &c.—in fact, all sorts of little utensils of glass, which, for cheapness, are hardly outdone by delf, and more cleanly, with the advantage the filth is more easily detected. We think many of these things of importance.

Messrs. Holmes and Son, of Norwich, exhibited portable steam engines, compound thrashing machines, and corn dressing machines, all well made, and of good materials.

They also showed a number of drills and manure distributors. The latter were highly commended as useful and efficient machines.

Messrs. Marychurch, of Haverfordwest, Pembrokeshire, had their small occupation drill highly commended—a mark it well merited, for it is one of the most compact, simple, durable, and easily managed of its class of machines. This corn drill is fitted with nine coulters, and combines all the improvements of the most expensive drills. The wheels are 4 feet 8 inches high, each of which is fitted with two nave wheels of different diameters. The coulter bars are made entirely of iron, and fitted with cast iron sockets to vary the distance between them, instead of wooden wedges, which are constantly getting out of repair. A hollow

iron bar supplies the place of the wooden roller which supports the coulters, and serves as a conveyance and protection to the lever rod connecting the motion to the other side of the drill. The corn box is fitted with iron ends, to which an improved apparatus is fixed for the purpose of applying the various sized wheels, which drill any quantity, from two to twelve pecks of corn, or from one to six pounds of small seed, per acre. Price £15.

These gentlemen also exhibited Gardner and Philips's turnip cutters, well made. They also showed some excellent chaff cutters, swing and wheel ploughs, harrows, and a variety of hand tools, all good and reasonable in price.

Messrs. Richmond and Chandler exhibited all their sizes and varieties of chaff cutters. These are machines that stand an unusual amount of tear and wear, and take within a small per-centage of the power of any other, while they make an excellent sample of chaff. There are no machines better made and finished than these, the accuracy of their various fittings insuring great durability, while the prices are very low.

They exhibited a large number of seed and corn crushers, of most useful descriptions—efficient, simple, durable, and cheap.

Their improved steam apparatus, invented, improved, and manufactured by the exhibiters. This farmers' economic steaming apparatus consists of a 30 gallon boiler, and one 4 bushel wrought iron pan (on brackets, fitted with improved iron cover, made steam-tight), for steaming all kinds of roots, hay, corn, chaff, &c. The boiler and appurtenances being complete in themselves, the whole is easy of management and access at any time. Price £6 9s. This is an excellent apparatus, extensively used and approved of.

Messrs. Thomas Gibbs and Co., Corner of Halfmoon-street, Piccadilly, London, as usual, exhibited a great variety of the seeds of agriculture; also, specimens of many of the grasses in full development of plant; also bulbous roots of great size and symmetry of form.

Mr. George Gibbs, of Dover-street, Piccadilly, London, also exhibited a large assortment of all the seeds of agriculture; samples of mixtures of the best grasses for laying land for permanent pasture or meadow; likewise a collection of dried specimens of grasses; wheat, barley, and oats in ear; and a numerous collection of all sorts of bulbous roots.

Mr. James Tree and Co., Charlotte-street, Blackfriars-road, London, exhibited a cattle gauge, and key to the weighing machine, invented by John Ewart, of Newcastle-upon-Tyne, and manufactured by the exhibiters. An improved cattle gauge, on the principle of the slide rule, for ascertaining the carcase weight of fat cattle, adapted in its use for the various breeds of both sexes, and for different states of condition. Made in box wood; box wood, with ivory slides; all ivory; ivory, with electrum slides. The same instrument giving synoptic results in scores of 20lbs., Edinburgh weight; in Dutch stones of 16lbs., of 17½ oz. avoirdupois; imperial stones of 14lbs. avoirdupois; and in London Smithfield meat stones of 8lbs. avoirdupois, by the same, and made of the same materials. Price, from 4s. 6d. to 16s. 6d. each. The above cattle gauge arranged in a circle, on the case of a measuring tape, 30 feet long, made in brass, with electrum slide, gauge points engraved, with book of instructions for its use. Price £1 5s. We have used these gauges, and found that they rendered great assistance in arriving at the weight of animals, &c.

Mr. George Chivas, Chester, exhibited many beautiful specimens of his orange jelly turnip. This turnip is particularly adapted for late sowing, and will do sown in August. They are hardy, and highly nutritious; they are also quick growers. Every farmer ought to give them a trial for late sowing—the quality is excellent. Price 2s. per lb.

Messrs. Gibson and Son, of Newcastle, exhibited their well-known and justly appreciated roller, being a very useful implement for all the purposes of a heavy roller. It does not clog in damp weather. It leaves no small clods. It does not cut the weeds, which may easily be raked off afterwards. It gives to light land the degree of solidity required. It fastens the young wheat after frost, and admirably prepares the ground for grass and clover seeds. It will be found invaluable for flax seeds. Price, for No. 2, £15. This implement was commended by the judges: a mark of merit it well deserved. They also showed their drill for sowing root crops on the ridge. This is a simple and efficient little machine, made well, upon good principles, accommodating itself to the irregular width of the ridges, and always sowing the seed in the middle of the ridge, which is of great importance.

Both in the field and the yard it was evident that the tools, implements, machines, and engines were all of a more practical description; indeed, there were none of those nondescript things that used formerly to decorate the show-yard—more for ornament than use. However, we are abundantly pleased to find that the Royal Agricultural Society have not only weeded out those foolish complications of our national genius, but have given that genius direction into the right path, which has been highly successful, as is completely proved and set forth by the excellency of this year's show, both in the utility and the construction of the various articles exhibited; in fact, the workmanship, material, mechanical genius, and artistic task displayed in combining the principles of the various articles, speak louder than words that all parties are now getting to understand what the requirements of the farmer are. We must say, that it is our decided opinion that except mechanics put good and neat workmanship into the articles made by them, we have great doubts about the amount of care that will be bestowed upon the more vital parts of the case; we are therefore the better pleased at seeing the various implements, machines, and engines generally finished up in true workmanlike style; indeed, we know that when the judges found shaky points in anything, it was with those parties who have not arrived at that advancing pitch of excellence that almost pervaded the whole yard.

EXHIBITION OF IMPLEMENTS AT THE YORKSHIRE AGRICULTURAL SOCIETY.

At the Yorkshire Agricultural Show held at York on the 4th and 5th of August, we were highly gratified by the great improvement observable in almost every implement and machine since we met the exhibitors at Sheffield last year; indeed, great credit is due to the agricultural mechanics for the unceasing energy, ingenuity, and perseverance they have and are displaying in the arduous undertaking of bringing all those implements and machines employed by the farmer into the most simple and efficient form, to combat the various difficulties arising from soil and climate. We cannot but express our extreme satisfaction at the way this society keeps, at least, pace with the Royal Agricultural Society of England; indeed, it would appear that the whole kingdom is not an overwhelming match for Yorkshire in the spirit for agricultural improvement in all its branches.

We attended the trial of combined thrashing-machines, and closely observed the results; and were rather surprised that the elements taken into consideration were incomplete, inasmuch as they were not sufficient to give the result desired, because the machine that took least power to drive it recorded against itself. Thus, a counter is placed upon the steam-engine that is to drive the thrashing machine under trial. The said engine has been tested, and the amount of pressure of steam that is equal to the various numbers of horse-power these thrashing machines require, or, rather, are supposed to require. The maker of the thrashing machine is asked how many horse-power his machine requires, and the engine has the steam kept at the required pressure in the boiler. Now all ready, a start takes place, and the engine has just power enough to keep up the speed of the machine; therefore the mechanical and the real time occupied in performing the work will be at par. But if the engine cannot keep up the speed of the thrashing machine, the mechanical will be less than the real time, therefore record in favour of the bad machine, because real time was not an element of consideration. Again, when the owner of a machine made his six-horse machine much easier driven than another's five horse-power, the engine will run away that is having its speed nearly doubled: therefore the mechanical will be nearly double that of the real time. Thus the best machine, as far as the economy of power is concerned, would be represented as the worst, which we know is not what the judges are looking for. Another thing, if a machine is overdriven it is liable to break grain and straw, thus again telling against the machine in two important elements. Also, from overdriving, the blower is liable, in fact almost sure, to blow some of the grain amongst the chaff—another great evil. Indeed, from what we heard of the trial at Gloucester, and what we witnessed at York, we do not place much faith in the trials as a guide for purchasers to the best machine.

We will lay before our readers the results of our observations. First, Mr. Hart's Gloucester prize machine was tried with five-horse power, the proper speed of the engine being 116 revolutions per minute. It took 687 revolutions of the engine, being 5.92 minutes of mechanical time, while it was 6.85 minutes of real time; so that by real time it would take 34.25 horse-power, and by mechanical time only 29.60 horse-power to do the whole in one minute.

The next machine tried was Hornsby's, which was six horse-power. It took 781 revolutions, equal to 6.73 minutes mechanical time, so that it would require 40.38 horse-power to do the whole in one minute mechanical time, while the real time was 5.87 minutes; thus requiring only 35.22 horse-power to do the work in one minute.

Next came Tuxford's six horse-power, which performed its work with 511 revolutions, or equal to 4.40 minutes of mechanical time, the real time being 4.35 minutes; so that by real time 26.10 horse-power, and by mechanical time 26.40 horse-power would be required to do its work in one minute.

The next machine tried was Messrs. Clayton and Shuttleworth's, which was so badly managed that we do not think it would be altogether fair to give a report of its performance under these circumstances, although we know that any report could have but little effect upon their far-famed machines.

We think that it will be sufficiently evident to all parties that neither the mechanical time nor the real time separately can be sound data to adjudicate upon the economy of power required by any sort of machine.

In these trials, the work done by all three machines was good in every way, except that Mr. Hornsby's did not separate the chaff from the chavings or short straws; whereas both Hart's and Tuxford's did so. Hart's had a very neat and simple mode of elevating and putting the clean grain into the sack or other article used for taking away the corn to the granary. We have serious doubts of the wearing out of this machine, from the great shaking it is put through, from its height, which is also a great inconvenience when the stack gets low.

We had also objections to the plan of blowing the chaff out at one side of the machine, rendering it difficult to preserve it from being mixed with straw and blown about by the wind, thus either losing the chaff or frustrating the object desired.

The trial of steam engines was a very animated one. As that at Gloucester was scarcely satisfactory to two parties, Hornsby's engine having an accident, so at York was to come off the grand tug of war, the result of which was that Messrs. Clayton and Shuttleworth's engine took three-halfpence-worth of coals per day less than Hornsby's; and the latter being less in price, induced the judges to divide the prize between these two ardent competitors for the palm of merit.

The Trial of Reaping Machines

took place on a piece of self-sown oats, on Mr. Ireland's farm, at Earswick, about four miles from York. The land was very rough, owing to the circumstance of its being ploughed across after a crop of oats, with the intention of preparing the land for a crop of wheat, when the oats came up so thick as to induce Mr. Ireland to let them stand for a crop; so the land had not been either harrowed or rolled—therefore the surface was very uneven. The land was also in rather high ridges; but the furrows were erased by the cross-ploughing. The crop of oats was very light, which was greatly to the advantage of those machines requiring manual labour to take the cut crop off.

About twelve o'clock, Mr. Crosskill's man started, by the instructions of the judges, to cut a head land all round the field, which was done capitally, laying the cut crop in a well-arranged swathe up against the fence. It went twice round, leaving a beautiful head land, twelve

feet wide. After the swathe that was in the way was gathered up, and laid upon the other against the fence, the judges arrived, and began their duties by arranging the rotation of starting, when it fell to the lot of Mr. Palmer, of Stockton—Mr. Garrett's agent—to start first. This machine did its work in its usual style—in fact, we never saw a better man on this machine. The cutting and laying it down were very good; but the horses were rather severely drawn.

The next tried was Bell's, manufactured by Crosskill. This machine is propelled by horses walking behind, and cuts the crops equally as well as any of the others; and its self-delivery was such as to call forth the praise and admiration of all lookers-on. It lays the cut grain down in a better-formed swathe than ever we have seen the best cradle-scythe man lay down. This machine is rather heavy work for the horses; but they have not to walk fast—in fact, it does not seem at all to affect the working of the machine, whether the horses go fast or slow. We noticed that, where the crop was the largest, it laid the swathe the best.

The next machine tried was Mr. Crosskill's Hussian reaper of last year, with an improved cutter, that will not choke amongst grass, neither is it affected by wet, as was the case last year. The horses may go as slow as it is thought fit, and when the machine is stopped it can start off again without drawing back. There is a wheel fixed in front to guide the machine across furrows while it carries the pole. The platform is also shortened, which gives great relief to the man putting it off. The man in this case did not deliver so well as we have seen done, but the machine cut decidedly the best in the field, and was easy work on the horses.

The next was Messrs. Burgess and Key's McCormick's American reaper, so well known to the public. It is greatly improved since last year, and is intended to act both as a reaper and a mower of hay.

We were greatly pleased to see the extremely good feeling that existed among the exhibiters, as exemplified by Mr. Crosskill lending his horses to Messrs. Burgess and Key to work their machine, which greatly facilitated the trials. This machine did not perform so satisfactorily as we have seen it, owing to an attempt made to cut lower than the unevenness of the ground would permit; therefore the machine scraped up the soil whenever the diving-wheel got into a hollow part—thus stopping its performance several times. The delivery was not so satisfactory; which we think was partly owing to the man being obliged frequently to jump off his stand to lighten the machine when it began to scrape the soil. We observed that this machine has the speed of its cutter greatly increased since last year, which has made it rather severe work for the horses.

Next came Mr. O. Hussey, with his improved machine; which, after starting, was found to be imperfectly made in some part of its details. Therefore it would be unfair to report of its performance. He afterwards tried his one horse reaper, which worked nicely; but it was over-severe drawing for one horse.

The next tried was Mr. Wray's, of Leeming, near Bedale. This machine is made with the intention of a self-acting delivery, but proved a complete failure. Yet we think there was a deal of ingenuity displayed in it, and have good hopes of the inventer yet making something of it.

The judges ordered Mr. Crosskill's man to charge right into the crop and go through to the other end; which he did without ceremony, leaving a beautifully clean cut lane 6 ft. 4 in. wide, cut with the swarth laid up against the standing crop on one side. He then worked backwards and forwards, cutting and laying the crop to the satisfaction of every labourer, old and young, as well as farmer, in the field, all admitting they had found what is wanted. And the judges awarded the prize of £10 and the gold medal; which would not have been awarded unless the judges were perfectly convinced of the utility of the machine.

We were unable to get into the field to see the trial of the field implements, but understood from one of the judges that the trials were not so satisfactory as was desirable, owing to the extreme stiffness of the soil, which made regular havoc of the swingle-trees and harness.

To give a criticism on the implement yard would almost be a repetition of our Gloucester report.

THE ROYAL AGRICULTURAL IMPROVEMENT SOCIETY OF IRELAND.

MEETING AT KILLARNEY.

In no part of the United Kingdom are the uses of an "Agricultural Improvement Society" so directly required as in Ireland. In no quarter is there so great a call for improvement, while in none are the people less inclined to go in search of it. The force of example must be brought home to their own doors. Thus, and thus only, will they gradually come to learn what their country is capable of producing. The lesson for the most part will be read them by the stranger, and under no better auspices could he obtain an introduction than those of an Agricultural Improvement Society.

We have some sanction here for advancing. The days when Paddy sat him down, shutting his eyes and opening his mouth, to wait for what the land would give him, are fast passing away. He must move on, or move off. Order, sobriety, and intelligence are all marshalling themselves against the spirit of old times. Men are beginning to feel they have higher duties than to merely exist and to complain. A reputable living may be made even out of an Irish soil, and those yet loath to achieve it, must have to stand aside for others who will. The whole truth, unpalatable as it may be, is becoming gradually more apparent—if a man cannot do well here, it is surely more or less his own fault; while nothing would seem now to threaten the ultimate prosperity of the country but the prejudices of such as should be most interested in its well-doing.

The first stone is already laid. Those who know Ireland best are the most ready to comfirm the extraordinary improvement observable within the last five years. To the stranger, however, this is scarcely so palpable. The visitor who runs and reads would perhaps, as yet, mark but little signs of advance. Take, for instance, the journey down from Dublin to this meeting at Killarney. The good comes on you in patches only, and these at long intervals. A beautiful country, that to the eye of an Englishman, if not altogether running to waste, is rarely half cultivated, has still here and there a redeeming oasis. It looks as if the national pride were so addressing you:—"We don't care to do anything with the land, but just see what it would do if we chose." Such example seems more for bravado than imitation; and thus a few

acres of excellent turnips, a strong crop of oats, or even a good piece of wheat, are followed by miles of ragged pasture, or as rough and much-neglected arable. What is produced, the land chiefly does for itself. Those twin companions, Capital and Industry, have yet to smile upon the soil. In vain you search for any hint of their presence. Little or no stock in the open, and seldom, indeed, a shed or homestead in which they may be housed. The improver in Ireland will at least have the satisfaction of feeling that he may begin on first principles.

It is questionable whether an agricultural society can as yet do much for a country in this primitive state. The people clearly want further educating up to the object of such an institution; or, at any rate, if its example be not beyond their capacity, it is generally far above their practice. Directly, the small cottier tenant can have profited but in a very limited degree from the proceedings of the Irish Agricultural Society. His want of means, no doubt, has been the great impediment; his want of sympathy in what was being attempted must, to a certain extent, have been also against him. What, however, he cannot or will not do for himself, may be done for him. It is with the Landowners, or others altogether in a superior position, that the beneficial influence of this society so far rests. It is through them that the spirit of improvement must be brought home to the doors of the tenantry—as it is step for step with this spirit of improvement that the latter will have to advance—or retire.

The Agricultural Improvement Society of Ireland has flourished, so far, chiefly from that kind of support to which we have alluded. It is the gentlemen, both Irish and English, that, for the most part, enter into competition for the prizes offered. It is of the proprietors, more generally that the Council is composed; and it is, we believe, from the same classes that the income of the society is mainly derived. It would not be to our purpose here to dwell on the way in which the management is conducted. The best intentions are often thwarted, from some little lack of judgment; while it is but a national characteristic, after all, to find a plan resolved on, with but very little consideration as to how it is to be carried out.

On some such hasty conclusion must Killarney have been selected for the show of this year. One great point, of course, in any public meeting, is to secure a good attendance. Killarney held out every promise of this. There was a double inducement for the visit—an attraction, too, just at the right season; and many a man who could not afford to start solely for the Lakes, or merely for the cattle-show, combined the two, and made up his mind for the trip. The Council of the society had naturally reckoned on this, and they prepared accordingly. Some three or four weeks previous, rumours reached us, even in London, of hundreds of beds being engaged at a certain fixed price per night, and everything arranged with equal forethought. Killarney, to be sure, we were told, was not a large town; but then there was an immense hotel close adjoining it; while a railway, almost into the street, would frequently relieve the place of any surplus population. This was the word of promise—then came the reality.

There *may* be some smaller, poorer, and, generally less convenient towns or villages in Ireland than Killarney. There *may* be when at the height of its season, some place really less adapted to entertain a large meeting of visitors who wish to stay the best part of a week within its precincts. The Council of the society *might* have fixed on a spot calculated to offer less accommodation to the supporters of their show; but we beg leave to doubt whether, under all the circumstances, a worse selection could have been made. If the society was at all doubtful as to its own powers of attraction, it might have made Killarney an ally. The Lakes might have been to Cork, or Limerick, or some other city of character, what the sea at Brighton was last year to the English show at Lewes. An attendance would have been almost as certainly insured, while the visitors might have enjoyed both "the sights" with something like pleasure and comfort.

At Killarney we fear there were few indeed so agreeably circumstanced. It has been our lot to "rough it" at many crowded meetings of different descriptions, but we never remember anything like those few days at Killarney. A glimpse of the town itself naturally enough sent every fresh arrival off at once for the Victoria or Lake Hotel—some two miles out; this was full of course, and back came the stranger in search of his bed. The five-shilling limit as to price, never sounding very practicable, quickly broke down, and you were gravely asked half-a-guinea a night to sleep in the same bed with a gentleman whose acquaintance you were to make on the occasion! And such beds, and such rooms! The town of Killarney is favoured in a very eminent degree with that odour peculiar to many of the small towns in Ireland—a composition of bad whiskey, peat-burning, and want of drainage. It meets you at every turn and in every corner. Bedrooms with impracticable windows especially welcome it; and as the worn-out Londoner—happy at last in the share of a closet and the whole of a bed—rests his weary head, he feels this change to the pure air of the country, a change indeed!

Even this was not all. Secure at last in a resting-place of some kind, he flies again the town for "The Victoria" or the Lakes. If there is no bed here, there is at least a dinner; and he is entering a well laid-out, half-filled coffee-room—a brawny waiter interferes:

"Ar ye a railway gentleman?"

"No, thank heaven!"

"Then ye carnt come here."

There is a *third* attraction. The "railway gentleman" has taken this convenient opportunity for laying the first stone of the Lake Junction Railway; and, with admirable provision, has *engaged the whole of the hotel for himself and his friends.*

"Ar ye a railway gentleman?" "Ar ye a director?" "Ar ye a railway lady?" If ye are not, you will find it difficult to get anything here. We give the railway people every credit for this most selfish bit of monopoly; and we may add that they appear to have done everything more in their power to confirm the inconvenience of their

customers. Fancy, in such a week, there being no train to Dublin after half-past ten in the morning, and being advised at the station to secure a seat on the car, which took you some forty miles to catch the Cork mail! A car that held six or eight people, and that, of course, amply satisfied the wants of those whom the cattle-show, the railway ceremony, and the famous Lakes had seduced to the place!

We have thought it right to dwell thus at length on the something more than mistake made at Killarney. We can assure the Council of the Agricultural Society that much of their success must depend on such a one never happening again. With the facility of communication now existing between the two countries, the character of the Irish show cannot but be in every way heightened by the presence of the English agriculturists. They have already evinced their willingness to give all the aid in their power. The catalogue and prize-list of this Killarney meeting will tell what they did for it. It should be the object of all of us to encourage such mutual intercommunication; but this will never be done without some better management than that we have just witnessed. We went over in company with a distinguished breeder, whose beasts added much to the repute of some classes. He shared with us many of the miseries we have touched on, and, like many others, appeared to have but one aim, after he got into the place, and that was—to get out of it.

The show-yard was opened on Wednesday at half-a-crown the entrance, on Thursday at a shilling, and on Friday at sixpence. The first day's attendance was very fair; the second, considering the reduction in the charge, anything but that we expected. We left the yard, however, between two and three, soon after which time, we are told, the numbers were much increased by the arrival of a long train from Cork. The company, which included the Lord-Lieutenant, was remarkable for the almost entire absence of the small farmers and peasantry. Like the Welsh at Gloucester, the object, so far as they were concerned, looked like a failure. Still, Friday at sixpence each, promised better for them: on Friday, we were assured, they would come—but on Thursday night, the stock left the yard!

We confess that we had not time to inquire very minutely into this arrangement; but there is something rather Irish in the notion of keeping an exhibition open with nothing to see in it. Perhaps, though, the flax and cheese were left for the peasantry, as their more peculiar care; but it was a bad compliment, any how.

The show itself was excellent—superior, in fact, in many classes of the animals to what the most sanguine might have expected. Although increased by entries from England and Scotland, the country was very handsomely represented. In Shorthorns, Devons, Kerry cows, sheep, and pigs there must be ample foundation for good stock. Here, of course, is the most direct road of the society to agricultural improvement; and here it is that the members of it will receive so much assistance from the English and Scotch breeders. We hope in future years to see the names of Mr. Towneley, Mr. Douglas, and Mr. Lister Maw, increased by many others—distinguished not only as shorthorn breeders, but of other kinds of stock, perhaps, as yet, more celebrated on this side of the channel. At present the Shorthorn is the rage in Ireland; and from what we could gather, the breed is gradually becoming more sought after. It is kept, too, by many of the country gentlemen, with the strictest regard to purity of descent and pedigree. This was very noticeable in the animals exhibited, nearly all showing the highest character of the sort. Indeed, taking the whole average of bulls, cows, and heifers, it was perhaps the very strongest show of shorthorns of the year. We must refer to the prize-list—at page 231 of the present number—to show how the home breeders shared their honours with other gentlemen from more distant parts. In the cows and heifers, as usual, Mr. Towneley stood pre-eminent; though again, as is his custom, with his stock, a little too much "made up" for a breeding show.

The other classes included some very neat Devon and Highland cattle; while the Kerry cow reached a high sample of this serviceable little animal.

The sheep, though not a great entry, still added to the strength of the meeting—the Leicesters and long-wools generally having the call; while in the pigs, remarkable both for their number and general excellence, the Berkshire appeared to be the favourite cross. They are reared here, as it is said, quite pure, to a very great size.

The implement department was numerically the weakest part of the yard; and owing to some mismanagement, we heard some of the more important trials were not proceeded with. Many of our English makers were, however, represented here; their several stalls, of course, displaying those prize inventions or improvements which have so lately and so fully been descanted on in the *Mark Lane Express*, when brought into competition at our own meetings. Amongst others, whose names we found at Killarney, were—Ransome, of Ipswich; Stanley, of Peterborough; Barrett, Exall, and Andrews, of Reading; the Howards, of Bedford; Garrett, of Saxmundham; Smith, of Witham; Richmond and Chandler, of Salford; Hill, of Brierley; Young, of Edinburgh; Bigg, with his sheep-dipping apparatus; and some, though not many, Irish firms.

A poultry department—to judge by similar exhibitions—of no great excellence; half-a-dozen premiums for prepared flax; and a famous show of cheese and butter completed the attractions of the Royal Irish Agricultural Improvement Society—an institution, we must repeat, that has all the elements of success, and that year by year must enjoy a finer field for its labours and a better opportunity for the attainment of its objects. It is not Ireland alone that will watch or speed its progress. Let not, then, all these fair premises be endangered for want of a little forethought and management. The Lord of Misrule is, after all, Ireland's greatest difficulty, and we believe we are only serving her when we denounce him.

SAMUELSON'S DIGGING MACHINE.

We promised some weeks ago that when the trials of the new digging machine, invented by Mr. Samuelson, had been sufficient to justify our expressing an opinion of its merits, we would return to the subject; the two trials at Gloucester and at York having now given us some warrant, at least, to speak of that implement with a little more than theoretical knowledge. Between the machines of different manufacturers we never interfere—the public are sufficiently awake to discriminate ere long which of two ploughs, or carts, or scarifiers is best suited for their purpose. But when a new invention presents itself to our view, starting any new principle of cultivation, it is a proper subject of remark and animadversion, and it would be a dereliction of duty if any sense either of delicacy or of fear of offence induced us to pass it by in silence.

There are a great many elements of inquiry opened up by the two trials we have alluded to. The machine itself is quite the reverse of the plough. The latter is a *pressing*—the former a *lifting* operation; the one consolidates the subsoil—the other fractures it; the one plasters like a mason's trowel—the other lightens like a fork. The one is the operation of a WEDGE—the other of a LEVER! Hence the result is not only different, but, we may say, opposite on the soil.

The Gloucester trial was made in a soil perhaps too wet from the weather to give it a fair chance. To be fair and equal, especially in a new implement, where it may be supposed all the guards against contingencies are not fully provided, it is clearly important to have the medium on which it is supposed to operate in a state fit for its beneficial operation. In other words, the land must be in that state that an agriculturist would wish it to be in if he were about to sow it with the crop for which it was intended. The perpendicular motion, too, is one where a wet soil would be found to operate decidedly in an adverse manner; and hence the natural difficulties of the Gloucester trial were decidedly against the implement. And then it took seven horses, and for them it was hard work; and possibly it would, if worked for a whole day, have required relays, and might, according to appearance, have clogged before night. These are the unfavourable aspects under which it was presented. But when it is remembered that it loosened thoroughly a width of three feet; that it then took a space before it of nearly four ploughs, which would have required eight horses instead of seven; that the land had not been loosened in a similar manner before, the difficulty almost disappears, and it seems vastly more on a par with the plough than we could at first have imagined.

The York trial was in fine weather, but it had been preceded by almost unremitting rainy days for some period previously. The land was one of those strong untractable clays for which the valleys of Yorkshire are many of them so celebrated. The horses were certainly below par; but so thoroughly did the machine loosen the soil, pulverize the clods, and leave the surface, that three eminent practical judges awarded it a prize of five guineas.

Let it not, however, be thought we say that this machine has exactly answered all its professions. We say not whether this individual implement is calculated for general use or not; but we do say, most unhesitatingly, that the *principle of a digging or forking machine—which this is more particularly—is fully established.* We leave it for others to work out that principle, and to adapt details to the circumstances of each case of soil and crop; but it appears to us that the circular motion is calculated to break up, to pulverize, and especially to leave the root-weeds near the surface in a satisfactory manner. And what of the draught, after all? Diminish the surface covered, and fewer horses will answer; only it must be borne in mind that the wider the area the greater the probability there is of all being covered, and if seven or eight horses will take a three-feet wide implement, a pair will be master of one with a cover of one foot.

We have seen five letters from as many practical men in different parts of the country, all written about the same time, which quite agree in speaking favourably of its operation from day to day on their farms. We, however, do not wish this to be taken for more than it is worth, namely, that there are other trials, which, to say the least, proffer to act well, and to confirm the two more public experiments at Gloucester and at York.

We mentioned in a previous article that the idea was embodied before. In 1842 a "spade plough" was exhibited at York by Lady Vavasour, which was, in fact, a roller studded with a complete armour of round-pointed knives, which described so many tangents from the centre motion. We never saw it in operation, but could venture to predict, with all the certainty imaginable, that it would clog either in tenacious or foul land of almost any description. The digger of 1853 has great advantages over this, because it has a clearing apparatus, the tines are far more distant and better disposed, and thus many of the tendencies to clog are clearly remedied.

We hope the *idea* will be carried out, and great practical results will follow. The plough has been in operation for at least four times ten centuries, and with very little real alteration, so far, at least, as regards its plastering and consolidating of the subsoil; but let other powers of stirring, mixing and pulverising be brought into operation, and a more open subsoil, a deeper soil, and, as a consequence, more yielding and productive crops will be the result.

It only needs to be established, in this country, that the principle is practical, to secure those who will carry out and improve upon it. The reaping machine is a proof of this, in a most satisfactory degree; and, as we incline to the forking principle being fully established, we hope to see the details soon mechanically adopted with success, for the benefit of agriculture.

METROPOLITAN POULTRY SHOW.

The Summer Exhibition was held at the Baker-street Bazaar, on Wednesday, July 27, and two following days. The attendance of company, influenced by a combination of circumstances, the most important of which was the cab strike, fell far short of anticipation; and the result of the show, in a pecuniary point of view, must have been anything but satisfactory to its promoters. That good will arise from these gatherings there can be little doubt, for, divested of the excesses which many have indulged in, their real object is utility, and as such will awaken attention amongst farmers and others whose occupation enables them to make a profit from an apparently unimportant part of their profession. We have no doubt careful observation will ultimately determine the question of priority, while a better acquaintance with the management of poultry will give a corresponding improvement in value. Summer is not a season of the year best calculated to show old birds to advantage; and hence, so far as they were concerned, the public could scarcely be disappointed at the ragged and apparently unhealthy condition in which they found this portion of the exhibition. Chickens, on the other hand, uninfluenced by the same causes, lost none of their beauty and attraction, as the very large entries in all the classes proved. Spanish headed the list of classification, and here we were disappointed. Remembering the very high sums which have been given for first-rate specimens, it was natural to presume that a higher degree of interest would have been awakened, and birds of undoubted merit have been much more numerous. There can be no question that if the object is to obtain the greatest number and weight of eggs, the Spanish are entitled to the palm of superiority, while they also form a very useful table fowl. With the exception of the prize and commended birds (the property of Messrs. Hornby, Fox, and Owen), there was scarcely a pen deserving of the slightest attention. On no previous occasion have the Dorkings received the same attention as on the present, and it would almost seem as though the Cochin-China furor had attained its climax, and the Dorking taken its place. In many respects this can be no matter of surprise. Although generally inferior layers, Dorkings are unrivalled in all the good qualifications for the table. It is true the flesh of the game fowl has the admiration of not a few epicures; but for size and quality the Dorking has not its superior, if it has even, and that is doubtful, its rival. The show, evidenced by the number of commendations of the judges, was really good. A cockerel and three pullets, the property of the Rev. T. Boys, were sold for £12 10s., and two commended lots for £10 each. Several others realized equally high rates. Capt. Hornby took the principal prizes for aged birds, yet he had to give place to Mr. Boys in the class for chickens. Aged Cochin-Chinas were greatly deficient in merit, although a commended pen of Mr. T. H. Fox's were taken at the reserved price of £40 The chickens (cock and three pullets) which obtained the first prize, and the property of Mr. Edward Terry, of Aylesbury, were bought in at £55, while the second prize birds were purchased by Mr. Eason, of Lower Norwood, for £60. It may be truly said that the real value of an article is the price it will bring, yet we may be excused in believing that, except for the gratification afforded to many in seeing their names at the head of a prize list, these birds would never have obtained anything like such a sum. It cannot be denied that the Cochin-China birds have claims peculiarly their own, laying extraordinarily well, as chickens hardy, not fond of straying away, and easily confined; but still many will be inclined to think there is an absurdity in such extremely extravagant prices for birds not yet perfectly developed. Some idea may be formed of the extent of the competition when it is stated that in classes 10 and 13, for Cochin China chickens, no less than 136 pens were entered for competition in the former class, and 75 in the latter. Many of these were sent purposely for sale, but sore must have been the disappointment of the exhibitors; for what with extravagant prices on one hand, and indifferent pens on the other, very few indeed were sold. The pen of white Cochin China chickens exhibited by Mrs. Herbert were deservedly admired; a more beautiful lot we never saw, and they found a purchaser at £50. At such a sum they certainly ought to be something more than ordinary, yet a pen of stock birds bred from the same yard failed to receive the attention of the judges. Nothing can be said in praise of the Malays; and although the commendations were tolerably liberal amongst the game fowls, we must certainly regard them, on the whole, as an inferior collection. Neither the golden nor silver-pencilled Hamburghs were more than of average merit; but the golden-spangled old birds were good, the second prize being sold to Mr. Bailey for £10. The chickens of the silver-spangled Hamburghs were described by the judges as "meritorious," and their sale excited considerable competition. The Polands as a whole were good, if not first-class birds. The gold and silver-laced bantams, the premier prizes of which were obtained by Mr. Rawson, of Walton-on-Thames, were beautifully laced, and had not a few admirers, especially amongst the ladies. We noticed nothing calling for particular attention amongst the classes for distinct breeds, unless it were some white Polands of Mr. Potts', Ptarmigan fowl of Dr. Burnley's, white Polands with black top-knots of Mr. Singleton, and Brahma Pootra of Dr. Gwynne. The geese and ducks were equally superior. The show of pigeons was large, and included several very excellent specimens. The judges were:—For poultry—E. Hewitt, Esq., of Eden Cottage, Sparkbrook, William Symonds, Esq., of Rodwell, and Mr. Bailey, of London; for pigeons—Mr. Dean, of Worcestershire, and Mr. J. M. Eaton, of Islington, whose decisions

gave general satisfaction. It only remains for us to add, that the whole arrangements were highly satisfactory, reflecting every credit upon the indefatigable and obliging Secretary, Mr. J. H. Catling; while the expedition and truly business-like manner of Mr. Strafford in the public sale must have its effect in promoting the success of future exhibitions. G. H.

DEPOSITS OF GUANO IN THE INDIAN ARCHIPELAGO.

SIR, —I enclose a collection of extracts from works relating to the Indian Archipelago, which may enable your readers who are acquainted with the chemical properties of Peruvian guano to ascertain whether the material found in the limestone caverns of the Indian Archipelago assimilates to it. The deposits appear to be of immense extent; indeed, those of the East India Company's territories in the neighbourhood of Burmah would alone supply cargoes for many thousand tons of shipping; and the circulation of these extracts will cause inquiries to be made in the Dutch and Spanish possessions of the Archipelago, which, I have no doubt, will be attended with important results, should the material be found to contain great fertilizing properties. Of the works extracted from, those of Forrest, Crawfurd, and Marsden are recognized authorities in that part of the world. The valuable little work of the Rev. F. Mason, which gives the result of 20 years' local experience in the countries bordering on Burmah, is less known; but, as I perceive from the preface that Major Bogle, the East India Company's Commissioner in the Tenasserim provinces, subscribed for 50 copies, the work will probably be found in the library of the India House. The *Journal of the Indian Archipelago* is regularly forwarded to Mr. Richardson, of Cornhill. The narrative from which the extract is taken has been attributed to a gentleman of high literary attainments in the service of Her Majesty's Government; but, as he has not appended his name to the article, I have thought it right to adopt the same reserve. GEORGE WINDSOR EARL.

Hampstead, Aug. 17.

No. 1.

Extract from a *Voyage to New Guinea, &c.*, by Captain Thomas Forrest, H.E.I.C.S. London, 1779. (The part from which the extract is taken describes a visit to a cavern in the island of Mindanao):—

"From the hall I passed, on the same level, into a crooked gallery, in length about 200 yards. It was seven or eight feet broad, and from six to eight or ten high. The sides and top looked like dirty freestone; the floor was perfectly level, and, in most places, miry to the ankles. Around us flew an infinite number of small bats,* from which I defended myself with the lighted torch I carried in my hand. Many of these birds of darkness clung by little hooks at their wings to the sides of the passage. I might have gone further, but declined it. Returning, I saw the entrance into another passage, and felt a very small draught of air, which made the torches burn. This passage, I was told, went a good way, and gave another outlet; but at a distance so great that none of my guides had ever ventured to explore it. As I went in barefooted, I found the miry stuff stick to my feet. Being very glutinous, it was not easily washed off. To make saltpetre they mix one measure of this stuff with two of wood ashes, and then filter it through the water of which the saltpetre is made. The gunpowder they make here is very coarse-grained."

* Combes says, in the caves of Mindanao are bats as large as fowls, and that saltpetre is made of their excrement.—Page 188.

No. 2.

Extract from Marsden's *History of Sumatra*. London, 1814:—

"In the country of Kuttaum, near the head of the Urei river, there are extensive caves, from the soil of which saltpetre is extracted. Mr. Whalfeldt, who was employed as surveyor, visited them in 1773. Into one he advanced 743 feet, when his lights were extinguished by the damp vapour. Into a second he penetrated 600 feet, and after getting through a confined passage, about 3 feet wide and 5 in height, an opening in the rock led to a spacious place, 40 feet high. The same caves were visited by Mr. Christopher Terry and Mr. Charles Miller. They are the habitation of innumerable birds, which are perceived to abound the more the further you proceed. Their nests are formed about the upper parts of the cave, and it is thought to be their dung, simply, that forms the soil (in many places from 4 to 6 feet deep and from 15 to 20 broad) which affords the nitre. A cubic foot of this earth, measuring 7 gallons, produced, on boiling, 7lbs. 14oz. of saltpetre, and a second experiment gave a ninth part more. This I afterwards saw refined to a high degree of purity; but I conceive that its value would not repay the expense of the process."—P. 173.

No. 3.

Extract from Crawfurd's *History of the Indian Archipelago*. Edinburgh, 1820:—

"The process of manufacturing saltpetre and gunpowder will demand a short account. Saltpetere is obtained by boiling the soil of the caves frequented by bats and birds, chiefly swallows. The soil is the decomposed dung of these animals, which commonly fills the bottom of the caves to the depth of from 4 to 6 feet."—Vol. 1. p. 200.

No. 4.

Extract from the Rev. F. Mason's *Natural Productions of Burmah, or Notes on the Fauna, Flora, and Minerals of the Tenasserim Provinces and the Burman Empire*. Maulmain, 1850:—

"CAVE BAT.

"Every one who visits the limestone caves of the Tenasserim coast is startled with their bat-wing music. Suddenly, on entering these subterranean halls, thousands of bats rush from their dark recesses, and wheel over the traveller's head with the deep whizzing sounds of a passing water-spout. And then they hang trembling and rustling their wings in the lofty black galleries above, like a choir of wind harmonies muffled in the mountains. The large quantities of guano accumulated in the caves inhabited by these bats might be turned to a profitable account by our horticulturists."—P. 222.

No. 5.

Extract from a journal kept during a visit to the river Barram, on the north-west coast of Borneo, in the Hon. Company's steamer Pluto. From the *Journal of the Indian Archipelago*. Singapore, 1851. [The paragraph from which

the extract is taken describes a visit to one of the limestone caverns near the banks of the river.] :—

"By the imperfect light we could only distinguish masses of uneven rock on either side. As we advanced towards the spots where the birds' nests are found, the ground became covered, apparently many feet deep, with the guano of the swallow, which emitted scarcely any smell."—Vol. v., p. 687. —The Times.

GUANO FROM NEWLY-DISCOVERED ISLANDS.

SIR,—It may be interesting to the great mass of your readers to know that the analyses of the guano, &c., on the newly-discovered islands are most satisfactory, and that active measures are being taken to secure them for the British farmer. I enclose copy of the analyses by Professor Way, of London, and Professor Anderson, of Glasgow.

I am, sir, your most obedient servant,

JAMES BELL.

The Queen's Hotel (late Bull and Mouth),
St. Martin's-le-Grand, London, August 16.

GUANO FROM NEWLY-DISCOVERED ISLANDS.

15, Shuttle-street, Glasgow, July 16.

SIR,—The following are the results of analyses of the four samples of guano, marked Nos. 1, 2, 3, and 10, left by you at the laboratory :—

	No. 1.	No. 2.
Water	4.00	8.52
Organic matter and ammoniacal salts	9.12	11.45
Phosphates	21.88	51.59
Sulphate of lime	35.41	9.29
Alkaline salts	8.00	10.96
Sand	21.59	8.19
	100.00	100.00
Ammonia	0.77	1.31

	No. 3.	No. 10.
Water	13.52	14.73
Organic matter and ammoniacal salts	15.87	15.74
Phosphates	59.60	57.99
Alkaline salts	8.29	9.06
Sand	2.72	2.48
	100.00	100.00
Ammonia	1.16	1.85
Phosphoric acid in alkaline salts	1.31	2.47

These analyses show that this variety of guano is one of much value, and highly deserving of importation. It will be observed, however, that all the samples are not of equal value, and that No. 1 is very inferior to the other three. In fact, the large quantity of sulphate of lime which it contains would render it of little value, and not likely to pay the expense of importation. Of the other three, I consider Nos. 3 and 10 to be the best, both because of the absence of sulphate of lime and the large quantity of phosphates they contain. They also contain phosphoric acid in the alkaline salts, which the other two samples do not. This adds considerably to their value, for the quantities of phosphoric acid found in the alkaline salts are equivalent, in No. 3, to 2.83 per cent. of phosphate of lime, and in No. 10 to 5.35 per cent. This phosphoric acid, however, existing in the soluble state, is more valuable than an equivalent quantity of phosphate of lime would be.

In comparing these guanos with the different varieties at present imported, they appear to approach most nearly to Saldanha Bay, but are superior to much of that variety now met with. The samples analyzed being brought home in small quantity only, and very probably from the surface of the bed, may prove of inferior quality to that which may be obtained when the supply is properly opened up, and even inferior to other portions of the deposit; and, should it be decided to import this guano, as I cannot doubt it will be, I should recommend that, in the meantime, that which most closely resembles No. 10 should be brought home in quantity; but that a careful exploration of the whole island should be made, so as to ascertain whether any portions differ conspicuously in appearance, and from all these deposits small quantities, carefully selected, so as to give an average, should be brought home, and their value determined by analysis.

For the present, it would be prudent and judicious to fix the value of this guano as the same as that of Saldanha Bay at the price of which variety I have no doubt large quantities would be taken by the farmer; and when the ships go for it, they should make search for varieties likely to prove still more valuable, and which may very probably be found. Should it appear desirable to do so, I shall be most happy to give such instructions as may assist in the search.

I am, sir, your most obedient servant,

THOMAS ANDERSON.

James Bell, Esq., 25, York-place, Edinburgh.

ANALYSES OF FIVE SAMPLES OF GUANO, ETC., MR. BELL RECEIVED JULY 27, 1853.

	Per centage composition.				
	No. 10.	No. 11.	No. 13.	No. 14.	No. 15.
Moisture	14.66	1.26	1.16	7.95	3.62
Organic matter and salts of ammonia	15.99	6.77	6.89	11.24	9.68
Sand, &c.	2.30	4.86	7.50	8.10	3.36
Phosphate of lime and magnesia	57.20	80.33	79.73	20.10	76.70
Hydrated sulphate of lime	..	0.76	0.84	42.88	4.78
*Alkaline salts and loss	9.85	6.02	3.88	9.73	1.86
	100	100	100	100	100
Nitrogen	1.50	0.98	0 92	3.15	1.54
Equal to ammonia	1.82	1.19	1.11	3.82	1.87

Aug. 11, 1853. J. THOMAS WAY.

—The Times.

READING FARMERS' CLUB.—CORN AVERAGES.—At a recent meeting of this club, the subject of the present method of taking the corn averages was fully discussed. After a long and interesting debate, the club unanimously passed two resolutions, which were as follow :—"It is the opinion of this meeting, first, that the present mode of taking the averages of the price of corn is irregular and imperfect, and consequently acts unjustly on the growers of corn, and particularly on those who pay tithe or rent, which is regulated by the published return. Secondly, that the returns of all corn sold should be made by the growers only at the time of sale, and these returns to have the signature of the purchaser attached, to ensure correctness; and that parties neglecting to make returns should be liable to a small but sufficient penalty, which should be strictly enforced."

* Alkaline salts in No. 10 include 2.37 per cent. of phosphoric acid, equal to 4.88 of phosphate of lime.

NORTH LINCOLNSHIRE AGRICULTURAL SOCIETY.

The seventeenth anniversary of this excellent society, of which Earl Yarborough is the president, took place at Gainsborough, on Wednesday, and never has any previous meeting of the society gone off more successfully, whether as regards the quantity and quality of the stock exhibited, or as to the number of persons who visited the show yard.

The show of stock, implements, &c., took place in a spacious field, extremely well adapted for the occasion, situate on the Morton-road, belonging to Mr. John Hartley, and in every class the exhibition was of a first-class character.

The Judges were—for

Beasts.—A. L. Maynard, Esq., Marton-le-Moor, Ripon; John Gamble, Esq., Shouldamthorpe, Downham; Wm. Linton, Esq., Sheriff Hutton, York.

Sheep and Pigs.—John Painter, Esq., Burley-on-the-Hill, Oakham; Thomas Caswell, Esq., Quadring, Spalding; John Clarke, Esq., Long Sutton.

Horses.—T. B. Colton, Esq., Eagle Hall, Lincoln; G. B. Child, Esq., Market Stainton, Wragby; Botterill Johnson, Esq., Frodingham Bridge, Driffield.

Engineer.—C. E. Amos, Esq., C.E., Grove, Southwark.

Extra Stock.—The judges of beasts and Mr. Nutt.

SHORT-HORNED CATTLE.

For the best bull above one year old, 20*l.* to Mr. Wm. Torr, of Aylesby.

For the best bull three year old or upwards, 5*l.* to Mr. Wm. Torr, of Aylesby; second, 3*l.*, to William Hutton, Esq., of Gate Burton.

For the best two-years-old bull, 5*l.* to George Bland, Esq., of Coleby Hall.

For the best yearling bull, 5*l.* to Mr. Wm. Torr, of Aylesby; second, 3*l.*, to G. M. Alington, Esq., of Swinhope House.

For the best bull calf under a year old, 3*l.* to Mr. W. B. Wingate, of Hareby; second, 1*l.* to Mr. T. Brooks, of Croxby.

For the best cow, more than four years old, having produced a calf at its natural time, within nine calendar months at the time of showing, 5*l.* to Mr. Thos. Tongue, of Beckingham; second, 3*l.* to Mr. Wm. Torr, of Riby.

For the best heifer, three years old, having produced a calf at its natural time, within nine calendar months at the time of showing, 5*l.* to Mr. Wm. Torr, of Aylesby; second, 3*l.* to Wm. Hutton, Esq., of Gate Burton.

For the best two-year-old heifer, 5*l.* to Wm. Hutton, Esq., of Gate Burton; second, 3*l.* to ditto.

For the best one-year-old heifer, 5*l.* to Wm. Hutton, Esq., of Gate Burton; second, 3*l.* to ditto.

For the best she calf under one year old, 3*l.* to Wm. Hutton, Esq., of Gate Burton; second, 1*l.* to John Hewison, of Harrington.

SHEEP.

For the best ram of any age, 10*l.* to Mr. William Abraham, of Bartnetby-le-Wold.

For the best shearling ram, 7*l.*, to Mr. Wm. Abraham, of Barnetby-le-Wold; second, 3*l.*, to Mr. Chas. Clark, of Scopwick.

For the best two-shear ram, 5*l.* to Mr. Wm. Abraham, of Barnetby-le-Wold; second, 3*l.*, to ditto.

For the best aged ram, 5*l.* to Mr. Charles Clarke, of Scopwick; second, 3*l.*, to Mr. W. Abraham, of Barnetby-le-Wold.

For the best pen of ten ewes, having suckled lambs up to the 10th July, 5*l.* to Mr. H. V. Grantham, of Sturton; second, 3*l.*, to Mr. Thomas Grantham, of Stixwold.

For the best pen of ten shearling gimmers, 5*l.* to Mr. Wm. Abraham, of Barnetby-le-Wold; second, 3*l.*, to Mr. H. V. Grantham, of Sturton.

For the best pen of ten she lambs, 3*l.* to Mr. Henry Codd, of Everton; second, 1*l.*, to Mr. H. V. Grantham, of Sturton.

HORSES.

For the best stallion for hunters, 10*l.* to Mr. John Haigh Fuller, of Shaw-hill, Halifax.

For the best stallion for draught horses, 10*l.* to Mr. Daniel Housin, of Bathley.

For the best mare for breeding horses, with a foal at her heels, or having been put to the horse in the season of 1853, 7*l.* to Messrs. J. B. and S. Slater, of North Carlton; second, 3*l.*, to Mr. Thomas Grantham, of Stixwold.

For the best mare for breeding draught horses, 7*l.* to Mr. Thomas Williamson, of Walkeringham; second, 3*l.*, to Mr. John Glover, of Willoughton.

For the best cart filly, one year old, 3*l.* to Mr. Jos. Roberts, of Ragnall.

For the best cart filly, two years old, £5 to Mr. John Abraham, of Naith Park.

For the best cart foal, 2*l.* to Mr. Edward Howard, of Fenton.

PIGS.

For the best boar, large breed, £4, to Mr. R. Crossley, of Newton; second, £2, to Mr. Rd. Cressey, of Brigg.

For the best boar, small breed, £4, to Mr. George Burwell, of Thonock.

For the best sow, large breed, having had a litter since 1st March, 1853, £4, to Mr. Richard Cressey, of Brigg; second, £2, to the Rev. Henry F. Hutton, of Spridlington.

For the best sow, small breed, ditto, £4, to Mrs. Hutton, of Gate Burton; second, £2, to Mr. F. Lacy, of Panton.

For the best three breeding pigs of the same litter, not exceeding six months old, large breed, £2, to Mr. R. E. Duckering, of Northope.

Ditto, small breed, £2, to Mr. T. M. Richardson, of Hibaldstowe.

EXTRA LIVE STOCK.

Mr. Thomas Tongue, of Beckingham, £1, for a white cow; Mr. H. G. Skipworth, of Rothwell, £1, for a pen of six Southdown ram lambs; Mr. H. G. Valentine, 5s., for four shear fat ewes; Mr. J. G. Little, of Blyborough, £1, for a coaching stallion; Mr. John Hill, of Grove, £2, for an entire cart colt; Mr. T. Everett, 5s., for an entire hunting colt; Mr. J. G. Little, of Blyborough, £1, for a coaching gelding.

By the Hon. Sir Henry Dymoke, Bart.—To the owner of the best pen of 20 wether hogs, exhibited at Horncastle spring mart, a silver cup, value £5, to Mr. Fowler, of Kirkby.

By Messrs. Smith, Ellison, and Co.—To the owner of the best pen of 50 wether hogs, exhibited at Caistor fair, a silver cup, value £5, to Mrs. Richardson, of Great Limber.

To the owner of the best pen of 20 wether hogs, exhibited at Lincoln April fair, a silver cup, value £5, to Mr. C. Battersby, of Scotherne.

Hornsby and Son, Grantham, £20, for a six-horse-power steam engine.

CHLOROFORMING BEES.—The following mode, published by Mr. D. Smith in the *Edinburgh Courant*, is very simple: I set down a table opposite to, and about four feet distant from the hive; on the table I spread a thick linen cloth; in the centre of the table I place a small, shallow, breakfast plate, which I cover with a piece of wire gauze, to prevent the bees from coming in immediate contact with the chloroform; and into this plate I pour the chloroform. I now quickly and cautiously lift the hive from the board on which it is standing, set it down on the top of the table, keeping the plate in the centre; cover the hive closely up with cloths, and in 20 minutes or so, the bees are not only sound asleep, but, contrary to what I have seen when they are suffocated with sulphur, not one is left among the combs; the whole of them are lying helpless on the table. You now remove what honey you think fit, replacing the hive in its old stance, and the bees, as they recover, will return to their domicile. A bright, calm, sunny day is the best; and you should commence your operations in the morning, before many of them are abroad.

OUR AGRICULTURAL PROSPECTS.

Several circumstances combine to render the agricultural prospects of the country at the present time a subject of more than ordinary interest. The autumn seed time was most unfavourable. The spring season was so far similar—the rainy weather continuing to a very advanced period—that it was not possible in many districts to sow wheat, and that sown is necessarily both thin on the ground and must arrive late at maturity. Throughout the summer the weather has not been of a genial character for this crop. Having regard to these adverse circumstances, and having both carefully noted the agricultural reports from the provinces, and ascertained the opinions on the subject of parties whose personal observations have furnished them with the means of forming a right judgment, we have arrived at the conclusion that the yield of wheat per acre in the approaching harvest will, at most, be only about four-fifths or five-sixths that of average years, according as the season intervening between the time we write and the completion of the harvest, may prove favourable or otherwise. We are inclined to think, indeed, that not more than the four-fifths can be reasonably anticipated under the most favourable weather. Assuming this to be so, the average annual production of wheat by this country being about 24,000,000 quarters, there will thus be a deficiency of about 5,000,000 qrs. If to this we add the deficiency that must necessarily arise from the very limited breadth of land sown with wheat—probably nearly another one-fifth—and that an importation of 8,000,000 quarters has been, on the average, required and obtained during the last few years, it will be seen that we shall require the importation of the astounding quantity of nearly 18 000,000 of quarters of wheat during the period intervening between the harvests of 1853 and 1854.

Formerly, this aspect of affairs alone would have been of itself sufficient to have created a panic in Lombard-street; and, indeed, throughout our entire monetary and mercantile circles. And if to this were added the present state of affairs in the East, and the uncertainty that must exist, at least now and for some years hence, touching the potato crop, we might feel it our painful duty, at the time we write, to anticipate a period of panic and distress scarcely surpassed by that of 1847-8. Happily, however, there never was a brief period of some six or seven years in which the circumstances of the country, in some other respects, have undergone so great and beneficial a change. Up to 1847-8 Nature had not pointed out the immense gold mines that have since been discovered, and which have now furnished us with the means of purchasing any quantity of foreign corn that we may require. And nearly up to that period, also, Art had prevented us from freely obtaining a supply of that corn, even if we had the gold, except at a time when we had to purchase it at the highest prices. In making these remarks, we are not about to enter upon the currency and free-trade questions. If we did so, we feel that we could arrive at no other conclusion than that, in the present aspect of affairs, neither the followers of one nor the other of our great political parties have much, if any, occasion to boast. The gold mines and free trade have worked admirably together. The former, in fact, have set at nought all human calculations; and we are free to say that we are so far exempt from the spirit of politics or faction, that we can unreservedly attribute the present comparative prosperity and safety of the country to the wisdom of God rather than to the wisdom of man.

That, indeed, in the present state of circumstances, not even the greatest "bear" in Capel-court has occasion to greatly exult, nor the strongest "bull" to greatly "croak," may, we submit, be satisfactorily demonstrated.

The periodical returns of the Board of Trade show the exports of the country during the month ending 5th of June to have been £1,187,558 beyond that of the corresponding period in the preceding year; whilst if the entire first five months of the present year were included, they show about a corresponding ratio, amounting as they do to a total increase in five months of no less a sum than £7,313,528. Assuming this increase of exports, at the rate of £17,000,000 a-year, to be only moderately progressive, and neither taking an undue gloomy nor an excessively sanguine view of our other kinds of crops and produce than wheat, and of the continued productiveness of the gold mines, we may surely see looming in the period between the harvests of 1853 and 1854 amply sufficient to furnish the country with the means of purchasing from foreigners an extra 9,000,000 or 10,000,000 quarters of wheat, without any very great draft upon our resources or prosperity.

In taking this view of the case, if we were to affirm, for the sake of the argument only, that we looked rather to the influence of the gold mines than to free trade for the means of keeping our trade in a brisk and healthy state during the ensuing year, we find that we should be fully borne out by no mean authority. One of our daily contemporaries thus records its opinion of the continued productiveness of the gold mines, and the effect thereof upon the trade, and agriculture, and commerce of the country:—

"The amount of gold produce of Australia, during the year 1852, is returned at £14,163,264, exclusive of gold dust in the hands of diggers, storekeepers, and others, and on the road to Melbourne and Geelong; and it is, probably, no exaggeration to say that we may calculate upon an annual yield of not less than £19,000,000. Where so cheering a prospect of a large and speedy return for labour is held out to all comers, we need not wonder at the increasing number of fresh arrivals. In the month of January of this year 10,000 souls were added to the population of Melbourne alone; and there is no prospect of a diminished rate of increase. No doubt a very large proportion of the emigrants have hitherto been attracted by the temptation of the gold fields, but as the first excitement dies away, and as the yield becomes more regular, the tendency to settle down in ordinary branches of industry will increase. Of this we have sufficient proof. Great as is the importance of the gold discoveries as regards the progress of Australia, their influence upon the condition of our own industrial population is not less remarkable. Emigration, concurrently with free trade, is everywhere raising the demand for labour, and the remuneration of the labourer."

In the face of testimony like this—evidence, be it observed, in some degree, if not opposed, at least not favourable to our own somewhat more sanguine view of the beneficial influence of the Australian mines upon the prosperity of the country—we feel that we ought to be clothed in the attire of a venerable female if we were loud "croakers" at the present time. That the prices of agricultural and other commodities will rule even higher than at present we do not entertain a doubt; that the price of wheat will further attain a higher standard, as compared with other commodities, than it has done for some years past is also highly probable; but that there will be either such an efflux of bullion, or influx of foreign commodities, as to occasion any serious inconvenience among our monetary and mercantile circles, is a thing that we cannot at present bring our minds to believe.

If we turn from the corn to the wool trade, we find that, at the time we write, the country must contain within itself the necessary raw material for carrying on for some time hence an extensive export trade.

The tables of imports of wool, as given by the Board of Trade, for the first five months of the years 1851, 1852, and 1853, are as follows:—

	Lbs.
1851	21,578,190
1852	18,352,760
1853	27,5 7,476

It is proper to remark, that the whole of this large increase—less about 1,000,000lbs.—is from the continent, and not from our colonies; but this may be considered rather as a favourable indication than otherwise. If it show that the people in our colonies have turned their attention rather to the production of gold than to the production of wool, it also shows that the subjects of foreign powers are conceding to the population, who, notwithstanding the extent of emigration, still remain in the districts of our woollen manufacturers, a greater share or proportion in this department of manufacturing industry. The tendency, indeed, in the price of wool to advance, in the face of this large increase of imports, clearly demonstrates this much.

To turn to the meat markets, we note that at the time we write the top prices at Smithfield per 8lbs., sinking the offal, are as follows:—Beef (Scots), 4s. 4d.; sheep, 4s. 10d.; calves, 4s. 8d.; small pigs, 4s.; lambs, 6s.

That these prices are remunerative to our agriculturists will not, we think be denied; and that, coupling them with the average prices of all other descriptions of agricultural produce, the banking establishments in our purely agricultural districts will experience a considerable augmentation in their deposits, rather than of drafts upon them, is to us equally clear. Hence it would appear highly probable that, even should there be such calls upon the bullion in the Bank of England, in payment for foreign wheat, as to occasion a temporary reduction in its amount, the banks in the country will be in a position, to some extent, to supply the deficiency. After all, indeed, that can be said, no great national depression can arise from this. It can only be a matter between individuals, in town and country, whether discounts or the interests of money be high in London, or in Shrewsbury, Lincoln, and similarly great centres of agricultural districts, and *vice versa*. Of late years, indeed, the much lower rates of discount that have prevailed in the metropolis, as compared with those ranging in the provinces, would seem to indicate that no great evil or wrong could arise from their experiencing a nearer approximation to equality.

We notice that another contemporary attributes the advancing prices of meat to the circumstances of "the farmers having been frightened into selling off their cattle to an immoderate extent," and to "the inability of foreigners to do more than a very little for us" in its supply.

We cannot but deprecate—strongly as we desire to maintain the existing monetary and free-trade system—the publication of such merely party assertions and arguments that refute each other, and the untenableness of which it can, in fact, require but a very little reflection to detect.

We think that, so far from "the farmers having been frightened into selling their cattle" having been the cause of what is described as "the never to be sufficiently deplored blank in our meat markets," that it is rather owing to their having converted a portion of our arable land into pasturage, that we have now both had so considerable a rise in the wheat market, and the farmers placed in a position to hold back their cattle.

Certainly, the "deplorable blank" cannot have been occasioned by the inability of foreigners to do more than "a very little for us;" for we find, on reference to the official returns of importations of heads of cattle into London for the week in which we write, and the corresponding week of the six preceding years, that they have been as follows:—1847, 3,719; 1848, 4,108; 1849, 4,141; 1850, 4,707; 1851, 4,355; 1852, 5,299; 1853, 10,811.

In the face of returns like these, we think too low an estimate has been formed both of the intelligence of our own graziers and the capabilities of those of foreign countries. The importation in one week in July of 10,811 head of stock, as compared with the importation of 5,299 in the corresponding week of 1852, and the Smithfield report for the same week in 1853, setting forth that "the supply of stock from our own provincial districts was seasonably large and full of weight," are, we think, decisive of this point, and that we have no cause to apprehend a famine in the meat market.

We do not entertain a doubt that the rise in price has been principally occasioned—first, by the increased consumption consequent upon the combined effect of the gold discoveries and free trade; and, secondly, by the disease among cattle and sheep.

We are fortified in this opinion by the tenor of our reports from the provinces, an extract from one of which it may not be out of place here to give, as evidencing not merely this, but that we have not in the preceding remarks formed too low an estimate of the wheat crop of 1853. The writer, it should be stated, is referring to the state and prospects of agriculture in Derbyshire and Staffordshire. He says—"Wheat, I am sure, in this district will be not less than a third deficient, considering the amount of average and so many thin crops, owing to the bad seed time and wet winter. Cheese and meat have been enhanced in value to some extent by the epidemic of last year, which was nearly universal. We suffered also from dry pasture, occasioned by drought. These causes combined to abridge the produce of both articles.

"The relative price of meat and cheese now and last year, I believe to be about thus:—Meat, 4½d. to 5½d. per lb., now 6d. to 6½d. per lb.; cheese, 5d. to 5½d. per lb., now 6d. to 7d. As regards the potato disease, I do not hear anything of it as yet, but is rather too early for it to be developed."

We note that, carefully striking an average, the reports of the state of the grain crops throughout Europe are of an unfavourable character, and that we must look almost to America alone for a bountiful harvest. The quantity of rain fallen at Greenwich, it is deserving of remark, has been, from the 1st to the 14th of July, 3·72 inches, or nearly two inches above the first half of July of ordinary years. Assuming that this excessive fall of rain has been tolerably equal over the entire country, it is at this peculiar juncture a significant fact, and would tend to strengthen the conclusion that the country will certainly require an importation of not less than 18,000,000 qrs. of wheat between the harvests of 1853 and 1854. Happily, our farmers are the holders of unusually large stocks; and coupling this with a good harvest in America (which country has ever been the best customer for our manufactures, in return for her corn), and the amount of bullion both now in the Bank of England and that which must be certainly forthcoming from Australia, we feel strongly that England, and more especially the agricultural portion of her people, will "tide over" the ensuing year with comparative comfort and freedom from embarrassment—albeit, we think we should err if we anticipated a period of general prosperity equal to the year that has passed. Under any circumstances, a deficiency of 10,000,000 qrs. in our wheat harvest—entailing, as it probably will, upon the country a cost of £25,000,000—is a matter too serious not to be felt in some way or other. The amount, nationally speaking, must be paid by us either in the shape of labour, economy, privation, or reduced profits. Happily, the combined effects of the Australian mines and free trade will now enable us to liquidate the account, if we think proper, wholly by the former article. No odium can longer attach to the legislature, or to the agricultural or the banking interest, for the occurrence of such a necessity. Nor do we think any odium will attach to us—disagreeable as it may be to believe unwelcome truths—for having thus, in a spirit entirely free from prejudice, party, or interest, endeavoured to place the case before the country in its true light, and thereby incite timely spirit of industry, prudence, and provident foresight.—Bankers' Magazine.

THE WHEAT TRADE.

SIR,—In your review of the "British Corn Trade," last week, you adverted to the peculiar position in which that branch of our commerce stands at the present time, and the probability that there may be a still greater reason for grave consideration on the part, not only of those actively engaged in the corn trade, but of the Government, as to how the necessary supplies shall be obtained for the ensuing year. I am not an alarmist, having no wish unnecessarily to excite the fears of the timid, or to raise the price of corn to an undue and factitious rate; but at the same time, it is perfectly right to look the difficulties of our position in the face; and to be prepared to meet them we must be acquainted with their nature and extent. It is now reduced to a certainty that the growing crops of wheat will, in the aggregate, be far below an average one, whether the actual yield be good or bad, owing to the impossibility in the autumn of sowing the usual quantity. And this is especially the case in Ireland, where the disinclination to cultivate for wheat increases every year, independent of the impossibility of sowing anything like the usual breadth last autumn. This being the case, it is necessary to inquire into the sources from whence we are to obtain a supply sufficient to last us until the harvest of 1854.

The principal corn-exporting countries may be divided into four grand sections, namely, those bordering on the shores of the Baltic, and embracing the northern sea coast; those on the Atlantic and Mediterranean sea board; those on the Black Sea and its appendages; and the continent of North America, comprising the United States and the British colonies. From all these quarters we have hitherto obtained an ample supply of wheat—for it is to this, as the most important cereal, that I

propose to confine the inquiry—and there is no doubt that they will still, one or another of them (for ALL cannot fail us in ordinary years) furnish us with the needful supply. But the present year is one of those peculiar seasons in which the most correct calculations resting on former experience are liable to be neutralized; and the question therefore remains to be solved, from what quarters may we expect such a supply as shall make up the deficiency certain to arise in our own crop?

It is now a well-known and admitted fact, that the supply of wheat from Northern Europe has for some years been declining in quantity. Many causes have contributed to produce this falling off; but we will mention only four of these, as being of a permanent character, and likely still further to diminish the exporting power. The first of these is the fact that the population of Europe has increased to the extent of from 80 to 100 millions since the peace of 1815, and consequently there must have been a corresponding increase of consumption. When Mr. Jacobs drew up his report on the corn trade in 1827, he estimated, from the information he obtained on the continent, that the increase in the European population during the twelve years of peace amounted to twenty-six millions. Twenty-six years more of peace have passed since then; and as this increase goes on upon the principle of compound interest, we may justly assume that the present population of Europe is what we have stated, in advance of that of 1815.

The second cause, is the absorption of the land in the cultivation of the Silesian beet root, for the purpose of manufacturing sugar. The object of the Austrian, French, Russian, Prussian, and Belgian governments, not to mention the smaller states, is to render their dominions independent of a foreign supply of sugar, and at the same time to extend a manufacture highly profitable and beneficial. The extent of land thus absorbed cannot be exactly ascertained, but it may be proximately estimated at half a million of acres—so that, with a rapidly increasing consumption, there is a large diminution in the breadth of land devoted to cereal produce.

The third cause is the operation of the landwehr, or conscription law, now generally adopted by the continental nations; by virtue of which every male subject—whatever be his rank, station, or calling (except ecclesiastics)—when he arrives at the age of twenty years is bound to serve for three years in a regiment of the line as a private soldier. We may readily conceive that this infusion of the military spirit is inimical to the sober pursuits of industry, and must necessarily abridge them; and that the abstraction from the rural population of the entire body of the youth at that age when labour is a pastime, and the habit of it begins to be formed, must have its effect upon the after life. The desultory habits incident to a soldier's life—half spent in idleness, and the other half in acquiring a taste for military employments—are too palpable to admit of dispute, and too opposed to industrial pursuits not to endanger their progress when conducted upon so extended a scale as is practised on continental Europe.

A fourth cause is the sub-division of the land into small proprietaries, which has been adopted by Prussia, and is now the practice in almost all the continental states and kingdoms. Whatever may be the ultimate effect of this system upon the bulk of the people, it is certain that at present it has not caused an increase of cereal production, but rather the contrary. The class of people in Germany, as well as in France, to whom this applies, were too poor and too ignorant—when this power to become landed proprietors was granted to them—to cultivate their holdings to the best advantage; and their chief aim has been to raise enough of inferior produce for the support of themselves and their families.

Such are the principal causes operating to diminish the growth of cereal produce in northern Europe. It may be alleged that the masses there are not consumers of wheaten bread, but are fed chiefly on rye and other inferior corn bread. But it is quite evident, that whatever land is abstracted from cereal cultivation of any kind must diminish the quantity produced; so that, whilst the increase of population renders a larger amount of inferior cereals necessary, there is not only a less breadth of land whereon to raise it, but also a diminution of industrial power to be applied to its cultivation.

The second section comprises the kingdoms of France, Spain, and Portugal, on the Atlantic; and the same countries, with Italy and the opposite shore of the Adriatic, Greece, the southern part of Asia Minor, Egypt, and the range of the African coast bordering on the Mediterranean, with the various islands of that sea. Of these, the two countries of France and Egypt furnish by far the largest quantity for exportation. Spain is not often in a condition to export wheat; an abundance is grown in the interior, but the expense of transit is so heavy, owing to the badness of the roads, that it would not pay the grower to send it. In Castile, for instance, the price of wheat is seldom more than 1s. 6d. per bush.; but so heavy is the expense of conveying it to the coast, that the Andalusians find it cheaper to import it from New York, paying 4s. 6d. per bushel, besides freight and expenses. Portugal furnishes no wheat for exportation. Greece is just beginning to know the value of an exporting corn trade. Of Asia Minor the same may be said; and the productve power of the Delta of the Nile has never been fully tested, although the quantity exported from thence increases largely every year. With regard to the African coast from Barca to Morocco, but little wheat is at present exported. Its cultivation is chiefly confined to the Highlands of Ethiopia, and what is grown is mostly consumed at home; it is probable, however, that wheat will be obtained from thence by way of the Red Sea. Malta, Gibraltar, and the Ionian Islands produce no wheat; and are themselves supplied with that grain from Odessa. Sicily is capable of growing large quantities of wheat; but agriculture has long been kept in a depressed state by the absurd policy of the Government, which prohibited the exportation of wheat under a heavy penalty. This restriction is now removed; but it will require many years, under such a Government, to recover the rural population from the semi-barbarism superinduced by the laws. Italy, too, exports but little wheat; although there is much land capable of bearing large crops: absurd legislation here also prevents improvement. An offer was recently made by an English engineer to drain the Pontine Marshes; but Pio Nono cut the matter short by saying, that "if God had intended them to be drained, he would have drained them himself."

France and Egypt, then, are the only two wheat-exporting countries in this section that can be depended on; but it is now evident that the former exported too freely the last year, and is now become, in consequence, an importing country: we cannot therefore expect that she will be able to supply us with any great quantity next season. To Egypt we may look with confidence; possessing, as she does, a tract of land on the banks of the Nile, of inexhaustible fertility; and under the stimulus of a constantly open market, we may calculate safely upon an increase of her exporting power.

The third section comprises the countries bordering on the Black Sea and the Sea of Azoph. This includes the Turkish provinces of Roumelia, Bulgaria, Wallachia, and Moldavia; the Russian provinces of Podolia, Volhynia, &c.; and the country north of the steppes bordering on the Sea of Azoph. The depôts for these districts are the ports of Odessa, Marianople, and Taganrog in Russia; and Galatz, Ibraila on the Danube, Varna on the coast, and Adrianople, in Roumelia for the Turkish provinces. The stimulus given to the wheat trade by the opening of our ports has affected this portion of the world more than any other; and it is impossible to say to what exteot the cultivation of wheat may be carried in the rich and boundless tracts of alluvial land in these provinces, as well as those of Russian Poland. It is to these, in fact, alone, that we can in future look with certainty for a supply in any emergency like that of the present period; and, if peace continues, we can have no fear of a want of wheat.

The fourth section, North America, will have but little to spare for us in future. Her export of wheat and flour is not greater than it was forty years ago, and consumption still keeps a-head of production; which, if space allowed, we could prove by statistics. But besides this, new and extensive markets have been opened up for American flour in the gold regions of California and Australia, which most certainly will in future greatly curtail the exportation to the United Kingdom. We have taken the whole continent as one country, because the same reasoning applies to both the United States and the British provinces. In both consumption keeps pace with production, and both have the range of the new markets referred to, to divert the supplies that would otherwise come to our own ports.

The summary of our position, therefore, is as follows:—We have the prospect of a large deficiency in the stock of wheat at

the ensuing harvest. Owing to a similar deficiency France is likely to be an importing instead of an exporting country, and thus, for the next season at least, will compete with us for the surplus of the wheat-exporting countries. In neither is there any stock of wheat, upon which to commence after harvest. Our average importation of wheat and flour for the last twelve years has been 4,000,000 qrs. per annum; and taking the probable deficit of the present crop at one-fourth, we shall want at least 8,000,000 quarters between the two harvests.

On the other hand, the export of wheat from the Baltic ports declines every year; and there is reason, too, to suspect that the crops there are suffering from the same cause as our own and those of France, which will still more reduce their exporting power. From the United States and Canada we must also look for a considerable falling off in the supplies of next season; and the only quarters on which we can with certainty depend, for furnishing ourselves with what we shall require, are the countries bordering on the Black Sea, and Egypt; and for these we may expect a vigorous competitor in France.

It is my desire that your readers will test the correctness of these premises by a rigid inquiry, and draw their own conclusions from them should they find them substantiated. The subject is undoubtedly one of national importance, and will suggest grave considerations for the statesman as well as the merchant and the agriculturist. I am, &c, S. C.

—Mark Lane Express.

BLIGHTS, THEIR CAUSE AND REMEDY.

SIR,—There are just now many important agricultural questions in debate, but none so much so as *blights* of various kinds, their *cause and remedy*.

In this day's *Suffolk Chronicle* it is stated that *cutting off* the tops of diseased potatoes is the best mode of preventing the disease causing the decay of the tubers. This is contrary to the opinion of most persons, drawing-up the stalks being the most prevalent mode adopted, to which I am a convert, from having practised every mode suggested; and as the potato disease is very prevalent, if not general, I state the reason why.

It is said by some that the cause of the disease arises from not renewing the stocks from seed. I happened, however, to be growing a stock of potatoes the first year the disease occurred, which had then been recently raised from seed; but these were equally affected with others in the neighbourhood which had not been renewed from seed. This and other circumstances led me to conclude, that "the stock being worn out by constantly planting the tubers" is not the cause of the blight. It happened that this was the first year that I tried guano as a manure for potatoes. They were planted in a field forty rods in length to the extent of half an acre, and some two hundred-weight of guano was applied; alongside of these, three rows of forty rods in length were planted without manure, and one row of small potatoes which had sprouted green. I first observed black spots on the portion manured with guano, but all were eventually diseased. Those manured being double or treble in quantity and size of course showed the effect most; but in each case the tubers nearest the stems were most affected, in fact were rotten, whilst the tubers produced, or the runners, were chiefly sound. This and similar circumstances led me to conclude that the disease first attacks the leaf and stem, and I am not convinced to the contrary by all that has been since written on the subject.

There can be no doubt but that the tubers cease to increase in size as soon as the leaves are affected, and thus the stems may as well be cut or pulled off the instant any appearance of disease occurs; and if such is the fact, then the question is—which is it most rational to conclude to adopt? If the tops are cut off, the sap issuing out of the stumps left keeps the ground quite wet for many days, however dry the weather continues; but if the tops are drawn up, no appearance of wet remains. This I have seen in many instances this year since the attack of the disease. In some cottage-gardens and allotments the tops are cut off; in others they are pulled off; and in some a portion are cut and a portion drawn up, to ascertain whether any difference occurs. This is all very right; but, as the tubers grow no larger, an additional experiment may be tried.

If the potatoes are taken up before the skins are set they will not keep, if put in a heap; if left just as they remain after the tops are cut off or pulled up, they will dry slowly in most soils. Thus it appears that breaking-up the land with three or four-tined forks would so loosen the soil as to cause it to dry more rapidly, and stop the disease if it has not affected the tubers. The rows of potatoes should be lifted first, and then the space between, to let in the air and light. A man will go over a large space in a day at this work.

But to return to the cause of the blight in potatoes. As it affects early and late planted at nearly the same time, it surely must be atmospheric, and no remedy exists to prevent it. If it is caused by animalcules (the vastatar), as some suppose, salt, seaweed, charcoal, &c., may prevent disease. But why is not a systematic mode adopted to prove the result of applying the specifics ("nostrums")?

It is a great national question, or, I may say, it is a question that concerns every country, as it seems to prevail more or less everywhere—in America (its native climate and soil) as well as in England; and American potatoes brought over and planted here are equally affected with our own.

Potatoes left in the ground (self-sown) or planted early in the spring—planted in June, and in one case I see frequently planted the first week in July on land never cropped before, the site of an old house pulled down—are all affected at nearly the same time, those which have large tubers and others which have none. Drying the sets is not a preventive, as I have proved. No crops of potatoes seem to escape the disease in this neighbourhood this year, let the soil be sand, or clay, or any variety. Early or late, kidney or round, none are fit to eat when three or four days out of the ground; and potato-onions seem affected with the same disease, and are rotting.

I have always presumed that the various varieties of potatoes were obtained by sowing the seed; if so, constantly planting the tubers is not the cause of the failure. If a preventive exist, it appears that it must be by steeping the sets in brine, using vitriol or other corrosive substances, to destroy the fungus or animalcula, or whatever it may be that adhere to the roots, if it is diseased sets that cause the disease; at any rate, this process would clear up some of the surmises which exist.

Some years since—before the potato disease existed—I had a few potatoes sent me as a present in the month of June, and it being so late, and the weather dry, I planted them whole; and as soon as the stems were three or four inches high I drew the tubers from them and replanted them; and when the second growth was about the same height I drew the sets from them also, and replanted them a third time, and I believe I obtained as many tubers from the second and third as from the first. I state this circumstance to show that if the disease is caused by diseased sets, by taking them away *it is possible* it may prevent the crop being diseased.

I leave it to you to decide whether to insert this or not.

I am, sir, your humble servant,

Witnesham, Ipswich, Aug. 4. C. POPPY.

P.S. Beans and peas are blighted in this neighbourhood apparently with the same disease as the potato; the pods of the peas are thickly spotted with black.

STATISTICS OF ENGLAND.—"McQueen's Statistics of the British Empire" gives the quantity of cultivated land in England at 25,632,000 acres: of these he computes that, 15,379,200 acres were pasture and meadow land, and 10,252,800 were garden and arable. He calculates the average value of the whole to be 25s. per acre.

METEOROLOGICAL DIARY.

	Barometer.		Thermometer.			Wind and State.		Atmosphere.			Weat'r.
Day.	8 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
July 24	29.90	29.80	54	68	58	S. West	lively	cloudy	cloudy	cloudy	showery
25	29.82	29.83	52	68	56	W.S.W.	fresh	cloudy	sun	fine	dry
26	29.86	29.90	53	63	59	S. West	v. brisk	cloudy	cloudy	cloudy	dry
27	29.98	29.90	57	70	62	S. West	gentle	cloudy	sun	cloudy	wet
28	29.80	29.87	57	65	59	Variable	calm	cloudy	fine	cloudy	showery
29	29.90	29.85	54	63	58	S. West	lively	fine	fine	cloudy	dry
30	29.80	29.88	57	65	57	W. by S. by N.	brisk	fine	cloudy	fine	dry
31	29.92	29.92	50	68	61	W. by South	var.	fine	fine	cloudy	dry
Aug. 1	29.99	29.89	58	74	54	S. West	lively	cloudy	sun	fine	dry
2	29.89	29.98	58	74	61	E. by North	gentle	cloudy	sun	cloudy	dry
3	30.02	30.0	55	74	60	East. Variable	gentle	fine	sun	fine	dry
4	29.99	30.06	54	74	59	Northerly	gen. air	fine	sun	fine	dry
5	30.11	30.20	50	70	58	Variable	calm	fine	fine	fine	dry
6	30.23	30.19	48	68	58	Every Way	calm	fine	sun	fine	dry
7	30.23	30.21	54	70	56	N. by W., or E.	gentle	fine	sun	fine	dry
8	30.23	30.21	53	73	58	N. Easterly	gentle	haze	sun	fine	dry
9	30.23	30.30	49	75	56	N.E., E. by S.	gentle	fine	sun	fine	dry
10	30.35	30.30	48	77	58	E. by N.	gentle	fine	sun	fine	dry
11	30.32	30.20	54	76	61	E. by N.	gen. air	haze	sun	fine	dry
12	30.23	30.20	53	74	58	E.N.E.	gen. air	fine	sun	fine	dry
13	30.23	30.10	58	72	57	E.N.E.	gen. air	fine	sun	fine	dry
14	30.05	30.0	55	67	57	E.N.E.	brisk	cloudy	cloudy	cloudy	dry
15	30.01	30.01	53	65	56	Northerly	gentle	cloudy	cloudy	cloudy	dry
16	29.83	29.50	53	61	58	S.E.	gentle	cloudy	cloudy	cloudy	rain
17	29.51	29.80	53	71	56	W. by S., Var.	lively	cloudy	sun	fine	dry
18	29.91	29.92	44	69	59	S. Westerly	gentle	fine	sun	fine	dry
19	29.92	29.92	54	76	64	S. West	gentle	cloudy	sun	fine	dry
20	29.87	29.94	62	74	59	S. West	gentle	cloudy	sun	fine	rain
21	30.01	30.0	55	70	62	S. West	gen. air	fine	sun	cloudy	dry
22	29.91	29.88	56	70	61	Variable	calm	fine	sun	cloudy	rain
23	29.79	29.79	55	61	57	Variable	calm	cloudy	cloudy	fine	dry

ESTIMATED AVERAGES OF AUGUST.

Barometer.		Thermometer.		
Highest.	Lowest.	High.	Low.	Mean.
30.260	29.350	82	41	61.6

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
69.84	53.6	62.72

WEATHER AND PHENOMENA.

July 24. Windy. 25. Masses of clouds; fine evening. 26. Dark, blustering day. 27. Much finer and warm. 28. After a wet night, thunder-storm very early. 29. Drizzle. 30. Cloudy; clearing off in the evening. 31. Clouds and gleams.—Nearly 6 inches of rain in July!

LUNATION.—Last quarter, 27th, 10 at night.

August 1. Threatning, cloudy, hot, yet dry. 2, and thence to 15, inclusive. Dry weather; on the three or four first days the temperature was above the average; subsequently below it. 16. With the change of wind, rain returned, and 0.24 of an inch is registered. 17. Clear and fine till 6 P.M., when a singular dense gloom of massive clouds came over from the North. 18. Very fine. 19. Very faint heat; a few drops of rain; much fell after mid-night. 20. Gloomy, with some rain; great rain in the night; damp day; evening fine. 21. Very fine maturing day. 22. Fine forenoon; gloomy and oppressive. 23. After wet night, a damp, close day.

REMARKS CONNECTED WITH AGRICULTURE. It will at a glance be apparent, that weather favourable to the harvest set in on the 29th of July, and continued till the 16th of August, when a change of wind to a S.W. point brought a return of the showery weather. Much corn has been ricked under favourable circumstances; but more remains a-field. We ought, however, to abound in hope and thankfulness. The amended condition of the Irish labourers, who have come over in hundreds, must be a cause of gratulation to every feeling heart. Happiness, comfort, and, to a great extent, *cleanliness* (when compared with the miserable state they were in formerly), are seen and remarked on by every one. The potato-disease was an awful calamity for the time; but we firmly believe that it *was*, and will ultimately be proved to have been, a blessing in disguise.

Croydon, Aug. 23rd.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR AUGUST.

The advices received from most of the continental shipping ports having been important—they having shown a decided tendency to advance, under the influence of large sales for France, Italy, &c.—the state of our own harvest operations has become extremely interesting and important. In the first place, we may observe that the accounts at hand from our leading wheat-growing districts are to the effect that this year's produce will certainly be nearly or quite one-fourth less than in 1852. If we consider that the quantity of land under wheat culture is considerably less than in the average run of years, and that the acreable deficiency is from 2 to 3 bushels, it is clear that a very large import of grain and flour will be absolutely necessary to meet consumption. Under these circumstances, the value of wheat at Mark-lane and elsewhere has been on the advance; and it appears very evident that a further rise will take place in it. Our readers will recollect that we have long since anticipated that France would overship herself; in other words, that adequate care was not taken by the authorities in that country to preserve a sufficient stock of food for consumption. The result is exactly as we predicted. Now that the present year's crop is proving a deficient one, it is discovered that a necessity exists, not only for the almost free admission of the better kinds of food, but for an abolition of tonnage dues on all vessels laden with grain. The purchases of wheat and flour here on French account have been large, and large transactions have taken place in America for shipment to Havre, &c.

From strict inquiries made in various quarters, we learn that the stocks of old wheat in the hands of the farmers are seasonably good, and, for the most part, in saleable condition. In some counties, stocks of the produce of 1851 are yet to be met with. Allowing that the supply is a good one, it must be admitted that both the present stock and the new yield will be far below our requirements. The supplies of barley have long since been nearly exhausted, and those of oats, beans, and peas have become limited in the extreme.

In the early part of the month the cutting of wheat was commenced in the forward counties; and harvest work was pretty general towards the close of the third week. The progress, however, hitherto made has not been large, and, at the time we are writing, extensive tracts of land in Essex and Kent have their wheat uncarted. The scarcity of farm labourers in some quarters has been severely felt, and we apprehend that ere harvest work is concluded many trying difficulties, exclusive of the additional expense in getting home the produce, will have to be encountered. The growth of barley in almost every county is represented as far above an average; indeed, in many quarters, is it considered equal to from 5 to 6 quarters per acre. Should the weather prove fine, the crop will be one of the most valuable ever grown in this country. The yield of oats promises to be tolerably abundant, yet in former years we have seen heavier crops. Both beans and peas have almost wholly escaped the blight, and the produce will no doubt be considerably in excess of last year.

There has been a great abundance of grass in the pastures, and depastured stock has fared extremely well. In some parts a large second-cut has been well secured, and it is stated that it has nearly equalled the first in weight. It is gratifying to learn that the turnip and carrot crops promise well. The quality of those roots is unquestionably good, and very few ravages appear to have been made upon them by fly and other insects. In the early part of the month the hay and straw markets were decidedly active, and prices were conisderably on the advance. In the metropolis prime old meadow hay was worth £5 17s. 6d., and prime old clover £6 per load. These quotations have been pretty well supported; but their tendency of late has been to decline, owing to increased supplies having been brought forward.

The crop of seeds is unquestionably good; but the late heavy rains have retarded the harvesting of them. The samples of rapeseed, canary, &c., shown in some of the large markets, have, however, proved of average quality.

Since the close of the last public sales, a very limited demand has been experienced for both foreign and colonial wool, yet no decline has taken place in the quotations. English qualities have commanded more attention, and prices have advanced 0½d. per lb. Several large parcels have changed hands for shipment to France and Belgium.

In Ireland and Scotland the corn trade has steadily improved, and prices have risen, though not in the same proportion as in England. The cattle trade has ruled very firm on higher terms. The numbers of fat stock forwarded to Liverpool, Smithfield, &c., have not increased. From the

southern and western portions of Ireland our accounts respecting the progress of harvest work, and the yield of the new grain, are very cheering; whilst those in reference to potatoes state that very few traces of disease are to be met with, notwithstanding that the haulm in most quarters has become much decayed. In Scotland the crops in general are looking remarkably well; but as yet harvest work has hardly commenced.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that nearly the whole of the large cattle markets have exhibited considerably increased supplies of each kind of stock, the trade has been decidedly firm during the whole of the month, and prices have ruled comparatively high. It is necessary to observe, however, that both beasts and sheep sold in Smithfield have shown a material falling off in weight and general condition, and that consequently the actual supplies have been by no means first-rate. From abroad the imports have been on a very liberal scale; but we have observed little or no improvement in them—indeed, we may safely venture to assume that nearly three-fourths of the beasts and sheep have been scarcely fit for general consumption. There is one feature amongst them, however, worthy of notice—we mean the excellent manner in which most of the foreign calves "die." Their flesh, in most instances, is nearly equal to that produced in Essex, and finds its way readily amongst first-rate butchers.

From our northern grazing districts, as well as from several other parts of England, we learn that the supplies of stock on most farms are very moderate, the time of year considered; whilst in some quarters great difficulty has been experienced in keeping down the grass. This is to be much regretted; but it has become a serious question with numerous graziers whether the present enormously high prices demanded by the breeders will pay. In all parts of the country lean stock is held at such high rates as to render all prospect of making a profit out of it a most doubtful matter. A further rise in the value of fat stock of from 20 to 25 per cent. would no doubt compensate the graziers; but at present we see no reason to suppose that such an advance will take place. It is true that our artizans and others are fully employed, and that they are in the receipt of higher wages than for a series of years past, but we must take into the account the all-important fact that emigration is rapidly carrying away numerous large consumers and their families, and further, that much higher prices than those now paid will have the effect of checking consumption. Very few cases of disease have been observed amongst the beasts for some time past, and it must e bsatisfactory to know that sheep in general have continued extremely healthy. In all parts their has been an abundance of food of unusually good quality, whilst the demand for cakes has steadily improved, and prices have had an upward tendency. There appears to be no scarcity of stock in Holland; but as yet the Dutch graziers have failed in their attempts to improve their general breeds. The high value of meat throughout France, but more particularly in Paris, renders it probable that shipments of beasts, sheep, and calves will shortly be made to some of the French ports. In that case, a portion of the supplies will be diverted from this country. The following are the imports into London:—

	Head.
Beasts	4,929
Sheep	22,436
Lambs	2,579
Calves	2,908
Pigs	2,055

IMPORTS AT CORRESPONDING PERIODS.

Aug.	Beasts.	Sheep.	Lambs.	Calves.	Pigs.
1847 ..	4,185	18,489	874	1,942	—
1848 ..	2,526	14,266	871	2,135	—
1849 ..	2,913	15,981	1,179	1,000	302
1850 ..	4,277	17,376	2,370	1,945	581
1851 ..	5,342	24,342	4,431	2,569	2,009
1852 ..	5,316	23,623	3,576	2,867	1,856

An arrival of oxen has taken place from Oporto at Southampton and Plymouth, and 100 have arrived direct into the metropolis from that quarter. The total supplies of English and foreign stock shown in Smithfield have been as follows:—

	Head.
Beasts	24,345
Cows	522
Sheep and lambs	172,102
Calves	3,431
Pigs	2,990

STOCK SHOWN AT CORRESPONDING PERIODS.

	1848.	1849.	1850.	1851.	1852.
Beasts ..	17,975	18,133	19,390	20,317	21,049
Sheep and lambs ..	153,280	173,620	181,490	181,900	165,770
Calves ..	3,840	2,480	2,348	2,648	3,350
Pigs	2,443	2,200	2,291	2,732	2,785

The arrivals of beasts from the northern grazing districts has amounted to 8,200 short-horns; from Norfolk, Suffolk, Essex, and Cambridgeshire, 1,450 Scots and short-horns; from other parts of England, 2,200 of various breeds; and from Scotland, 1,110 horned and polled Scots—the remainder of the bullock supply having been derived from abroad and the neighbourhood of London.

Beef has sold at from 3s. to 4s. 6d.; mutton,

3s. 4d. to 5s.; lamb, 4s. 6d. to 6s.; veal, 3s. 4d. to 5s.; pork, 3s. to 4s. per 8lbs. to sink the offals.

COMPARISON OF PRICES.

	Aug., 1849.		Aug., 1850.	
	s. d.	s. d.	s. d.	s. d.
Beef, from	2 8 to	3 10 ..	2 6 to	3 10
Mutton	2 10	4 0 ..	3 2	4 2
Lamb	4 0	5 0 ..	3 6	4 6
Veal	3 0	3 6 ..	3 0	4 0
Pork	3 2	4 0 ..	3 2	4 0

	Aug., 1851.		Aug., 1852.	
	s. d.	s. d.	s. d.	s. d.
Beef	2 4 to	3 6 ..	2 4 to	4 0
Mutton	2 10	3 10 ..	2 6	4 2
Lamb	3 10	4 10 ..	4 0	5 2
Veal	2 4	3 6 ..	2 8	4 0
Pork	2 4	3 8 ..	2 6	3 6

Newgate and Leadenhall have been seasonably well supplied with each kind of meat, which has moved off steadily, as follows:—

Beef from 2s. 10d. to 4s.; mutton, 3s. 4d. to 4s. 10d.; lamb, 4s. 6d. to 5s. 10d.; veal, 3s. 8d. to 4s. 10d.; pork, 3s. to 4s. 4d. per 8lbs., by the carcass.

YORKSHIRE.

The month of August just opened with a succession of almost as uninterrupted fine weather as the days had for the previous month been dark and rainy. The harvest was therefore hastened on; and while on the last week of July there was every probability of a September harvest, the very hot days, and somewhat frosty nights, have made it now general in the last week of August. We waited a while, to have a better opportunity of speaking of the crops when they were actually certain, and in this peculiar year they may all be classed under their separate heads. The first, taking the wheat as the most important for this purpose, is a ridge commencing at or near Doncaster, and extending to Scarborough, comprising the whole of the magnesian limestone, the red sandstone, and the chalk substrata; and whatever influence the northern drift may have which causes these, the whole of the wheats are thin and short in the ear, and will be a very moderate crop, far below an average. Then, if we take the clay valleys, of which Cleveland is a type, there is very little wheat sown at all—a little spring-sown, which is very bad—and these districts will not produce one-third of an average quantity either per farm or per acre. Then taking the waste lands, the alluvial deposits, and the clay loams, the crop is better, but under an average. We heard a land-agent of great experience, on his travels in all parts of this county, observe that he had only seen two really good crops of wheat, and these—one, or both, we forget which—were near Hessle, on the Hull and Selby line of railway. The barley is in greater breadth, and grown indeed on all kinds of land. On those hills where it is usually the best—the strong turnip and barley land—the season has been too hot, and it is light, and has ripened at twice. On soils usually less adapted to barley, it is better, as regards the crop, but of an inferior sample. Oats are a fair crop; and beans promise well. Turnips are growing rapidly, but almost now in want of rain. Pastures and seeds are gone off past recovery, and second crops of red clover, and fog or after-grass, are burned up. The corn markets are at last beginning to be influenced by the prospects, and are all looking upwards.—Aug. 22.

NORTHAMPTONSHIRE.

The weather, up to this date, has been, during the month, very showery. Harvest commenced very generally on the 15th, and in the forward parts of the country a small portion of oats, wheat and barley was carried on the 22nd, since which it has been impossible to make any further progress in carting, and this day has been very wet, with a falling barometer. The wheat on the heavy land shocks up very thin, and has also a small ear. The quality of the corn has improved, and should it be well harvested, will be a fair average sample; but the yield per acre is likely to be deficient. On the dry sound land the crop is much thicker, and the yield will be much better. There is a considerable breadth of barley mown; the swathe is light generally, excepting on the sandy land, where the crop is bulky. Some pieces of early sown oats are carried, but the greater proportion of the oat crop is still in the field. Peas are generally cut, and the beans are improving, but will be a late crop. The corn is generally foul with weeds, and the young clovers are high, so that fine warm weather is very desirable, to prepare the spring crops for the stack. Turnips have been improved by the late rains, and there is an abundance of grass keeping. Fat stock has rather given way in price, but there is a good steady demand. All kinds of store cattle are selling at high prices, and breeding ewes are eagerly sought after, but lambs are rather a dull sale. We have abundance of labour, and have had hundreds of Irishmen seeking employment; but, owing to the small proportion of autumn-sown wheat ready for the sickle, they have not been successful in obtaining employment to any extent, and have now left for other districts. No doubt they were tempted to come over this year from the great demand there has been for agricultural labourers throughout the summer; but it has not been a very successful speculation for them this season. Wool is more inquired after, and several lots have been sold lately, at an advance of from 1s. to 2s. per tod, both mutton and wool bearing a high price, thereby increasing the annual profit of a good flock of sheep.—August 25.

SOUTH LANCASHIRE.

Faithful information is at all times well received by your readers. We have now had four weeks of beautiful weather, which has tended much to the advancement of our several crops. Barley has been cut in most places, and proves itself a good crop. Beans are slightly blighted: we have seen some first-rate crops. Oats are said to be a capital crop, and are mostly finished being cut: we have an unusual breadth sown, and we believe we can boast of a good crop. We should have felt much gratified if we could have given you a similar flattering account as to our deficient wheat crop. Lancashire is, generally speaking, a heavy clay-land, and many farmers were unable, owing to the long continued wet weather, to get in the usual quantity sown at seed-time, and even that which was committed to the ground has had such an unfavourable opportunity, that the yield has proved thin and light-headed. The last few days' fine weather has contributed much to benefit this crop; harvest, indeed, has set in, and a goodly quantity has undergone the usual operation of the sickle, but nothing near the quantity as we have been in the habit of seeing. Potatoes are rotting fast: we should have had an excellent crop but for the early blight. Sad havoc and loss have been created with high markets, and doubtless the prices will yet increase, owing to their "going" so fast, and it is likely enormous prices will be obtained for good potatoes before Christmas. We know several farmers who have purchased large quantities to sell during the winter, if they will keep. Eddish is plentiful; second crops of clover are not so very promising, although some favoured spots happen to be better than in our neighbourhood. Hay maintains its price, in consequence of the short crop, and the bad hay weather at the late hay harvest, and the quantity washed away by the late awful devastating floods, which carried away thousands of tons,

besides other damage; indeed, all our markets have an upward tendency—milk and butter being about our cheapest articles. Garden produce is selling well; and fruit, where there is any, (for in our locality we have none, owing to the chemic vapours, which has almost ruined all our wheat, oats, and barley, during the last six weeks; indeed, we have been all but poisoned thereby). The turnip and mangel wurzel crops are perfect failures. Horses are selling at good figures, as are cows and calves bringing remunerating prices. There is a plenitude of Irish labourers; but they ask and obtain high wages. Other trades are brisk, and everything wears a buoyant sign, and it is our pleasing duty to record contentment and prosperity on all sides.

NORTH OXFORDSHIRE.

We are now so far advanced into harvest as to justify a rough guess as to probable yield and quality. August, as a whole, has been tolerably fine, with, however, a full quantity of moisture. The mercury is now (25th) low, with falling rain, and all harvest-work suspended. Owing to the continued rains of last autumn and early spring, at least one-fourth less than the usual quantity of land was wheat-sown; and from wet and low temperature in June and July, the wheat plant became seriously affected with the yellow grub, with blight, and with mildew; and disastrous will be the consequence. We are now in mid-harvest. The wheat-ear, on being pressed in the hand, feels soft, as if partially thrashed, one row being nearly empty of grain. It was beaten down early, and twisted, so that reaping is tedious and difficult; and as to yield, it will probably fall short one-fourth or one-fifth of an average per acre, which, added to one-fourth less land under wheat, will cause a very serious defalcation. Beans and barley (weather proving favourable) will be heavy crops, and of fine quality. The recent rains have done much for the growing swede and turnips. The potato blight is general, but has lately received a check in its devastations; and, unfortunately, so has the growth of the tubers. They will be very small, and the general yield insignificant. On the valleys and higher meadows, the second crop of grass will be good, and much useful hay will be got together. Prices for all farm produce are remunerative, and we have no murmuring in the streets.

SALTING IN DAMP HAY AND GRASS.

Damp hay, or even grass, may be stacked with layers of straw, or of old hay, sprinkled with salt to prevent heating, and to draw out the juice from the damp grass, which is then absorbed by the straw.

Mouldy hay put together with salt, from 8lbs. to 25lbs. per ton, was better relished by the cattle, and did them more good than sound hay stacked without salt; of which many instances are recorded (Johnson on Salt, p. 105, &c.) An excellent farmer at Landrake, in Cornwall, many years ago, stacked damp hay with salt; which came out almost a paste when the rick was opened, but the cattle devoured it greedily. In Germany they even cure fresh cut grass by pitting with salt, 1lb. to the cwt.; it comes out quite a paste, and is said to go farther (in food) than the same quantity of grass made into hay.

The advantage of dry straw, to absorb the juice drawn out by the salt, is two-fold; first, in preventing the souring of the grass, and, second, in rendering the straw itself nourishing and palatable by the juice thus absorbed.

The proportion of straw may vary from 1-8th to 1-4th, and the salt from 1lb. to 3lb. per cwt., according to the dampness of the new hay. If old dry hay is used instead of straw, it must be in larger proportion, because less absorbent. And where neither can be had, chaff or young furze might do; or even bran, if salted enough to prevent fermentation. — J. PRIDEAUX.

MR. SAMUEL BENNETT, OF BICKERING'S PARK.—The Agricultural World will regret to hear of the death of this truly good man.

CALENDAR OF AGRICULTURE.

In late localities, the harvest will be prolonged into this month, and must be managed as before directed. Cut beans with the hand sickle; tie the crop into sheaves with straw ropes, or of tarred twine; and carry the crop when dry, and build it into ricks, or lodge it in barns. Thatch all ricks quickly; rake the rick-yard clean, and carry the rubbish to the dung yards. Employ plenty of hands in harvest, and reward them liberally.

Gather fruits, as pears and apples. Pick hops, use the haulm for litter, and put the poles under cover for another year. Dry with coke: some use sulphur, to give the hops a yellow tinge.

Plough the wheat fallows, and towards the end of the month begin to sow; finish the laying on of dung and composts; plough leys for wheat, and scuffle the bean and pea grattans as a preparation for wheat sowing. Prepare by fallowing the lands intended to be planted with early spring crops, as potatoes, Swedish turnips, parsnips, and carrots; lay on and cover the dung in drills, or in broadcast; if in drills, it only remains to reverse them in the spring, and plant the crops upon them; if in broadcast, the land will require a ploughing before being drilled. This autumnal preparation both facilitates and expedites the spring operations; but only early climates admit the application of it.

Scarify the surface of lucerne before laying upon it the well-pulverized composts. Spread the dung over the surface very carefully and evenly; bush-harrow it, then roll it heavily in dry weather. Such treatment will secure an early spring vegetation.

Collect manures by every means to the liquid pit and the compost heap. Burn for ashes, and keep them under cover.

Towards the end of the month sow rye for a seed crop, and also for being eaten on the ground in the spring. Sow winter tares mixed with rape, or winter beans, or winter barley, on lands clean and in good heart, or on a partial fallowing with dung.

Scour roadsides; clean out open ditches to be ready for the winter floods; enlarge the courses of brooks. Use all the excavated materials for composts, the very earthy parts to be mixed with lime, and the vegetable for being burned into ashes. Omit no opportunity of collecting manures in any form.

MR. T. B. MORLE'S ANNUAL SALE OF SOUTH DOWNS.—This gentleman's annual sale of South Downs took place at the Malt Shovel on Thursday. The character of the stock will be best judged, when we say that many of the rams sold for £10 and upwards, and that the breeding ewes averaged above two guineas. The sale was well attended, and at its conclusion Mr. Morle entertained a large company at dinner.—*Bridgewater Times.*

REVIEW OF THE CORN TRADE

DURING THE MONTH OF AUGUST.

We have had an eventful month since we last addressed our readers, and the fluctuations which have taken place in prices of wheat have been more important than have occurred in any like period for a long time past. A very large proportion of the rise established in July was lost the first fortnight in August, and something like a panic appeared all at once to have seized on holders. To give any reasonable explanation of this would be difficult; the primary causes were, in the first instance, increased deliveries from the growers—no unusual event just previous to the commencement of harvest—large arrivals from abroad, and last, though not least, a decided improvement in the weather. That this state of things should have had *some* effect was quite natural; but that the *whole* of the circumstances which had led to the previous rise should have, to all appearances, been wholly forgotten, was, to say the least, singular. A few weeks of fine weather in August could not be expected to remedy the evils consequent on an unfavourable seed-time and a cold, wet summer; and we were therefore satisfied that the depression would not continue. This belief has since been fully borne out, and the entire decline has again been recovered. Whether this would, however, have taken place so speedily if our own millers and merchants had been the only purchasers, may be questioned; but the foreign demand for wheat, which greatly assisted to produce the excitement in July, has, within the last fortnight, been renewed with greater vigour than before.

France is evidently in great want of wheat, and after having for several consecutive years furnished Great Britain with a million to a million-and-a-half of sacks of flour, finds herself so bare of stocks as to require to import largely at a time when her own harvest has just been gathered. The weather during the spring and summer was similar in France to that experienced in this country, and the crops suffered from an excess of wet and the want of genial warmth. Until cutting was commenced, the actual extent of the deficiency was not discovered; but as reaping was proceeded with, it was soon ascertained that the yield was exceedingly short. The accounts from some of the southern departments state that the produce of wheat will not much exceed half of an average crop; and though matters are not so bad in the northern parts of the kingdom, still the deficiency is reported to be very serious. Agricultural statistics are collected in that country with care and accuracy by the government; and so soon as it became evident that importations on a large scale would be needed, prohibitory laws were relaxed, and as much encouragement given as possible to importers. The immediate effect of this was a lively demand for wheat and flour on French account in the English markets, and large quantities have been bought to be shipped away. How long this may continue cannot at present be foreseen, but it is quite certain that we shall not receive our accustomed supplies from that country. This alone would, in our present position, suffice to cause a higher range of prices here; but the matter does not end there. The Black Sea supplies will be detained within the Straits of Gibraltar. Marseilles will take a large proportion of the shipments from Odessa, Galatz, &c., that would otherwise have come to Great Britain. In the Italian states the wheat crop has nearly failed, and Indian corn has given a very poor return. The export of grain has been prohibited from thence, and the import duties suspended; hence, a portion of what the Black Sea may have to spare, will be needed to feed the Italians, &c. It follows, therefore, that England will find it difficult to obtain anything like the quantity of bread stuffs from the East she has been receiving for some seasons past.

We must next take a glance at the state of affairs in the north The harvest in the countries bordered by the Baltic is variously spoken of, but none of the advices represent the wheat crop to be large. The only ports in that quarter, at which any stocks of old wheat of importance are held, are Danzig and Stettin, and a considerable portion of the same has already been secured by buyers from France. The new crop will not be available for shipment for some time to come, the usual plan among farmers there being to prepare the land immediately after harvest for autumn sowing, and not to commence thrashing until frost sets in. The only quarter, therefore, from which we can calculate on receiving any supplies of consequence is America, and the capabilities of that country to furnish large quantities of bread stuffs have certainly been overrated.

We have endeavoured in the foregoing remarks to avoid anything like exaggeration, and believe what we have advanced will be found substantially

correct. We must now give our attention to the present prospects for our own crops.

Wheat cutting was partially commenced in some of the earliest districts the first week in August, but comparatively little was done till the 8th., and reaping was not general before the 15th inst. The weather, though at times over-cast and showery, has on the whole been favourable, and the greater part of the grain carried up to this period has been secured in good order. This is very fortunate; and we sincerely hope that the remainder may be as well got in; even with this advantage, the result will, we have reason to believe, be far from satisfactory.

In Essex and Kent, probably the most favoured counties in the kingdom, the yield to the acre is very generally complained of; and as there can be no doubt that the breadth sown was short, the total deficiency threatens to be serious.

Thus far we do not consider ourselves in possession of sufficiently definite data to venture on an opinion respecting the extent of the deficiency, very little having as yet been subjected to the test of threshing. The ears are certainly short, and not free from blight, and the sheaves appear to stand wide from each other on the field. Next month we shall be able to speak with more certainty, but meanwhile we acknowledge we are unable to take a very sanguine view, and fear that the result of the wheat crop will greatly disappoint the growers.

The seeding of the land with Lent corn was accomplished under tolerably favourable circumstances; and a moist season being by no means so detrimental to barley and oats as to wheat, we are inclined to think that those articles will give a relatively better result; indeed we are induced to hope that the superior yield of these, and of beans and peas, may in some measure compensate the farmer for the unsatisfactory yield of wheat.

The potato blight does not appear to spread quite so rapidly as was feared would have been the case; still the disease is very general, and that portion of the crop least infected seems to be wanting in the necessary properties for keeping; many of the potatoes, apparently sound when dug, having been found to decay soon after having been taken from the ground. The loss altogether will be very great; but this will not be felt till later in the year, as the fear in regard to the safety of storing causes large supplies to be forced on the markets.

The rise which has already taken place in the value of wheat is important; but we are of opinion that it has been warranted by circumstances. We used nearly the same words last month, and further said, that though we deemed a temporary calm after so much excitement by no means improbable, we at the same time expressed an opinion that any decline which might take place would be speedily recovered. Our views have not undergone any change, except that we consider the reasons for calculating on a higher range of prices to be stronger now than they were at that time.

We shall now proceed to give a more detailed report of what has taken place at Mark Lane since our last, which will, we think, afford a tolerably good guide for judging of the operations at the other leading markets.

The arrivals of wheat coastwise into the port of London have been on a more liberal scale than earlier in the season; this was more especially the case the first two weeks in the month, upwards of 11,000 qrs. having been received within that period, whilst the weekly arrivals since the 15th has scarcely averaged 3,500 qrs.

The weather having set in fine, there were symptoms of weakness about the wheat trade on the 1st inst., and a decline in prices was only prevented by a large speculator taking off the whole of the Essex supply on that occasion; but the same party being unwilling to continue his operations, prices began to tend downwards before the close of the week, On the following Monday, (the 8th inst.) the downward movement commenced. Factors refused for a time to give way; finding, however, that the town millers were determined not to pay previous rates, they ultimately consented to an abatement of 3s. to 4s. per qr., and even at that decline, the stands were not cleared. The depressions increased during the succeeding week, and on the 15th inst a further reduction of 4s. per qr. took place, without leading to a more active demand. A portion of the Essex wheat had therefore to be landed, and there was a larger accumulation than we remember for some time past. Soon after this, reports of the deficiency in the yield of the new crop began to be received from the districts where cutting had made the most progress; this, and the appearance of some purchasers from France in the market, induced the millers to consider it advisable to buy; and on the 17th about 1s. per qr. of the decline was recovered. Before the end of that week, the whole of the surplus left over from previous arrivals had been placed, and on the 21st. fully 4s. of the fall had been regained. The upward movement has since continued, and we consider quotations higher now than they were at the close of last month. Thus far but little new wheat has appeared; a few small lots were shown on the 8th., principally rubbed-out samples. On the 15th there were several runs from Essex and Kent, amounting together to perhaps 400 to 500 qrs. The condition was generally dry, and the

quality fair. We should estimate the weight at 61 to 62lbs. per bush. The prices realized for red varied from 52s. to 56s., and white from 55s. up to 63s. per qr. On the 29th these rates were exceeded by 4s. per qr. The opening prices last week were, for red 38s. to 44s., and for white 40s. to 50s. per qr.

The supplies of foreign wheat into the port of London have been liberal, a large number of the cargoes from the Black Sea, which had previously arrived off the coast, having been ordered round to the Thames. Altogether, upwards of 100,000 qrs. have come to hand, of which 70,000 qrs. arrived previous to the 15th. During the last week the receipts have been comparatively small, more particularly from the eastward. The decline in the value of foreign wheat was not so great in the early part of the month as the fall on English, and the reaction has been more speedy. Good qualities of Lower Baltic red wheat, were not at any period offered below 55s. per qr. Marianople was, at the period of the greatest depression, held at 50s. to 52s. and fine Polish Odessa, at 48s. to 50s. per qr. The extensive French demand which has been experienced during the past fortnight, has been confined chiefly to red wheat, Danzig having met with comparatively little attention.

It is not easy to estimate what quantity may have been taken off the market, but it is certain that the finer descriptions of red have become very scarce, and even the commoner sorts are now far from plentiful. Pomeranian, Ukermark, and similar sorts weighing 61lbs., could not have been bought this week below 58s. to 64s., and fine Danzig has been taken by our millers at 63s. up to 68s. per qr. These rates are quite equal to those current when we last addressed our readers, so that the temporary fall has been more than recovered.

Besides the purchases made on French account on the spot, an extensive business has been done in floating cargoes. A large proportion of those that have arrived off the coast from Black Sea ports have been bought for France, and at the moment there is hardly any Black Sea wheat afloat undisposed of. The prices last paid have been, for Polish Odessa 48s. to 50s. per qr., cost and freight, and corresponding rates for other descriptions.

Many of the offers from the Baltic, though at higher limits than our merchants and millers have been inclined to pay, have met with takers for the continent, and a large free-on-board business has been done. Lower Baltic red wheat, which might in the beginning of the month have been bought at about 48s. to 49s. per qr. free on board, has lately brought 52s. to 54s., and for moderately good Danzic 54s. to 57s. per qr. has been paid. These rates, with the high freights now current (5s. to 6s. per qr.) will render the cost at the port of destination above what we have of late years been accustomed to.

The millers did not lower the nominal top price of flour whilst wheat was receeding in value; but that they took rather less money than they had previously insisted on, is more than probable. Norfolk households and similar sorts, at all events, gave way fully 2s. per sack during the temporary depression; this decline has however been since recovered, and quotations are now higher than they were before. Within the last week, the town millers have discussed the expediency of putting up the nominal top price, and have decided on raising it to 60s. per sack, making the total advance during the month 10s. per sack.

American flour was rather neglected in the early part of the month, but the reduced state of the stocks rendered holders very averse to making any concession, and really good brands were not at any time offered below 28s per barrel. During the last fortnight a very active export demand has caused a rise of fully 2s. to 4s. per brl., and there is now considerable difficulty in meeting with sweet fresh qualities.

Thus far, very little new barley has been exhibited at Mark-lane, and supplies of old have ceased to come forward for some time past. The want of adequate arrivals has prevented much being done in this grain, and prices cannot be said to have been established for new as yet. The few samples of this year's growth which have been shown have proved of good quality, the berry being well grown and plump, and possessing the requisite kindliness which is needed to make fine malt. No criterion is afforded as to the opening price by the rates paid for the small lots which have been sold, and it will therefore perhaps be better not to give quotations. Foreign barley for grinding has been in good request; moderately good Danish has brought 30s., and fine Pomeranian and Mecklenburg 32s. per qr. A fair business has also been done in Egyptian, Syrian, and similar sorts, at prices ranging from 22s. 6d. up to 25s. per qr., according to quality, weight, and condition.

Stocks of old malt appear to be light, and the export demand for the article having continued, sellers have been enabled to obtain very high prices.

The arrivals of oats from our own coast have been quite trifling, and the receipts from Scotland and Ireland moderate. Having, however, been plentifully supplied with foreign, there has been no scarcity of this grain. A considerable proportion of the arrivals from abroad has consisted of Russian, Swedes, and Danes; and all these sorts receded materially in price during the first fortnight in the

month—Archangels more than any other descriptions. The first cargo which was received from Archangel this season brought 23s. per qr.; on an increase in the supply, the price speedily fell to 20s., and afterwards some forced sales were made at 19s. per qr. The dealers then began to buy freely, and within the last ten days 1s. to 2s. per qr. of the decline has been recovered. The course of prices during the next month or six weeks will depend in a great measure on the extent of the Russian supply. 50,000 to 70,000 qrs. are known to be on passage to London from thence. If this quantity should come to hand all at one time, it might cause a further depression; but on the whole we are inclined to think that Archangels will not again be bought below 20s. per qr. Of English oats, there are none worth naming on the market; and the stocks of Scotch and Irish in granary are small. The fall on the two last-mentioned sorts was 1s. to 1s. 6d. in the beginning of the month, of which decline 1s. per qr. has since been regained.

Beans have come to hand rather sparingly; but the belief that the crop will prove productive, and the quality fine, together with the serious decline in oats, has rendered buyers very cautious, and the value of the article has, notwithstanding the smallness of the supply, rather given way than improved since our last. The transactions in Egyptian beans have not been important, and prices have undergone no change requiring notice.

Very few new peas have as yet been brought forward, and quotations can scarcely be given with accuracy. For a small lot or two of white, 48s. to 50s. per qr. has been paid by the seedsmen; but this affords no criterion of what the splitters may hereafter be inclined to give.

The very alarming reports about the spread of the potato-blight in the early part of the month caused holders of floating cargoes of Indian corn to raise their pretensions, and a few contracts were closed at enhanced terms. Latterly the demand has slackened, which we are inclined to attribute to the fact that the potato-disease has thus far made less progress in Ireland than on this side of the Channel. There are at present very few cargoes arrived off the coast, and the offers of parcels on passage are by no means numerous, the markets in the Mediterranean affording a better prospect of a remunerative return, than those of Great Britain.

Though we have referred to the wants of France, &c., in the commencement of this article, we consider a somewhat more detailed notice of the position of affairs abroad necessary before we close our remarks. To this, therefore, we must devote the remainder of our space.

Whilst the character of the weather has been similar on the Continent to that experienced here, it has not been precisely the same. There has been an excess of rain abroad, as well as at home, but not to the same extent; and we are inclined to believe that the wheat crop will give a better return in Prussia, Russia, Poland, as well as in Pommerania, Mecklenburg, &c., than in Great Britain. At the same time, we do not calculate on a large yield in any part of Europe, and it is quite certain that old stocks have been reduced into a narrow compass in most of the large ports of the Baltic. Meanwhile, it may be regarded as a positive fact, that many of the southern countries have not grown sufficient wheat for their own consumption; and it is therefore tolerably evident that prices abroad would rule higher than in ordinary years, even if England should not require to import more than usual. The probability is, however, that we shall require much larger supplies than are needed in good average seasons; and foreign merchants are quite as well aware of this as we are ourselves. The temporary fall which occurred here in the beginning of the month consequently produced very little effect on the market prices abroad; and the animated accounts of the last few days have raised the expectations of holders on the other side, who have put up their prices fully as much as the advance here has warranted.

The latest advices from Danzig inform us that sellers had refused to take below 58s. per qr., free on board, for fine high-mixed qualities. This had tended to check business; still upwards of 40,000 qrs. have changed hands during the week ending 22nd inst. Harvest was progressing favourably in that neighbourhood.

At Stettin—nearly the only place besides Danzig where stocks of any importance are held—the English advices caused great excitement, and wheat such as might have been bought early in the month at 48s., had risen to 54s. per qr. free on board.

From Rostock we learn that supplies from the growers had ceased to come forward, and that holders of granaried parcels had manifested great indifference about realizing. Many were so sanguine, that they had refused to sell at all.

The reports from most of the other Lower Baltic ports are to nearly the same effect, the rise in the English and French markets having strengthened the opinion previously entertained by holders, viz., that an extraordinary export demand would be sure to be experienced during the ensuing autumn.

At the near ports from which we usually calculate on receiving a portion of our supply, quotations are relatively higher than in the English markets. This is the case at present at Hamburgh, Rotterdam, and Antwerp, buyers on French account having outbid the English purchasers.

The state of France requires some further notice

than we have yet given the matter. It would appear that the wheat harvest there has turned out more deficient than was expected, though a serious deficiency was calculated on. The government having become fully aware of this fact, deemed it prudent to suspend the deferential duties on grain in the first instance. Afterwards the tonnage-dues were removed; indeed, all the encouragement possible has been given to induce imports. These steps would certainly not have been taken if substantial cause had not been discovered for dreading scarcity. All this has failed, however, thus far, to check the rise in prices; and in many parts of France wheat is 8s. to 10s. per qr. higher than in England. Whether the large purchases made here in the Black Sea and in the Baltic will cause the balance of prices to be arranged after a time, remains to be seen; but so long as there is a margin for profit on shipments from this country to France, so long they will be made, though the chances are that we shall hereafter have to pay higher prices than we are now receiving, to buy back what we are at present parting with.

From the Mediterranean no further supplies can be expected to reach us, as all that can be got there is eagerly taken by Marseilles merchants. The high rates of freight will interfere greatly with supplies from the Black Sea ports; and by the most recent advices from Odessa, Galatz, &c., it appears that buyers on French account were paying higher prices than the limits of the English orders had allowed to be given, and that the shipments in progress to Great Britain were consequently on a comparatively limited scale. Under these circumstances, the probable supply which we may reckon to be enabled to obtain from America becomes a matter of great importance. The reports received thus far from that quarter, in regard to the result of the harvest, are not of a very definite character; but we are disposed to think that a good crop has been secured. The stocks of old are also considerable; and provided present prices are maintained, or a further rise takes place, the United States and Canada will no doubt furnish Great Britain with as large a quantity of wheat and flour as we have at any preceding period received from the other side of the Atlantic. But will even this compensate for the total cessation of supplies from France, and the probable decrease in the arrivals from other quarters?

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING AUGUST 20, 1853.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter			
Wheat, Essex and Kent, white	55	to 58	fine up to	66
Ditto ditto new	58	60	fine	68
Ditto ditto red	50	54	55 „	59
Ditto ditto new	55	60	„	63
Norfolk, Lincoln, & Yorksh., red	51	56	„	59
Barley, malting, new	35	38	Chevalier	36 40
Distilling	29	32	Grinding	28 31
Malt, Essex, Norfolk, and Suffolk, new	58	59	extra	62
Ditto ditto old	56	58	„	60
Kingston, Ware, and town made, new	63	64	„	67
Ditto ditto old	61	63	„	65
Oats, English feed	19	22	Potato	21 24
Scotch feed	22	24	Potato	24 25
Irish feed, white	18	20	fine	23
Ditto, black	18	19	fine	22
Rye	34	38	old	— —
Beans, Mazagan	36	37	„	37 38
Ticks	37	39	„	39 41
Harrow	38	40	„	40 42
Pigeon	38	42	„	42 46
Peas, white boilers	40	45	Maple 38 40 Grey	35 38
Flour, town made, per sack of 280 lbs.	—	—	„	55 60
Households, Town 52s. Country	—	—	„	44 50
Norfolk and Suffolk, ex-ship	—	—	„	42 45

FOREIGN GRAIN.

	Shillings per Quarter			
Wheat, Dantzic, mixed	55	to 56	high mixed	60 63 extra 68
Konigsberg	54	55	„	58 60 „ 63
Rostock, new	60	62	fine	63 „ 65
Pomera., Mecklbg., and Uckermk., red	58	59	extra	60
Silesian	„	56	58 white	58 60
Danish and Holstein	„	55	56 „	56 57
Rhine and Belgium	„	—	old	— —
Odessa, St. Petersburg and Riga	50	52	fine	52 54
Barley, grinding	28	32	Distilling	32 34
Malting			none	— —
Oats, Dutch, brew, and Polands	22s., 24s.		Feed	20 22
Danish & Swedish feed	20s. 6d. to 21s 6d.		Stralsund	21 22
Russian	20	21	French	19 21
Beans, Friesland and Holstein				34 37
Konigsberg	36	39	Egyptian	33 35
Peas, feeding	40	42	fine boilers	43 45
Indian Corn, white	32	35	yellow	32 35
Flour, French, per sack (none)	—	—	fine	40 46
American, sour per barrel	26	30	sweet	30 32

IMPERIAL AVERAGES.

For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
July 16, 1853	49	8	28	11	20	11	34	10	40	5	36	8
July 23, 1853	51	10	29	4	21	6	35	3	40	4	37	10
July 30, 1853	52	7	29	7	22	2	36	3	40	5	36	3
Aug. 6, 1853	53	9	29	9	22	6	37	3	40	7	36	10
Aug. 13, 1853	53	3	30	0	22	3	34	9	41	5	36	9
Aug. 20, 1853	51	1	29	7	22	0	34	10	40	11	34	9
Aggregate average of last six weeks	52	0	29	6	21	11	35	6	40	8	36	6
Comparative avge. same time last year	40	4	27	6	19	10	29	7	33	10	31	9
Duties	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Friday's Av. s.	d.	Averages from the corresponding *Gazette* in 1852.	Qrs.	Av. s.	d.
Wheat	76,976	51	1	Wheat	92,576	41	2
Barley	1,896	29	7	Barley	1,762	27	4
Oats	8,271	22	0	Oats	8,215	19	3
Rye	113	34	10	Rye	91	29	4
Beans	3,117	40	11	Beans	2,017	33	2
Peas	476	34	9	Peas	551	29	10

PRICES OF SEEDS.

The unsettled weather lately experienced has naturally given rise to some uneasiness respecting those sorts of seed still in the fields, but as yet very little alteration has taken place in prices. Canary of good quality was held at 50s. per qr. to-day. Winter Tares sold at 6s. 6d. to 7s. 6d. per bushel, and fine new Rapeseed at £28 per last.

BRITISH SEEDS.

Linseed (per qr.).. sowing 54s. to 58s.; crushing 45s. to 50s.
Linseed Cakes (per ton)..... £8 10s. to £10 0s.
Rapeseed (per last)..... £27 to £29
Ditto Cake (per ton)..... £4 15s. to £5 5s.
Cloverseed (per cwt.)..... (nominal) .... 00s. to 00s.
Mustard (per bushel) .... white 7s. to 9s., brown 8s. to 11s.
Coriander (per cwt.)..... old 9s. to 12s.
Canary (per qr.) ..... 44s. to 49s
Tares, Winter 6s. 6d. to 7s. 6d... Spring, per bush., (none)
Carraway (per cwt.)..... ..... 38s. to 40s.
Turnip, white (per bush.)..... Swede (nominal)..... .
Trefoil (per cwt.) ..... 17s. to 21s.
Cow Grass (per qr.)..... (nominal) .. 00s. to 00s.

FOREIGN SEEDS, &c.

Linseed (per qr.).... Baltic, 43s. to 46s.; Odessa, 45s. to 49s.
Linseed Cake (per ton)..... £8 0s. to £10 0s.
Rape Cake (per ton)..... £4 15s. to £5 0s.
Hempseed, small, (per qr.) 33s. to 35s., Do. Dutch, 37s. to 38s.
Tares (per qr.) .... old, small 30s. to 36s., large 36s. to 42s.
Rye Grass (per qr.) ..... 28s. to 35s.
Coriander (per cwt,)..... 10s. to 12s.
Clover, red (duty 5s. per cwt.) ..... (nominal).. 00s. to 00s.
Ditto, white (duty 5s. per cwt.) .... (nominal).. 00s. to 00s.

The demand for Linseed has been less active, yet prices have been fairly supported. Good Petersburgh has sold at 43s., East India 49s., and Calcutta, ex ship, 48s. 6d. per qr. Floating cargoes of the latter are held at 49s. Rape scarce, at 50s. for East India. Cakes are very firm, and the turn higher.

POTATO MARKET.

BOROUGH AND SPITALFIELDS.

During the week, very extensive supplies of English Potatoes, in good saleable condition, have been on offer in these markets. The demand has continued steady, and prices have been well supported. Shaws, 75s. to 90s.; Regents, 95s. to 120s. per ton. Scarcely any imports have taken place from abroad, but two boxes have come to hand from Cadiz.

COUNTRY POTATO MARKETS.—York, August 27.—A large supply of new potatoes of good quality, sold at from 1s. 10d. to 2s. 2d. per bush. Leeds, August 23.—We had a fair supply of potatoes, which were sold wholesale at 10d. to 11d. per score of 21lbs., and retail, 5lbs. for 3½d. Richmond, August 20.—New potatoes, 6d. to 8d. per stone. Sheffield August 23.—New potatoes sold at from 8s. to 10s. per load of 18 stones. Manchester, August 23.—New potatoes sold at from 8s. 6d. to 12s. per 252 lbs.

PRICES OF BUTTER, CHEESE, HAMS, &c.

	s.	s.		s.	s.
Butter, per cwt.			*Cheese, per cwt. Cheshire*	68	86
Friesland	92	94	*Cheddar*	64	80
Kiel.....	88	92	*Double Gloucester*	62	68
Dorset.....*new*	94	100	*Single do.* ..	60	70
Carlow..... ,,	90	94	*Hams, York, new*	80	90
Waterford .. ,,	90	94	*Westmoreland*...	76	86
Cork..... ,,	84	90	*Irish*	66	74
Limerick .... ,,	82	88	*Bacon, Wiltshire, green*	68	71
Sligo..... ,,	86	90	*Waterford*	65	67
Fresh, per doz. 11s. 0d.	12s. 0d.				

ENGLISH BUTTER MARKET.

August 29.

We note an inactive state of trade, and to effect sales lower prices must be taken.

Dorset, fine weekly ..... 96s. *to* 98s. *per cwt.*
Do., middling ..... 88s. *to* 92s. ,,
Devon ..... 92s. *to* 94s. ,,
Fresh, per dozen lbs...... 9s. *to* 11s.

WOOL MARKETS.

BRITISH WOOL TRADE.

LONDON, Monday, August 29.—No further advance has been realized for any kind of English wool; yet several holders refuse to sell at present rates. The stocks here are trifling, and the supplies in the hands of the growers are represented as comparatively small. Several parcels have changed hands on continental account.

Current Prices.

	s.	d.		s.	d.
South Down Hoggets	1	4	*to*	1	6½
Half-bred ditto	1	4	—	1	6
Ewes, clothing.....	1	2	—	1	3½
Kent fleeces.....	1	1½	—	1	3
Combing skins.....	1	1	—	1	5
Flannel wool	1	0	—	1	5
Blanket wool	0	8	—	1	0½
Leicester fleeces.....	1	2½	—	1	4

LIVERPOOL WOOL MARKET, Aug. 27.

Scotch Wool.—There continues a fair demand for laid highland wool on arrival, at fully late rates. White highland is much wanted: the supply limited. The demand for all kinds of good crossed and cheviots is fair, and at full rates.

		s.	d.	s	d.
Laid Highland Wool, per 24lbs....		13	6 *to*	14	0
White Highland do.....		17	0	18	0
Laid Crossed	*do..unwashed*	18	0	19	0
Do.	*do..washed*	19	0	21	0
Laid Cheviot	*do..unwashed*	20	0	22	0
Do.	*do..washed*	24	6	26	0
White Cheviot	*do .. .. do*	28	0	32	0

HIDE AND SKIN MARKETS.

Saturday, Aug 27.

The supplie sof hides and skins on offer this week have been extensive; yet the demand has ruled steady, and prices have had an upward tendency.

			s.	d.	s.	d.	
Market Hides, 56 *to* 64 *lbs*.....			0	0	*to* 0	3	*per lb.*
Do.	64	72 *lbs*.....	0	3	0	3¼	,,
Do.	72	80 *lbs*.....	0	3¼	0	3½	,,
Do.	80	88 *lbs*.....	0	3½	0	4	,,
Do.	88	96 *lbs*.....	0	4	0	4½	,,
Horse Hides.....			0	0	6	6	*each.*
Calf Skins, light			1	0	3	0	,,
Do. full			6	6	0	0	,,
Downs			2	10	3	2	,,
Polled Sheep.....			3	6	4	0	,,
Lambs			2	9	4	2	,,

MANURES.

London, August 29.

Linseed Cakes are firm, with an upward tendency and active demand, which is likely to exceed the supply.

Rape Cakes scarce, and wanted.

PRICES CURRENT OF GUANO.						
Peruvian Guano ..... *per ton*	£9	5	0 *to*	£9	10	0
,, *D. first class (damaged)*.. ,,	8	10	0	0	0	0
Bolivian Guano ..... ,,	7	5	0	7	10	0
ARTIFICIAL MANURES, OIL CAKES, &c.						
Peat Charcoal ..... ,,	2	15	0	0	0	0
Nitrate Soda ..... ,,	17	10	0	18	0	0
Nitrate Potash or Saltpetre..... ,,	26	0	0	28	0	0
Sulphate Ammonia ..... ,,	15	0	0	16	0	0
Muriate ditto ..... ,,	22	0	0	23	0	0
Superphosphate of Lime ..... ,,	0	0	0	6	0	0
Soda, Ash or Alkali..... ,,	0	0	0	8	0	0
Gypsum ..... ,,	1	10	0	1	15	0
Coprolite..... ,,	3	0	0	3	10	0
Sulphate of Copper, or Roman Vitriol for Wheat steeping.... ,,	33	0	0	38	0	0
Salt ..... ,,	1	1	0	1	5	0
Bones ½ inch..... *per qr.*	0	0	0	0	15	0
,, *Dust*..... ,,	0	0	0	0	17	0
Oil Vitriol, concentrated ..... *per lb.*	0	0	1	0	0	0
,, *Brown*..... ,,	0	0	0	0	0	0¾
Rape Cakes..... *per ton*	5	10	0	5	15	0
Linseed Cakes—						
Thin American in brls. or bags ,,	10	0	0	10	15	0
Thick ditto round.... *to arrive* ,,	8	15	0	0	0	0
Marseilles ..... ,,	9	0	0	9	10	0
English..... ,,	9	10	0	9	15	0

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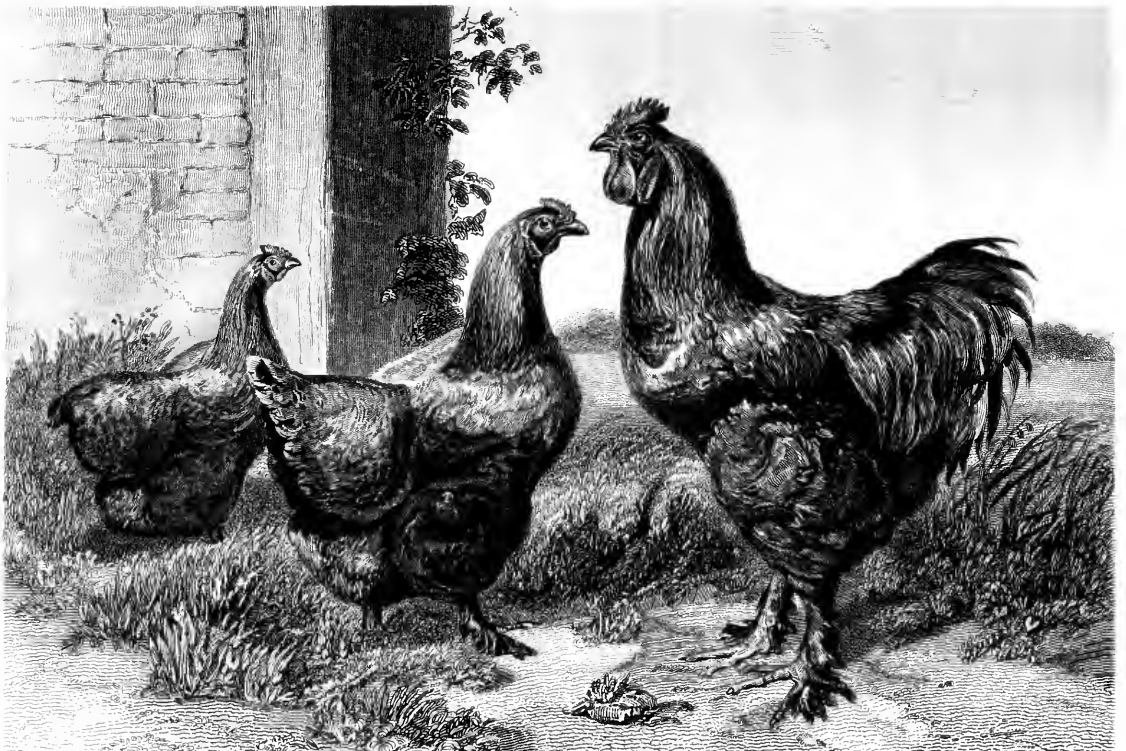

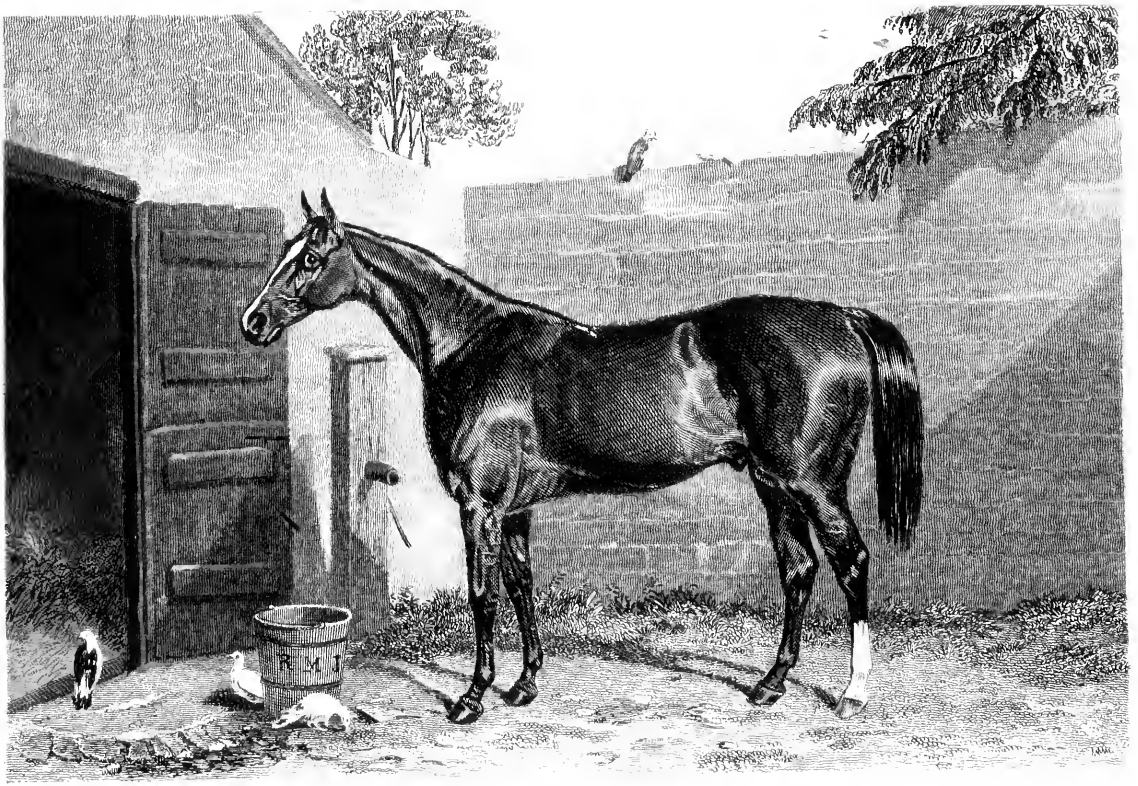
R M J

THE FARMER'S MAGAZINE.

OCTOBER, 1853.

PLATE I.

COCHIN CHINA FOWLS (BLACKS).

THE PROPERTY OF J. FAIRLIE, ESQ., OF CHEVELY PARK, NEWMARKET,

This set of prize birds are known—the cock as "Victor," and the hens as "Nelly" and "Polly."

They took the first prize at the Great Metropolitan Show ..... January, 1853.
The first prize and silver cup at the Cheltenham Show ..... June, 1853.
The first prize at the Swaffham Show ..... June, 1853.
The first prize at the Farningham Show ..... June, 1853.

Another cock, called Hero, was then substituted for Victor, which was in full moult, and as thus exhibited—

They took the first prize at Great Yarmouth, and the first prize at the Show held in the Surrey Zoological Gardens.

The couple of hens are thought by many to be the two best ever exhibited; as their success certainly warrants this high character. Their chief points of excellence are—greatness of weight, shortness of leg, breadth of back, and quality of the fluff, which resembles the softest down. They are, moreover, capital layers.

These three birds, with a number of Mr. Fairlie's chickens, will be sold by auction by Mr. Stevens of Covent Garden, on the 11th of October.

PLATE II.

IRISH BIRDCATCHER.

BRED BY MESSRS. HUNTER AND KNOX, OF KILDARE, IN 1833.

Irish Birdcatcher is by Sir Hercules, out of Guiccioli, by Bob Booty, her dam Flight, by Escape (Irish), out of Young Heroine, by Bagot.

He is a dark-chesnut horse, with white ticks running all over him. He stands as near as possible sixteen hands high; has rather a plain head, with a Roman nose, small ears, and not particularly good eye. He has a strong neck, fine shoulder, and good depth of girth; he has not very large arms, but fair-sized bone, with good back, barrel, and quarters. His thighs and hocks, however, are straightish; the latter, indeed, bad and curby looking, a failing in which some of his stock resemble him. Birdcatcher has a blaze of white in his forehead, and one white leg behind.

Irish Birdcatcher came over in 1846, and stood that season at Messrs. Barrow's Paddocks, Newmarket, to which he returned for one more season in 1851. In 1847 and 1850 he was with his owner in Ireland; the remainder of his time has been passed with R. M. Jaques, Esq., at Easby Abbey, near Richmond, Yorkshire.

Birdcatcher's stock speak for themselves; they are generally considered to possess in a very eminent degree those two grand qualifications for a thorough-bred horse, speed and stoutness. They are often perhaps more useful than "good-looking," and have not always the evenest of temper; but they are a sound hardy sort, equal to run in any company and over any ground. Public performance declares them amongst the best we have; and by the same high authority their sire Birdcatcher as *the* best stallion of the day.

THE ADULTERATION OF MANURES.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

The adulteration of manures by low and unprincipled dealers is practised to such an extent, that the farmer can hardly be too much upon his guard, or too frequently warned of the danger he runs in purchasing of unknown and untried dealers. The subject was recently alluded to by a correspondent in a contemporary, when describing the formation of an agricultural chemical association by the landowners and occupiers in the neighbourhood of Tamworth and Lichfield; he tells us that "feeling convinced that the most extensive frauds were carried on, and that not merely by small dealers, but by extensive manure manufacturers, it was thought useless to deal with merely isolated cases of fraud. A meeting was therefore called of the principal landed proprietors and farmers of the district, and a society was formed, the object of which is to enable the farmers to submit every specimen of artificial manure presented to them for purchase to the test of a rigid chemical analysis, and so to ascertain its real market value.

"It is due to Sir Robert Peel to say that he has assisted in the establishment of the society with characteristic energy, and has agreed to give the sum of £50 yearly for three years, when we have reason to believe that it will be firmly established. This handsome subscription, together with what other landowners have promised, and a sovereign a year from each farmer, enabled the committee to engage Mr. James Haywood, of Sheffield, as their analytical chemist, and he has now for some months past been actively engaged in the analysis of manures, soils, &c., and in the inspection of the farms of the members.

"The result of his labours hitherto has been to reveal a frightful amount of fraud on the part of manure manufacturers, greater than could possibly have been conceived by those unacquainted with the subject, and also proving that those who, from their position, might have been supposed above the temptation of unfair dealing, are some of them as much involved in disgrace as their more humble rivals."

The subject becomes of more importance because of the increasing extent to which artificial manures are used. Every season, in fact, adds to the conviction of the farmer, that, whatever may be the extent of the supply of his farm-yard manure, yet still that it is a profitable practice to use in addition, either superphosphate of lime or Peruvian guano, or other artificial manure. As then the demands of the farmer are enlarged, contrivance and ingenuity are excited in all directions to tempt him with low-priced varieties of different manures; and the greater the inferiority of the article, the more adulterated the specimen, the cheaper, as a matter of course, the dealer can afford to sell it. It is sometimes in vain that the farmer seeks to avoid these frauds, by preparing a manure himself; even then his danger of adulteration is not avoided. Take, for instance, the superphosphate of lime, and follow a farmer in his efforts to make it himself, and see what risks he runs. The bones he uses he must buy *whole*, and crush them himself; if he purchases *crushed* bones, why then there are all sorts of matters with which these are adulterated—for instance, gypsum, spar, oyster-shells, &c.: then again, his sulphuric acid should be analyzed before he uses it; for otherwise he runs the great risk of its specific gravity being brought up by the addition of Glauber salt—a substance utterly worthless for his purpose. A large public company, to whom I have long been counsel, have been compelled, in their own defence, to manufacture their own sulphuric acid, from the constant frauds in this respect to which they were exposed.

Even if the farmer takes care to have the manure he proposes to purchase analyzed, still considerable precaution is necessary: he must see, first, that the sample is taken from the bulk; and secondly, that he has delivered to him the same manure that he had analyzed; the analysis frequently also produced before intended purchasers by the dealers, should be regarded with much suspicion; for, as Professor Anderson remarks (*Trans. High. Soc.*, 1853, p. 463)—"One anlaysis is sometimes made to do duty for several cargoes; and," adds the Professor, "what is still more strange, analyses are sometimes obtained by dealers in adulterated guano, which, I suspect, are made up to sell it, although they show it to be of unfair quality. It may at first sight seem altogether contradictory that the very means of detection should be thus employed; but I believe that, even at the present day, many persons are unacquainted with what the composition of genuine samples of the different sorts of guano ought to be, and that the adulterators, presuming upon this, produce analyses which they would not venture to do if they knew that the purchasers were better informed. A case occurred to me some time since, in which I suspect

that my analyses were thus employed. I received a sample of guano, which on analysis proved to contain 7 or 8 per cent. of sand and about 12 or 14 of gypsum, and which I accordingly reported to be an adulterated Peruvian. Soon after, I received from the same person two other samples, both of which were very similar to the first, and on them I gave a similar report. After a little while, I got some more samples, all adulterated, and which I again reported to be similar to those before analyzed. At first I was inclined to pity the unfortunate individual into whose hands so many adulterated guanoes had fallen. By and by, however, I began to be a little suspicious; but the whole thing did not come out until I got another sample, which contained between 30 and 40 per cent. of sand, and which I reported to be more disgracefully adulterated than any of the others. It then turned out that the individual who sent all these samples was an adulterator, and that he had bought 500 tons of the guano which he had last sent me for the purpose of adulterating it; but he had got it from some knowing hand, who, thinking, I suppose, that there was no reason why he should not make the profit, had adulterated it before sending it off. I have little doubt that the analyses which were obtained from me were employed in some way or other to sell the adulterated guano, and as any one at all acquainted with the composition of guano must have seen at once that they were analyses of adulterated samples, the only way in which it could have been done must have been by producing them only to persons who were not likely to discover by inspection that they could not be genuine, and leading them to suppose, that the mere fact of their having been analysed by a person of credit was a sufficient guarantee that all was right."

The cool way in which these dealers describe their fraudulent doings is most amusing. An account was given some time since in the *Gardeners' Chronicle*, of a conversation which took place in a public carriage, between one of these gentry and his friend, in which he described the value of the Epping, guano resembling earth, found on Lord Mornington's estate, which he mixed copiously with the Peruvian guano: "My guano," he added, "was, in fact, better than the Peruvian, for it never burnt up the farmers' crops."

Indeed, as I have in another place (*Fertilizers* p. 463) had occasion to remark, the adulteration of manures is a subject which can hardly be too often and too constantly regarded, since the fraud thus committed by the dealer is not only injurious to, nay, a robbery committed upon the purchaser, but it produces still more generally injurious effects, since it leads to deceptive results and erroneous conclusions. For if the farmer tries an experiment, for instance, with what he purchased, and still believes to be, cubic petre (nitrate of soda), when in reality the salts he has purchased are three-fourths composed of Glauber salt (sulphate of soda), he has not only been robbed by the fraudulent dealers of his money, but he has been still more deeply injured by the failure of his trial leading him out of the true path of knowledge, and thus depriving him of a permanent advantage to which he was justly entitled from a well-considered and sagacious course of reasoning. Deceived in his chemical agents, he is convinced of the correctness of his own merely, in fact, *intended* experiment. Of what use, indeed, are all those careful considerations, as to the possibility of profitably supplying to a barren or a poor soil the constituents of plants in the way so well and so practically adopted by the Rev. A. Huxtable, if its possessor cannot safely obtain the unadulterated manures in which those ingredients abound? Take, for example, the manure superphosphate of lime, and remark the adulteration, recorded to have been detected, and publicly announced by Mr. Pusey (*Mark Lane Express*). In this instance, some superphosphate of lime, sold to the public at a high price as genuine superphosphate of lime, upon being analyzed, was found to contain in 100 parts—

Superphosphate of lime	14
Sulphate of lime (gypsum), being worth about 30s. a ton	64
Water	20
Residue	2

Then again, in the case of crushed bones, the fraudulent persons to whom we have been alluding adulterate them with crushed oyster shells, Derbyshire spar, the refuse lime of the curriers, and other worthless articles; in fact, it is as needless as the task is disgusting, to enlarge the list of such frauds.

Let the farmer, then, beware of these frauds: let him avoid, as he would an infected animal, all manure-dealers of whose respectability he is not well assured.

Glauber salt (*sulphate of soda*) is, from its cheapness (6s. per cwt.), the saline substance very often employed by the fradulent dealer, for the adulteration of the more valuable salts used as fertilizers. The boldness of the size of the crystals of Glauber salt materially facilitates this process of adulteration (and they are readily reduced in size, according to the requirement of the contemplated fraud).

And when the farmer reflects that sulphate of ammonia is worth about 17s. per cwt., carbonate of ammonia 56s., muriate of ammonia (*sal ammoniac*) 20s., nitrate of soda (cubic petre) about 17s., saltpetre (nitrate of potash) about 24s., he will see how great is the temptation for the fraudulent dealer to partially substitute for these a salt like sulphate of soda, which is procurable in abundance for about 6s. per cwt.—an adulteration, too, which only a chemical analysis can detect. I had a curious instance of this adulteration communicated to me only a few days since, in which the buyer of some sulphate of ammonia purchased it in two lots, one of a house who deservedly ranks at the head of the manure trade, and the other of a small profligate dealer, who did not charge so much by several shillings per cwt. as the other dealer did. The purchaser suspecting some foul play, fortunately succeeded, after much trouble, in tracing both lots of sulphate of ammonia to the *same chemical manufacturer*, who, upon being applied to, had the courage to explain to the merchant the difference in the price. "The sulphate of ammonia you procured, sir, of the —— was sure to be sulphate of ammonia, for they do not adulterate, and they could not sell it to you for less than they did; but that which you bought of Mr. —— was also made by us, but by his express order mixed with one-fourth of Glauber salt."

There is only one safe way for the farmer in this respect—he must carefully avoid all inferior cheap specimens and little dealers in this valuable manure. If, indeed, he wishes for a less powerful or less concentrated fertilizer, let him procure the best guano, and *lower* it himself, on his own farm, by mixing it with finely-sifted peat-ashes or mould. He will then not only save in the carriage of his purchase, but be certain that he has a certain amount of valuable manure in his possession.

The great protection, however, to the farmer is, as Professor Anderson well concludes, to deal with persons of credit; and it fortunately happens that there is no want both of dealers and of manufacturers who do their best to supply the farmer with genuine articles. These individuals are put at a great disadvantage by the fraudulent dealer, who for the same price produces an article which is in reality of comparatively little value, but which of course he recommends in the most unscrupulous manner, and probably manages to sell more successfully than the fair dealer. If we add to the precaution of carefully inquiring into the character of the merchant, and the sources from which he derives his supply, the security of analysis, I am convinced that there would be but little adulteration; but so long as persons continue unhesitatingly to buy anything that is offered them as manure, I do not see how we are to do any good. I know well that the fair dealers are most anxious to second the attempts of the farmers to protect themselves against fraud, and it is surely worth every effort on the part of those who are expending large sums in the purchase of manures to do so. Let my readers then attend to these good suggestions, and let them remember that under judicious management, to add manure to the farm is the same thing as to add corn to the granary; and the hour is now, I trust, forever past when the skilful English farmer deemed it almost useless to produce corn at the then non-remunerating prices.

CULTIVATION OF CHICORY.

Amongst the crops grown in some localities, and altogether unknown in others, is the plant chicory. We have been several times asked about its cultivation—partially, perhaps, with a view to grow it as a change or novelty crop; but the ordinary growers are so jealous of its cultivation extending, that they have not given much information on the subject; and there are few if any, nay, we may say there is no agricultural work whatever, which gives the details of the cultivation of this plant to any considerable degree.

We may mention that it is used both as an article of commerce and as a field or forage crop; and the objections raised against it, so as to exclude it from most of the farms where there seems to be any danger of having it cultivated, are perhaps as much on the ground of its being difficult to eradicate, as from any great degree of injury it is likely to inflict on the soil. Some, indeed, object to any root being sold off, and hence restrict the cultivation of potatoes. Nor do we think the chicory any more exhausting than the latter crop. But the real pith of the question is, that manure is used to one and both of the plants which rear them, and the produce being sold off is equivalent to the removal of so much manure from the farm.

There are cases, however, where it may be grown to advantage. We have a friend who is an excellent farmer, who never grows an exhausting crop for the sake of it, and who has grown chicory on some light land instead of the turnip crop, to remove the latter from its like, because the field was subject to the finger-and-toes when in turnips; thus removing the turnip from its like, introducing an-

other crop, and enabling the land to regain the fertility which it had lost by the growth of half or quarter crops of turnips. It is true, potatoes interwoven with the rotation would have had an effect precisely similar, and there would have been less difficulty in the eradication than there could be with the chicory; but as a matter of convenience he preferred the latter, which could be dried and conveyed away at much less trouble than the bulky potato, which requires a railway station near to get them to the great towns, or a navigable river to enable the farmer to repay the cost of transit.

The land for chicory requires deep cultivation the autumn before it is sown. A deep ploughing, or what is better a digging, being the best preparation for the crop. It is by far the best also, if possible, to add the manure to the soil at this period, and work it well into the land, so as to get it thoroughly incorporated before the last ploughing up is given; and it is best to harrow the land for the winter, if, as is usual, the soil be pretty dry and porous. The seed of the chicory lies some time in the ground, and it is by far the best to allow the land to lie still with a fine surface, to stimulate the seeds of weeds to germinate, so as to have less liability to do so when the seeds are sown.

The seed is usually sown in the second week of May; though in the southern parts of the island, say south of the Trent, it may be desirable to defer the sowing a week or ten days later. The soil should be ridged up, so as to deepen it, and facilitate subsequent hoeing, and the seed be sown at the rate of 3½ to 4 lbs. per acre in drills, the same as swede turnips, and should be 12 to 14 inches apart. The plants will make their appearance in the month of June, sometimes about the middle and sometimes towards the end; and care must be taken if sown in a dry spring and rain should soon follow, as it may be necessary to horse-hoe the land between the drills, or even to hand-hoe the whole of the ground to keep down the weeds, for these are both very injurious to the crop, as well as costly and troublesome if they once get the upper hand. Some parties thin the plants after they are up, and certainly a better root is thereby established; others, who sow less seed, will allow them to grow as they come up, depending on the side space for their extension; but the thinning is decidedly preferable, and the distance should be not more in any case than five or six inches, as it is loss to increase it beyond that amount. The summer cultivation consists in careful hand-hoeing; and he who regards his land will not only hoe between the rows, but between each plant.

Late in October the raising of the roots is commenced; and it is best accomplished by a long three-pronged fork. Some farmers have the leaves removed before the roots are lifted, and carried for sheep, which eat them with avidity. The usual yield of chicory is from twelve to fifteen tons per acre, and this is sold at prices varying from a gross amount of £12 to £30; so great will be the gross proceeds of an acre according to the price of an article which fluctuates, perhaps, beyond any other produced by the farmer. When taken up, they are topped and tailed, then washed, and cut into slices like turnips, only in lengths as equal as possible. This dries, in the whole of the fifteen tons, to about one and a-half, and so the root is much more portable than the potato.

The composition of chicory, both in the sense of food and also in that which it removes from the land, has recently been ascertained by Dr. Anderson. He gives it as below:—

Water	18.01
Ash	3.64
Nitrogen	1.60

The ash has the following constituents:—

Silica	3.790
Peroxide of iron	0.657
Lime	8.644
Magnesia	5.777
Sulphuric acid	13.048
Phosphoric acid	13.882
Potash	29.687
Soda	7.641
Chloride of sodium	2.555
Sand	3.271
Charcoal	2.567
Carbonic acid	7.927
	99.426

But it seems the plant has great powers of appropriation, or replacement of constituents; for another specimen gave very different results, as much as 20 per cent. more potash being found in one than in the other sample. It is just possible the plant is able to replace the potash with soda.

The effect on the soil is twofold: if properly cleaned, it obtains a sort of half fallow; while the chicory being a deep feeder, a corn crop will often follow it with advantage, the latter having its roots only on the surface (especially barley), which has been well worked. But the crop is sure to be full of the chicory; and it being an indigenous plant and difficult to exterminate, it will often remain troublesome for years in the soil—flowering after the barley or wheat, and so exhausting the soil. Nor is there any remedy for this. The most careful grubbing will never entirely eradicate it from the soil; for if the least tendril of the root be left, it will grow, and make its appearance the following spring.

We know a Farmer who cultivates large quantities of chicory, who always grows turnips on the land after that plant. The spring ploughings enable him to clear off a considerable portion of the roots, and the hoe does the rest, for few plants can bear

the continual removal of the leaves. Still it is not totally eradicated, and it remains more or less in all his farm as a weed.

Where the chicory is sown as a crop for the purpose of change, we would recommend that the land, as soon as the crop is removed, should be ploughed up, and next spring sown with 4lbs. of chicory broadcast, so as to become a sheep pasture. This will rest the land from seeds and from corn, and it may remain four or five years under chicory, and then the plant will, having consumed its peculiar food, show some disposition to die out. Break up and fallow at Midsummer in the fourth, fifth, or sixth year, when this tendency shows itself, and thus a profitable use may be made of the land, and the plant eradicated without difficulty.

THE IN-GATHERING.

The "in-gathering" of corn crops has in all ages been regarded as a work of no ordinary interest, not merely by the husbandman himself, but by the whole inhabitants of the land. In oriental climes, princes and their nobles never failed to countenance it; and also the Gods, if we can believe the bards of ancient times. Among the Jews, it occupied a very prominent place. In the fine climate of Palestine, the operations of harvest, including thrashing, were but of short duration. The corn was tied up in sheaves, and shocked, as now with us, and was soon fit for the thrashing floor. When thrashed, the clean corn was stored in the tent, as in the case of Abraham, or in houses or granaries, as in that of Boaz, and ground in hand-mills or querns by the women, as required for family use; and the straw stored as provender for cattle. They (the Jews) were commanded to "bring a sheaf of the first-fruits of the harvest to the priest," when it commenced, and to celebrate its conclusion by a feast. The sheaves were carried to the thrashing-floor in carts drawn by oxen; and if one sheaf was left in the field, it belonged to the gleaners—rites which mark with peculiar solemnity and respect the work of in gathering

In some parts of America, Africa, Australia, and the continent of Europe, the climate, generally speaking, is as dry as in Palestine; and hence the operations of harvest are concluded with equal dispatch. But in Russia, Norway, Sweden, &c., where the climate is less propitious, it is very different; for there the securing of the crops from the rigours of winter, which frequently overtake them before properly ripened, becomes a more protracted and arduous undertaking, the sheaves requiring at times to be kiln-dried. In some parts, the work is attended with an amount of labour and expense of which it is hardly possible to form a just conception, partly from the rudeness of their implements, as well as the inclemency of the weather; and when we further look at the Baltic and Black Sea prices, the surprise is, how the farmers of those countries can perform the work—thrash and cart their corn hundreds of miles over impassable roads—for the money, and have anything at all left to themselves.

In Britain, the mode of in-gathering is perhaps more diversified than in any other kingdom of the world, partly from the diversity of climate, and partly from the little progress some provinces have made in the march of improvement. The climate of the southern provinces of England, for instance, is very different from that of the Hebrides, and the work of in-gathering equally different: for in the former, the crop is sometimes secured in the stack-yard, without having experienced a single shower after being cut; while in the latter the day seldom dawns during which rain does not fall, and in such abundance, at times, that the sheaves have to be dried on upright poles, or horizontal bars of wood, trees, and such-like contrivances, as in Russia. Since the introduction of thorough draining, the seed has been got earlier into the ground, and the harvest advanced a stage also, greatly in favour of all the operations of harvest. Still, the work of in-gathering is a trying one to the Hebridean farmer; and in many of the northern provinces of the United Kingdom and of Ireland, farmers often experience it little better. In Ireland, although the climate is more favourable for the growth and ripening of crops, it is, nevertheless, more moist and warm—circumstances greatly against the drying and stacking of the sheaves. In many cases the oat is the only corn crop grown; and before it is secured, the colour is injured, requiring kiln-drying with sulphur, &c., to fit it for the London and Liverpool markets. In the late districts of Scotland, the weather, although wet, is more cold, and, instead of muggy nights, "black, frosty winds," "rustle up the sheaves," giving rise to early and busy mornings. In those districts, the drying of the sheaves for the stack-yard is more dependent upon cold, drying winds, than the heat of the sun, and not unfrequently the keeping of them afterwards; for, if close, misty, and warm weather succeeds the stacking, considerable damage is sometimes sustained to the quality of both corn and straw, the stacks requiring not unfrequently to be turned—a work equally hated in the north as in the south. In bad seasons—and indeed in the generality—the quality of the crop depends as much upon the weather after stacking as before it. The common maxim, never to stack corn until it will keep in any weather, cannot at all times be safely reduced to practice in many of the districts in question, and hardly in any district in bad seasons; for when the weather is precarious, the sheaves must be carried as soon as they will keep under ordinary circumstances—hence the consequences, when the barometer falls lower. If the weather after harvest is better than ordinary, the sample may thrash out as fresh and clear as if stacked in better condition; but

if worse, many stacks make bad meal and horse-corn, rendering it difficult sometimes to secure from among them a sufficiency of sound seed for the ensuing crop.

In some of our worst climates, more ingenuity is called into operation in the stacking of corn, to preserve it, than in some of the best, the former affording more useful information to the latter, than the latter to the former, especially in seasons like the present. The truth of the old saying, that "necessity is the mother of invention," is practically realized; for there, farmers often contrive to thrash out better-kept samples than their southern neighbours, more fortunately situated as to climate. We shall endeavour very briefly to throw out a few observations on some of those contrivances.

The first, and perhaps the most important is, *an airy stack-yard*—plenty of room between the stacks to allow of the wind circulating freely among them. If stacks are crowded together so closely that one can hardly walk between them, as is sometimes the case, and surrounded with a close hedge, wood, or wall, it is scarcely possible at times to prevent them heating, let the other contrivances be what they may. When such is the case, not a "breath of air," quoting rural phraseology, "is to be felt in them." When heating takes place, the atmosphere is so confined that it soon becomes loaded with the gases given off in the process; causing a smell to be transmitted to a considerable distance. In short, the stack-yard is fast undergoing a process of slow combustion; and consequently is enveloped in a cloud of smoke, visible as far as the eye can see across the horizon on a frosty morning. If properly ventilated, a single night's frosty drying wind, rustling among the stacks, will often subdue the process of heating even where it has made some considerable progress. The situation of the stack-yard, therefore, and the planning of the corn-stands, so as to admit of the free circulation of the air among them, let the wind blow from what quarter it may, is of the highest importance. In practice it but too frequently occurs that the corn-stands are placed in rows, sufficiently far apart in one direction, but too close on the other; so that, to suit this theory, the wind should always blow from one or the other of two opposite points of the compass. The fallacy of such a course requires no refutation, for the wind may never blow from either of them; and when it blows right across, the air is almost as confined as it is in those cases where the farmer commences at one corner of the yard and concludes at the opposite, filling up the intermediate ground as close as it is possible to pack the stacks together!

It requires a large area of ground to admit of the stacks being placed sufficiently far apart in every direction, so as to ensure the proper ventilation of the stack-yard—much more so than is generally allowed. Economy here is generally very short-sighted; for more loss is sustained in the quality of the corn and straw than would cover the extra ground ten times over. But when the stack-yard is being laid off, subsequent losses are not thought of, ideas being confined to some useless corner in which to huddle the whole produce of harvest! This is unpardonable of itself, though it falls very far short of unveiling the worst view of the picture; for in the olden time the principal amount of corn was housed in barns, *useless corners* being appropriated to the hay-stack and "wood-yard;" but now that the in-door system has given way to the out-door, the hay stack, firewood-stack, lumber, &c., &c., must be huddled closer together, so as to contain the whole!—so miserable is management here, that there is probably no department of the farm susceptible of greater improvement than the stack-yard.

Two plans have been adopted for obviating the loss of land, and securing, at the same time, ample room for effecting ventilation. The most important of the two is to take a crop off the stack-yard annually. Contiguous to the barn a small field is enclosed with rails, sufficiently large to hold the whole number of stacks in the worst seasons. In wet seasons stacks cannot be made so large as in dry, while there is generally a larger bulk of straw, so that the number is sometimes double in the former that it is in the latter; hence the additional area required. In harvest the farmer generally knows what is best for seed, which is stacked at an out-side—generally that next the barn—along with the hay stack, and what is intended for summer thrashing. Corn-stands are placed in the corners, the one above the other, in the usual manner, and covered up as the stacks are thrashed; and where they have centre frames, these are stacked by themselves, along with "props," and the like. The greater part of the whole ground is thus got cleared before the end of seed-time, and then ploughed and sown with some early-ripening crop, as bere or big, or tares, &c. The ground requires to be thoroughly drained, to keep it from cutting with the horses' feet and carts. Portable railroads might be used for hauling into the barn on tenacious clay soils. The corn grown in such cases is only fit for horses, from the seed having been mixed with that of the shakings in taking in the stacks; but this hardly reduces its value, which is considerable—the field being estimated as the most profitable one of its size on the farm, apart from its value as a stack-yard.

The second plan is to enclose with hurdles, or some such temporary fence, if required, a part of a field adjoining the homestead, and there to build the extra number, if the stack-yard is badly situated as to ventilation. Sometimes a small grass paddock is permanently enclosed for the twofold purpose of young calves and the like, and extra stacks in harvest. In such cases care is always taken not to crowd the stack-yard. In early dry years, when the sheaves are got so thoroughly dry as to keep in any size of stacks, they are made as large as the size of the barn and conveniency of thrashing will admit; but in wet years they are not only made less in diameter, but further between centre and centre, or, if the corn-stands are fixed, a stand here and there is left empty to let any air of wind there is play freely among the stacks.

Both these plans are deserving of notice this year, in provinces which in ordinary seasons have no need of them; but in those in which they exist, where dry harvests are the exception, such are not enough, various other contrivances being necessary—such as central

frames of wood, building in layers of brushwood, &c., alternately along with the sheaves.

There are several ways of placing wood in the heart of stacks, for the two-fold purpose of keeping the sheaves from "settling down" too closely together, and of allowing the egress of heated air from the interior, of which there is always less or more, and the ingress of cool, to dry the sheaves and carry off moisture. In all those provinces, the corn has to undergo the process of drying in the stackyard before it is fit for being threshed for market; indeed, the provinces are few in number where it does not do so, less or more—*in none*, it may almost be said, in years like the present. Sometimes a hollow frame is placed in the centre, for the purpose of allowing air to rise from the bottom and escape through a small opening below the eave of the stack outwards; sometimes this latter auxiliary is omitted, when the hollow is of little use, as it then remains full of heated air so long as the stack is in danger of heating, or so long as it (the hollow) is required. In the absence of corn-stands elevated on pillars, the hollow in the centre communicates with the outside at the bottom in one or more openings. But the inside air theory, by means of hollow frames, has never been experienced a successful one. The more important use of wood is to keep the stack from "settling down," as it is termed. In round stacks, those generally in use in the provinces in question, three poles are reared, meeting at the top, forming what is termed a "triangle." On elevated corn stands, a central pole is sometimes placed perpendicularly in the middle of the three; but where the stack is built on a low corn-stand on the ground—composed of loose stones, brushwood, or even straw—the triangle is all that is required, and, if placed with care in the middle, will support a great weight on its top. If not built in the centre, a prop on the outside will be required, or the stack will lean to the side furthest from the wood or top of the triangle. When a stack appears to heat, a sheaf or two are pulled out in different places, and sometimes holes made right through, until the evil is conquered. If the farmer is afraid of heating, a few props are placed at equal distances around the stack as soon as it is finished, to keep the outside from settling down.

When the triangle is thought not sufficient with the above props for a week or so, alternate layers of dry brushwood, broom, or even straw, are built along with the sheaves. Sometimes the stack is only "hearted" with such materials, there being only one row of sheaves outside. When the stacks are narrow, and the sheaves long, little "hearting" is required; and if such is composed of dry old straw, or brushwood, it has a very important effect, for it is generally bad sheaves in the centre that set the whole on fire.

Building in straw and brushwood, however, is found a great hindrance both in stacking and thrashing; and the more valuable and common auxiliary to the triangle is to select dry sheaves for hearting in the building, the outside and hearting being built together, and to throw over the stack any bad sheaves from which there is danger in the outside. When stooks are drenched with rain, it is seldom that they dry equally, two or more sheaves at one end or the centre being unfit for carrying when the others are ready. If eight are ready, for instance, and four not, the wise maxim is always to secure the former, leaving the "rogues" behind, as the latter are often called. Sometimes the field is three times gone over in this manner, a person going before every "pitcher," or person forking the sheaves, to separate the dry from the wet. The wet sheaves are easily known upon the fork, and sometimes a careful hand will throw them aside or leave them standing in pitching.

A good stacker is very valuable in a wet harvest; for we have known two stacks being built at the same time off the same field—the one heated and the other not, all because of the difference of the selection of the sheaves in stacking. It is seldom but that there are a sufficiency of dry sheaves for the heart, if carefully selected; if this is done, and the "rogues" tossed overboard, all may be well, even in very wet years.

SALE OF STOCK AT TORTWORTH COURT, GLOUCESTERSHIRE.

BY ORDER OF THE EXECUTORS OF THE LATE EARL DUCIE.

A most grateful compliment has just been paid to the memory of Lord Ducie. The ardour of the enthusiast has been put at that only it was worth—the pursuit of an object, or, as some might say, the gratification of a whim, had its success tested by the severest of measures. And the result of this must be recorded as great indeed. The amateur of a few years since has proved to have been essentially the practical man. The spirit with which Lord Ducie made his purchases has turned out to have been based on something stronger than the mere power of purse. And yet to this extent only were many of us inclined to give him credit. The wildness with which he would bid for an animal that he had made up his mind to have, became almost proverbial. A hundred guineas or so would never stop him; and when a lot was thus knocked down to his lordship, it was with a tolerably general conviction that he would never see his own again. Lord Ducie "made" many a sale of stock; but with all his spirit and all his means, he never made one equal to his own.

We have every reason for recording the sale at Tortworth Court, on Wednesday and Thursday last, as the most extraordinary and at the same time the most legitimately successful ever known. The character of the herd, and, it may be added, the character of the man, fairly presaged its importance; while the presence of the more celebrated breeders and buyers of short-horn cattle was reckoned on with some warrantable confidence. The issue, however, must have far exceeded the expectations of the most sanguine, extending as it did far beyond the limit of all such previous meet-

ings, and unquestionably opening a new era in the breeding of British stock. Lord Ducie's many heavy outlays, extravagant as they sounded, were only so by comparison at the time he made them. They are such no longer. Experience has shown there was scarcely one but in which he was fully justified, as a man of business, for all he did; while in venturing so far, he but further evinced that feeling which marked his whole career—that whatever was worth doing at all, was worth doing well.

It is a saying at Hyde-park Corner, that no one's horses sell like those of a dead man. There is a kind of granted guarantee of there being something more than a mere weeding intended, and purchasers have the confidence to bid in accordance. The Tortworth sale had, unhappily, for many reasons, this same assurance to offer to the public. Had the lamented owner been further spared to us, there were many animals included in the catalogue of Wednesday last which—high as they went—would scarcely at any price have been suffered to leave Tortworth. Beyond this, it was tolerably well understood that the present Earl had no intention of continuing the pursuit. Mr. Strafford stated this at the commencement of the sale; every lot went for just what the public thought proper to give. There was not a shilling "sweetened," and not an animal left to the estate it was sold on.

The two days' catalogue included, first, the shorthorn herd—cows, heifers, calves, and bulls; these, with the pigs, filling up the first day. On the second came the Southdown flock and the Cochin-China fowls. As must be, by this, well known to all our readers, the great attraction was centred in the shorthorns; unquestionably some of the best-selected and purest-bred in the kingdom. What the Collings so well commenced, Mr. Bates was equally remarkable for following up, and the best animals he left came direct from Kirklevington to Tortworth—at least so the world at large was then led to believe, and the attendance on Wednesday last fully confirmed the impression. There may have been larger numbers at Kirklevington; but never, perhaps, were there so many eminent breeders of all kinds of stock assembled together. The shorthorn men themselves, if not all to buy, anxious to see how the famed "Duchess" tribes fared in their new home, and watching—maybe with a somewhat jealous eye—what the determination of this noble Lord had really accomplished. Never could a verdict have been recorded as less one-sided. The Booths of Warlaby, Torr of Aylesby, Sir Charles Knightley, and other long-established and justly-celebrated men, met Lord Feversham, the Tanquerays, Towneleys, Jonas Webb, and others later in the field as breeders of this fashionable stock. With these came others hardly as yet so wedded to the sort, but whose names we may associate with those of whom the company generally consisted. It would be difficult to distinguish a tithe even of these; but amongst them we are enabled to enumerate the Earl Ducie and his brothers; Lords Feversham, Suffolk, and Lisburne; Mr. Langston, M.P.; Mr. W. Miles, M.P.; Mr. R. B. Hale, M.P.; Colonel Kingscote, Mr. T. T. Drake, Mr. Hyett, Mr. Towneley, Mr. Eastwood, Sir Chas. Knightley; the Revs. F. Thursby, J. D. Jefferson, Hon. Noel Hill; Messrs. Tanqueray (3), Fisher Hobbs, Field, Gunter, Colvin, Jonas Webb, Bells (2), R. Booth, W. Torr, Greenfell, Sanday, Buckley, Barthropp, Allen, Crisp, Druce (2), Woodward, Stratton, Niblet (2), Sainsbury, Morton, Ambler, Bolden (2), Gamble, Bowly, Kirkham, Topham, Proctor, Harvey Coombe, Ricardo, Gillett; with the agents of the Dukes of Beaufort and Marlborough, Lords Spencer, Howe, Fitzwilliam, Portman, Walsingham, Exeter, Radnor, Andover, Burlington, and other noblemen and gentlemen; as well as several Americans, and hosts of others whose names have escaped us.

Tuesday, and the Wednesday morning up to one o'clock, were devoted to the inspection of the different lots. The shorthorns were almost unanimously allowed to be in the acmè of breeding condition; while the Earl's judgment in selecting them as suitable to the soil and climate of Tortworth had able confirmation in the appearance of the animals themselves. They had all, both old and young stock, what the Yorkshiremen call the "bloody" look, so peculiar to the well-bred shorthorn; as manifest, indeed, in the pure-bred cow as in the thorough-bred horse, and warranting the long and high pedigrees of which each one could boast.

The white pigs, bred from Lords Carlisle and Wenlock, and Messrs. Brown, Watson, and Wiley's sorts, were as generally admired, and the Cochin-China fowl, both in colour and form, showed a very strong sample of this recent addition to the farmyard family. The sheep, on the other hand, were not so highly approved of. They were evidently not so well adapted for the land; and, with the exception of some of the ewes, had a roughish and not very promising look. They were known, however, to be also bred from the best sorts—the names of the Duke of Richmond, Colonel Kingscote, and Captain Pelham, with Messrs. Barclay, Ellman, Harris, Rigden, and Jonas Webb answering for their purity in the catalogue, and tending much to the very high prices they fetched at the hammer.

These prices may be left in a very great degree to speak for themselves. We give them as fully as possible, with a description of the lot, and, as far as ascertainable, the name of the purchaser. Amongst the latter will be found several American gentlemen who added unquestionably to the success of the sale by the spirit with which they opposed and generally tired out many of the home-buyers. The shorthorn herd, consisting of sixty-two lots, realized close upon ten thousand pounds, making an average of upwards of one hundred and fifty pounds each animal. In the choice amongst these, of course the direct Duchess kinds stood highest. A red four-year-old cow (Duchess 64) was knocked down at six hundred guineas to Mr. Thorne, an American; a roan heifer, rising three years old (Duchess 66), for seven hundred guineas, was bought for Col. Morris, President of the New York State Agricultural Society. A heifer calf of the latter, some six or seven weeks old, brought three hundred and ten guineas—a heifer and her calf thus making more than a thousand guineas! Such prices as those we have just instanced are altogether beyond record. Lord Ducie, we believe, when "the whim" was very strong on him, once gave five hundred for

two cows; but what his own reached are far beyond even the best days of the Kirklevington era. Some other of this year's calves, more especially, were knocked down at equally extraordinary prices—one to Mr. Tanqueray at four hundred, and a yearling to Mr. Gunter (who also bought Duchess 70) at three hundred and fifty.

The two bulls in use are both, we are told, bought for America. The Duke of Gloucester is one of Lord Ducie's own breeding; the Duke of York he purchased at Mr. Bates's sale for two hundred, having a gentleman commissioned to give six. He entered the lot himself, however, at the two hundred, and there was no subsequent offer against him.

We call the serious attention of our breeders to the result of this sale. It is but another proof of what the union of capital and judgment may do, as of how certain a spirited outlay is to repay the man who devotes himself in any way to the pursuits of agriculture. The one secret of this wonderful success was Lord Ducie's determination to have *the best*. It was this alone that directed his purchases, and this that has regulated the returns. The world has certainly received and stamped his efforts with the highest compliment that could be paid. He must remain now as equally an example to landlord and tenant—demonstrating, as his career does, how much good a country gentleman may thus do for the community, and with how little loss to himself or to his family.

It would be unfair to conclude this notice without one word for the manner in which the business of the two days was conducted. We never saw a sale better managed—and we believe we have to thank alike the present Earl, Colonel Kingscote, Mr. Langstone, with other members or connections of the family, as well as Mr. Strafford, the auctioneer, for their well-directed services on the occasion. A man better qualified for his office than Mr. Strafford it would be almost impossible to select. With a most intimate knowledge and judgment of short-horn stock he now unites the experience of many public sales. He appears, too, to have gained the thorough confidence of the public; and he certainly ruled his large audience of Wednesday last with excellent tact and firmness. His duties on the following day were confined to a comparatively small circle. The weather, which was all that could be desired on the Wednesday, was unfavourable; and judging from the numbers present, neither South-downs nor Cochins possessed a tithe of those attractions enjoyed by the Short-horns.

We give in the following list of prices the particulars of the short-horns sold, at somewhat greater length than is our custom. By so doing, however, this record will be of more value for future use, the pedigree going far enough to make its completion easily attainable by a reference to the "Herd Book":

COWS AND HEIFERS.

LOT. (THE FIGURES REFER TO COATES'S HERD BOOK.)

1. BESSY, roan, calved January 11, 1840; got by Helicon (2107), dam (Beeswing) by Sir Thomas (2636). 41 guineas—Col. Cator.
2. STELLA, roan, calved April 13, 1841; got by Rockingham (2550), dam (Starville) by Young Sea Gull (5100). 35 guineas—Mr. Noblett.
3. CHALLENGE, red and white, calved March 4, 1843; got by Morpeth (7254), dam (Cleopatra) by Helicon (2107). 44 guineas—Mr. Noblett.
4. DUCHESS 55TH, red, calved October 31, 1844; got by Fourth Duke of Northumberland (3649), dam (Duchess 38th) by Norfolk (2377). 50 guineas—Mr. Tanqueray.
5. VICTORIA, roan, calved April 20, 1845; got by Second Duke of York (5959), dam (Rachel) by Sir Thomas (7516). 44 guineas—Mr. Allen.
6. PRINCESS FAIRFAX, roan, calved October 3, 1845; got by Lord Adolphus Fairfax (4249), dam (Princess Royal) by Thick Hock (6601). 77 guineas—Mr. Greenfell.
7. NONSUCH, white, calved November 1, 1845; got by Duke of Cornwall (5947), dam (Nina) by Velocipede (5552). 50 guineas Earl of Burlington.
8. CHAFF, red and white, calved February 14, 1846; got by Duke of Cornwall (5947), dam (Challenge) by Morpeth (7254). 42 guineas—Col. Kingscote.
9. MINSTREL, red roan, calved March 14, 1846; got by Count Conrad (3510), dam (Magic) by Wallace (5586). 100 guineas—Mr. Tanqueray.
10. OXFORD 6TH, red, calved November 6, 1846; got by Second Duke of Northumberland (3646), dam (Oxford 2nd) by Short Tail (2621) 205 guineas—Mr. Tanqueray.
11. DUCHESS 59TH, roan, calved November 21, 1847; got by Second Duke of Oxford (9046), dam (Duchess 56th) by Second Duke of Northumberland (3646). 350 guineas—Mr Jonathan Thorne, New York, U.S.
12. MANTILLA, red and white, calved November 22, 1847; got by Cramer (6907), dam (Minerva) by Helicon (2107). 110 guineas—Mr. F. Ijambe.
13. VIRGINIA, white, calved February 6, 1848; got by Petrarch (7329), dam (Victoria by Second Duke of York (5959). 75 guineas—Mr. Hall.
14. POMP, white, calved April 3, 1848; got by Duke of Cornwall (5947), dam (Princess Royal) by Thick Hock (6601). 65 guineas—Mr. Greenfell.
15. LOUISA, roan, calved July 12, 1848; got by Cramer (6907), dam (Lady Bird) by Cato (6836). 78 guineas—Mr. Langstone.
16. BEATRICE, red, calved August 1, 1848; got by Cramer (6907), dam (Bessy) by Helicon (2107). 87 guineas—Mr Greenfell.
17. CHAPLET, roan, calved April 6, 1849; got by Usurer (9763), dam (Chaff) by Duke of Cornwall (5947). 54 guineas—Mr. Langstone.
18. VICTORINE, red and white, calved July 4, 1849; got by Usurer (9763), dam (Victoria) by Second Duke of York (5959). 46 guineas—Mr. Greenfell.
19. HORATIA, red, calved July 27, 1849; got by Usurer (9763), dam (Fair Helen) by Petrarch (7329). 30 guineas—Mr. Langstone.
20. DUCHESS 64TH, red, calved August 10, 1849; got by Second Duke of Oxford (9046), dam (Duchess 55th) by Fourth Duke of Northumberland (3649). 600 guineas—Mr. Thorne.
21. OXFORD 11TH, red roan, calved August 25, 1849; got by Fourth Duke of York (10167), dam (Oxford 6th) by Second Duke of Northumberland (3646). 250 guineas—Mr. Tanqueray.
22. FLORENCE, roan, calved October 12, 1849; got by Usurer (9763), dam (Florentia) by Zenith (5702). 62 guineas—Mr. Robinson
23. FATIMA, red and white, calved November 27, 1849; got by Victor (8739), dam (Felella) by Humber (7102). 70 guineas—Mr Carr.
24. MYSTERY, red, calved May 24, 1850; got by Usurer (9763), dam (Minstrel) by Count Conrad (3510). 200 guineas—Mr. Tanqueray.
25. BODDICE, red, calved June 29, 1850; got by Usurer (9763), dam (Bessy) by Helicon (2107). 115 guineas—Mr. Jonas Webb.
26. FLOURISH, white, calved October 21, 1850; got by Usurer (9763), dam (Florentia) by Zenith (5702). 71 guineas—Mr. Rich
27. DUCHESS 66TH, rich roan, calved October 25, 1850; got by Fourth Duke of York (10167), dam (Duchess 55th) by Fourth Duke of Northumberland (3649). 700 guineas—Col. Morris and Mr. Becar, New York, U.S.
28. VICTORY, white, calved November 25, 1850; got by

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Usurer (9763), dam (Victoria) by Second Duke of York (5959). 80 guineas—Major Blathwaite.

29. CHINTZ, roan, calved January 21, 1851; got by Usurer (9763), dam (Chaff) by Duke of Cornwall (5947). 70 guineas—Mr Greenfell.
30. FINANCE, roan, calved April 20, 1851; got by Usurer (9763), dam (Fudge) by Buchan Hero (3238). 90 guineas—Mr. Crawley.
31. CHINA, roan, calved December 25, 1851; got by Fourth Duke of York (10167), dam (Chaff) by Duke of Cornwall (5947). 90 guineas—Lord Feversham.
32. BODKIN, red and white, calved February 12, 1852; got by Fourth Duke of York (10167), dam (Beatrice) by Cramer (6907). 56 guineas—Mr. Robinson.
33. LUCY, white, calved March 19, 1852; got by Usurer (9763), dam (Louisa) by Cramer (6907). 40 guineas—Mr. Hall.
34. HORNET, roan, calved April 16, 1852; got by Contract (10071), dam (Horatia) by Usurer (9763). 43 guineas—Earl Howe.
35. DUCHESS 67TH, white, calved May 16, 1852; got by Usurer (9763), dam (Duchess 59th) by Second Duke of Oxford (9046). 350 guineas—Mr. Gunter.
36. PARLIAMENT, roan, calved June 5, 1852; got by Fourth Duke of York (10167), dam (Pomp) by Duke of Cornwall (5947). 56 guineas—Mr. Greenfell.
37. OXFORD 15TH, red, calved June 12, 1852; got by Fourth Duke of York (10167), dam (Oxford 6th) by Second Duke of Northumberland (3646). 200 guineas—Earl of Burlington.
38. BIBBY, white, calved August 21, 1852; got by Fourth Duke of York (10167), dam (Bessy) by Helicon (2107). 51 guineas—Mr. Greenfell.
39. PRIDE, roan, calved September 6, 1852; got by Fourth Duke of York (10167), dam (Princess Fairfax) by Lord A. Fairfax (4249). 165 guineas—Mr. Greenfell.
40. DUCHESS 68TH, red, calved September 13, 1852; got by Duke of Glo'ster (11382), dam (Duchess 64th) by Second Duke of Oxford (9046). 300 guineas—Mr. Thorne.
41. CHANCE, red and white, calved January 6, 1853; got by Duke of Glo'ster (11382), dam (Chaplet) by Usurer (9763). 56 guineas—Mr. Robinson.
42. VIOLET, red, calved February 26, 1853; got by Fourth, Duke of York (10167), dam (Victoria) by Second Duke of York (5959). 48 guineas—Mr. Barthropp.
43. SNOWDROP, white, calved February 26, 1853; got by Fourth Duke of York (10167), dam (Science) by Sir Thomas Fairfax (5196). 120 guineas—Earl Spencer.
44. DUCHESS 69TH, white, calved March 19, 1853; got by Fourth Duke of York (10167), dam (Duchess 59th) by Second Duke of Oxford (9046). 400 gs—Mr. Tanqueray.
45. LIZZY, red and white, calved April 29, 1853; got by Fourth Duke of York (10167), dam (Louisa) by Cramer (6907). 81 guineas—Mr. Greenfell.
46. OXFORD 16TH, red roan, calved May 17, 1853; got by Fourth Duke of York (10167), dam (Oxford 6th) by 2nd Duke of Northumberland (3646). 180 guineas—Mr. Tanqueray
47. DUCHESS 70TH, red and white, calved July 8, 1853; got by Duke of Glo'ster (11382), dam (Duchess 66th) by 4th Duke of York (10167). 310 guineas—Mr. Gunter.
48. PARADE, roan, calved August 7, 1853; got by Duke of Glo'ster (11382), dam (Pomp) by Duke of Cornwall (5947). 73 guineas—Mr. Greenfell.
49. VANQUISH, red and white, calved August 8, 1853; got by Fourth Duke of York (10167), dam (Victorine) by Usurer (9763). 30 guineas—Mr. Phillips.

BULLS.

1. DUKE OF GLO'STER (11382), red, calved September 14, 1850; got by Grand Duke (10284), dam (Duchess 59th), by Second Duke of Oxford (9046). 650 guineas—Mr Tanqueray, for himself, Col. Morris, and Mr. Becar, New York, U S.
2. FOURTH DUKE OF YORK (10167), roan, calved December 22, 1846; got by Second Duke of Oxford (9046), dam (Duchess 51st) by Cleveland Lad (3407). 500 guineas—Mr. Bell, supposed for General Cadwallador, Poiladelphia, U S.
3. CORNWALL, white, calved May 30, 1852; got by Con-

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tract (10071), dam (Nonsuch) by Duke of Cornwall (5947). 61 guineas—Mr. Mace.

4. UNCLE TOM, white, calved June 15, 1852; got by Fourth Duke of York (10167), dam (Ursula) by Usurer (9763) 37 guineas—Mr. Saunders.
5. VAMPIRE, roan, calved July 18, 1852; got by Fourth Duke of York (10167), dam (Victorine) by Usurer (9763) 120 guineas—Mr. Booth
6. FRANKLIN, red, calved October 20, 1852; got by Fourth Duke of York (10167), dam (Fatima) by Victor (8739). 80 guineas—Mr. Miles.
7. CHELTENHAM, red and white, calved December 18, 1852; got by Duke of Glo'ster (11382), dam (Chaff) by Duke of Cornwall (5947). 125 guineas—Mr. Jonas Webb.
8. FLORIAN, white, calved December 28, 1852; got by Fourth Duke of York (10167), dam (Florentia) by Zenith (5702) 58 guineas—Mr. Dickinson.
9. FIFTH DUKE OF OXFORD, red, calved March 6, 1853; got by Duke of Glo'ster (11382), dam (Oxford 11th) by Fourth Duke of York (10167). 300 guineas—Lord Feversham.
10. GLOUCESTER, red and white, calved April 3, 1853; got by Duke of Glo'ster (11382), dam (Beatrice), by Cramer (6907). 120 guineas—Lord Feversham.
11. FRANCISCO, roan, calved April 30, 1853; got by Fourth Duke of York (10167), dam (Florence) by Usurer (9763). 150 guineas—Marquis of Exeter.
12. NORMAN, white, calved May 8, 1853; got by Fourth Duke of York (10167), dam (Nonsuch) by Duke of Cornwall (5947), 100 guineas—Mr. Robinson.
13. MARQUIS, red and white, calved June 14, 1853; got by Duke of Glo'ster (11382), dam (Matilda) by Cramer (6907). 75 guineas—Earl Fitzwilliam.

LOT

SOWS.

1. SPOT, 27 guineas—Mr. Field.
2. MISS BROWN, 55 guineas—Mr. Thursby.
3. SLUT, 16 guineas—Mr Booth.
4. MOPSY, 17 guineas—Mr. Field.
5. MOLLY, 17 guineas—Mr. Field.
6. SALL—not produced.
7. SUKEY, 19 guineas—Mr. Barthropp.
8. SIMPLE, 38 guineas—Mr. Gunter.
9. SPICY, 19 guineas—Mr Fryer.
10. SUSY, 22 guineas—Lord Portman.
11. COSY, 22 guineas—Mr Fryer.
12. BAB, 19 guineas—Prince Albert
13. RELIC, 15 guineas—Mr. Niblet.
14. DOLLY, 16 guineas—Colonel Kingscote.
15. BUSY, 14 guineas—Mr. Robinson.
16. BONNY, 21 guineas—Mr. Booth.
17. BUXOM, 11 guineas—Mr. Thurnell.
18. BUSTLE, 18 guineas—Major Blathwaite.
19. GILT, 11 guineas—Mr. Bengough.
20. GILT, 24 guineas—Lord Lisburne.
21. GILT, 26 guineas—Prince Albert.
22. GILT, 10 guineas—Mr. Niblet
23. GILT, 18 guineas—Lord Portman.
24. GILT, 11 guineas—Colonel Kingscote.
25. GILT, 10 guineas—Prince Albert.
26. GILT, 7 guineas—Mr. Booth.
27. GILT, 6 guineas—Mr. Carr.
28. GILT, 10 guineas—Mr. Bengough.
29. GILT, 5 guineas—Lord Lisburne.
30. GILT, 6 guineas—Mr. Gunter.

LOT

BOARS.

1. DAN, 21 guineas—Mr. Robinson.
2. HARRY, 14 guineas—Mr Vivian,
3. BOAR, 30 guineas—Lord Lisburne.
4. BOAR, 62 guineas—Mr Booth.
5. BOAR, 27 guineas—Lord Portman.
6. BOAR, 10 guineas—Mr. Hyett.
7. BOAR, 9 guineas—Prince Albert.
8. BOAR, 6 guineas—Major Blathwaite.

On the following day the sale of sheep took place. 18 pure Southdown rams and ram lambs brought £326 10s., 79 lots of ewes wethers and wether lambs £2,176 5s.--together, £2,502 15s.

The Cochin Chinas followed; the 64 lots realized £340 4s., "Sir Robert," the celebrated prize bird, fetching 27 guineas: Lord Ducie gave 40 guineas for him in February last.

Total amount of sale £12,930 6s.

The following table will show the number, name, age, price, and purchaser at one glance:—

No.	Name.	Age.	Price.	Purchaser.
	Cows & Heifers.		Gs.	
1	Bessy.. ..	13½ years	41	Col. Cator, Bromley
2	Stella.. ..	12½ „	35	Mr. Niblet, Bristol
3	Challenge ..	10½ „	44	Ditto ditto
4	Duchess 55 ..	9 „	50	Mr. Tanqueray, Hendon
5	Victoria ..	8½ „	44	Mr. Allen, Staffordsh.
6	Princess Fairfax	8 „	77	Mr. Greenfell, Berks
7	Norwich ..	7½ „	50	Earl of Burlington
8	Chaff.. ..	7½ „	42	Col. Kingscote, Gloucestershire
9	Minstrel ..	7½ „	100	Mr. Tanqueray, Hendon
10	Oxford, 6 ..	6½ „	205	Ditto ditto
11	Duchess 59 ..	5½ „	350	Mr. Thorne, New York
12	Manitilla ..	5½ „	110	Mr. Foljambe, Notts.
13	Virginia ..	5½ „	75	Mr. Hall, Woodstock
14	Pomp.. ..	5½ „	65	Mr. Greenfell
15	Louisa ..	5 „	78	Mr. Langston, M.P., Oxford
16	Beatrice ..	5 „	87	Mr. Greenfell
17	Chaplet ..	4½ „	54	Mr. Langston, M.P.
18	Victorine ..	4 „	46	Mr. Greenfell
19	Horatio ..	4 „	30	Mr. Langston, M.P.
20	Duchess 64 ..	4 „	600	Mr. Thorne, New York
21	Oxford 11 ..	4 „	250	Mr. Tanqueray, Hendon
22	Florence ..	4 „	62	Mr. Robinson
23	Fatima ..	3½ „	70	Mr. Carr, Settle, York
24	Mystery ..	3½ „	200	Mr. Tanqueray, Hendon
25	Boddice ..	3 „	115	Mr. Jonas Webb
26	Flourish ..	3 „	71	Mr. Rich, Gloucestersh.
27	Duchess 66 ..	3 „	700	Col. Morris & Mr. Becar, New York
28	Victory ..	2 yr. & 9 mo.	80	Major Blathwaite
29	Chintz ..	2 „ 7 „	70	Mr. Greenfell
30	Finance ..	2 „ 5 „	90	Mr. Crawley, Beds.
31	China.. ..	1 „ 8 „	90	Lord Feversham
32	Bodkin ..	1 „ 6 „	56	Mr. Robinson
33	Lucy	1 „ 5 „	40	Mr. Hall
34	Hornet ..	1 „ 4 „	43	Earl Howe
35	Duchess 67 ..	1 „ 3 „	350	Mr. Gunter, Brompton
36	Parliament ..	1 „ 2 „	56	Mr. Greenfell
37	Oxford 15 ..	1 „ 2 „	200	Earl of Burlington
38	Bibby.. ..	1 „	51	Mr. Greenfell
39	Pride.. ..	11½ „	165	Ditto
40	Duchess 68 ..	11 „	300	Mr. Thorne, New York
41	Chance ..	7 „	56	Mr. Robinson
42	Violet.. ..	6 „	48	Mr. Barthropp, Suffolk
43	Snowdrop ..	6 „	120	Lord Spencer
44	Duchess 69 ..	5 „	400	Mr. Tanqueray
45	Lizzy.. ..	4 „	81	Mr. Greenfell
46	Oxford 16 ..	3 „	180	Mr. Tanqueray
47	Duchess 70 ..	7 weeks	310	Mr. Gunter
48	Parade ..	14 days	73	Mr. Greenfell
49	Vanquish ..	13 „	30	Mr. Phillips, Devonsh
	Bulls & Calves.			
50	D. of Gloucester	3 years	650	Mr. Tanqueray
51	4th D. of York	6½ „	500	Mr. Bell, Kirkleavington
52	Cornwall ..	1 yr. & 3 mo.	61	Mr. Mace, Gloucestersh.
53	Uncle Tom ..	1 „ 2 „	37	Mr. Saunders
54	Vampire ..	1 „ 1 „	120	Mr. Booth, Berks.
55	Franklin ..	10 „	80	Mr. Miles, M.P.
56	Cheltenham ..	8 „	125	Mr. Jonas Webb
57	Florian ..	8 „	58	Mr. Dickinson, Westmoreland
58	5th D. of Oxford	5½ „	300	Lord Feversham
59	Gloucester ..	4½ „	120	Ditto
60	Francisco ..	4 „	150	Marquis of Exeter
61	Norman ..	3½ „	100	Mr. Robinson, Berks
62	Marquis ..	2 „	75	Lord Fitzwilliam.

SUMMARY.

49 Cows and heifers, sold for	£6,867	0	0
13 Bulls and bull calves, „	2,494	16	0
Total	£9,361	16	0

Deeming this sale of such importance, we avail ourselves of the following analysis, comparing its proceeds with that of the Kirkleavington herd, and Charles Colling's sale at Ketton, from the *Newcastle Journal*:—

On the occasion of the Kirklevington sale in 1850, we expressed our conviction of Mr. Bates's herd of shorthorns being the very best in existence, and the breed having been brought—particularly in the Duchess family in the herd in question—by that gentleman to a degree of excellence not previously attained. However some might demur to the correctness of such an opinion at the time, the following analysis of the sale that has just taken place in Gloucestershire, at prices without any previous parallel, in which the animals purchased at Mr. Bates's sale, and those descended from them, sold for incomparably greater amounts than the others, will at once set any doubt on the subject at rest.

Referring to our priced catalogued of the Kirkleavington sale, on the 9th of May, 1850, we find the late Earl of Ducie to have been the purchaser of six head, viz.:—One cow, Duchess 55th, bulled by Fourth Duke of York (10,167); two heifers, Oxford 6th and Duchess 59th, both bulled by Grand Duke (10284), which was purchased by Mr. Hay, of Shethin, in Aberdeenshire, for £215 5s., and which was the highest priced animal in the sale; two heifer calves, of nine months old, Duchess 64th and Oxford 11th; and one bull, Fourth Duke of York. The prices for which these animals severally sold at Kirkleavington and at Tortworth are as follow:—

	Prices at Kirkleavington, May 9, 1850.	Prices at Tortworth, Aug. 24, 1853.
Duchess 55th ..	£110 5 0	£52 10 0
Oxford 6th	131 5 0	215 0 0
Duchess 59th ..	210 0 0	367 0 0
Duchess 64th ..	162 15 0	630 0 0
Oxford 11th.. ..	131 5 0	262 10 0
Fourth Duke of York	210 0 0	525 0 0
Total ..	£955 10 0	£2,052 15 0
Average per head..	£159 5 0	£342 2 6

which average price of Tortworth sale would have been considerably greater but for the comparatively low price of Duchess 55th, in consequence of a doubt being entertained respecting her further capability of breeding.

The produce of the foregoing, after becoming the property of his lordship, were—

2 Heifers,	sold for	£935	0	0	averaging	£472	10 0
4 Heifer calves	..	1,249	10	0	—	312	7 6
1 Bull ..	..	682	10	0	—	682	10 0
1 Bull calf ..	..	315	0	0	—	315	0 0
8 Head.		£3,192	0	0		£399	0 0

Of the foregoing, the heifer (Duchess 66th) and calf (Duchess 70th), only 6 weeks and 5 days old, together sold, as already noticed, for £1,060 10s.!

Of half-blood to the herd of the late Mr. Bates, were

1	Cow, which sold for	£46	4	0	averaging	£46	4	0
5	Heifers	633	3	0	—	126	12	7
7	Heifer calves ..	601	13	0	—	85	19	0
2	Bulls	164	17	0	—	82	8	6
7	Bull calves .	743	8	0	—	106	4	0
22	Head	£2,189	5	0		£99	10	3

Cattle, the dams of which are by Second Duke of York, bred by the late Mr. Bates :—

3	Cows, which sold for	£211	1	0	averaging	£70	10	0

Other cattle, not closely allied to the herd of the late Mr. Bates :—

17	Cows, which sold for	£1,323	0	0	averaging	£77	16	6
5	Heifers	329	14	0	—	65	18	10
1	Bull	64	1	0	—	64	1	0
23	Head.	£1,716	15	0		£74	12	10

The summary being :—

27	Cows, which sold for	£3,843	0	0	averaging	£142	6	7½
11	Heifers	1,172	17	0	—	106	12	5½
11	Heifer calves ..	1,851	3	0	—	168	5	9
5	Bulls	1,436	8	0	—	287	5	7
8	Bull calves ..	1,058	8	0	—	132	6	0
62	Head.	£9,361	16	0		£151	0	0

Such, then, is the result of the sale of the herd of shorthorns of the late Earl of Ducie, amongst which the animals belonging to the Duchess family brought by far the highest of the unparalleled prices for which the whole of the herd sold. This Duchess family originated with the two-years-old heifer, Young Duchess, purchased by Mr. Bates at Charles Colling's sale, October 11, 1810, for 183 guineas. This heifer was by the bull Comet, which sold at the same sale for 1,000 guineas, dam by Favourite (252), g. d. by Daisy Bull (186), gr. g. d. by Hubback (319), the bull from which Colling's improved breed had its origin; and the improvement thus begun at Ketton was further carried out in all integrity of perfect purity of breed by Mr. Bates, in the tribe so long known as the Duchess family, to the sixty-fourth generation from Young Duchess; and further continued without alloy of blood to the seventieth generation by the late Earl of Ducie, with the unprecedented success we have recorded.

Whilst we are noticing the most extraordinary sale of short-horned cattle that has hitherto taken place, and perhaps may ever in time to come occur, the following epitomised results of the most remarkable sales of shorthorns since the improvement of the breed by Charles Colling, may not be uninteresting to a large portion of our readers.

Charles Colling's sale at Ketton, near Darlington, Oct. 11, 1810 :—

17	Cows, which sold for	£2,802	9	0	averaging	£164	11	0
7	Heifers	848	8	0	—	121	4	0
5	Heifer calves ..	321	6	0	—	64	5	2½
11	Bulls	2,361	9	0	—	214	13	6½
7	Bull calves ..	687	15	3	—	98	5	0
47	Head.	£7,021	7	0		£149	0	9½

Robert Colling's sale at Barmpton, near Darlington, Sept. 29, 1818 :—

34	Cows, which sold for	£4,348	1	0	averaging	£127	17	8
17	Heifers	1,351	7	0	—	79	9	9¾
6	Bulls	1,410	3	0	—	235	0	6
4	Bull calves ..	748	13	0	—	187	3	4
61	Head.	£7,858	4	3		£128	16	4½

Earl Spencer's sale at Wiseton, Northamptonshire, in 1846 :—

104 Cows, Heifers, and Calves, and 19 Bulls, in all 123 head, sold for £8,468 5s., or averaging nearly £68 17s. per head.

The magnificent herd of the late Mr. Bates, at the time of its dispersion by the sale at Kirkleavington, near Yarm, in Cleveland, Yorkshire, on the 9th May, 1850, consisted of six distinct tribes or families; viz. :—the Duchess, the Oxford, the Waterloo, the Cambridge Rose, the Wild Eyes, and the Foggathorpe. The following is a summary of the sale :—

DUCHESS.

4	Cows sold for	£322	7	0	averaging	£80	11	9
3	Heifers	441	0	0	—	147	0	0
1	Heifer calf ..	162	15	0	—	162	15	0
4	Bulls	625	16	0	—	156	9	0
2	Bull calves ..	75	12	0	—	37	16	0
14	Head.	£1,627	10	0		£116	5	0

OXFORD.

4	Cows sold for	£288	15	0	averaging	£72	3	9
2	Heifers	95	11	0	—	47	15	6
4	Heifer calves ..	303	9	0	—	75	17	3
3	Bulls	206	17	0	—	68	19	0
13	Head.	£894	12	0		£68	16	4

WATERLOO.

2	Cows sold for	£101	17	0	averaging	£50	18	6
3	Heifers	180	12	0	—	60	4	0
1	Heifer calf ..	74	11	0	—	74	11	0
6	Head.	£357	0	0		£59	10	0

CAMBRIDGE ROSE.

1	Cow sold for	£47	5	0	averaging	£47	5	0
1	Heifer	73	10	0	—	73	10	0
1	Heifer calf ..	26	5	0	—	26	5	0
3	Head.	£147	0	0		£49	0	0

WILD EYES.

9	Cows sold for	£328	13	0	averaging	£36	10	4
7	Heifers	440	10	0	—	61	10	0
2	Heifer calves ..	64	1	0	—	32	0	6
4	Bulls	254	2	0	—	63	10	6
3	Bull calves ..	126	0	0	—	42	0	0
25	Head.	£1,203	6	0		£48	2	7½

FOGGATHORPE.

2	Cows sold for	£74	11	0	averaging	£37	5	6
1	Heifer calf ..	31	10	0	—	31	10	0
4	Bulls	222	12	0	—	55	13	0
7	Head.	£328	13	0		£46	19	0

The sale consisted of—

22	Cows, which sold for	£1,163	8	0	averaging	£52	17	7¾
16	Heifers	1,221	3	0	—	76	6	5¼
10	Heifer calves ..	662	11	0	—	66	5	1¼
15	Bulls	1,309	7	0	—	87	9	5¼
5	Bull calves ..	201	12	0	—	40	6	5
48	Head.	£4,558	1	0		£67	0	7

Had it not been for an impression which generally prevailed at the time amongst breeders, that, from change of pasture and climate, the progeny of the magnificent herd last noticed would probably become degenerate, much higher prices would have been realized at this sale; as no exception could be made to their surpassing in excellence every other herd in existence, or that had existed. The contrary, how-

ever, of such speculation has been sufficiently attested by the fact of the progeny of the animals purchased at the Kirkleavington sale, by the late lamented nobleman, having realized an average price of nearly £400 per head!—a price which, average though it be, has never been surpassed or even equalled by the price of any individual animal on record, except in a few instances in Charles Colling's sale, of Countess selling for 400 gs., Lily for 410 gs., and Comet for 1,000 gs.; in one instance, at Robert Colling's sale, of a bull having sold for 621 guineas, and at Wisetown, in 1848, Usurer was sold at 400 guineas; against which we can bring into comparison individual instances in the Tortworth sale, and in the progeny of both sires and dam from Mr. Bates's herd, Duchess 66th, at 700 guineas; Duchess 69th, at 400 guineas; Duke of Gloucester, at 650 guineas; besidess, Duchess 70th, a calf, only 6 weeks and 5 days old, daughter of Duchess 66th, and granddaughter both by sire and dam to animals from the Kirkleavington herd, 310 guineas; and the magnificent bull, Fourth Duke of York, the brightest gem of the Kirkleavington sale, sold at Tortworth, for 500 guineas; to which may be added the Grand Duke, recently sold by Mr. Bolden to Mr. Thorne, of New York, for 1,000 guineas, the price of his progenitor Comet However amounts may invite a comparison in prices between the Tortworth and the Ketton sales, let it be remembered that the latter took place in 1810, when the improvement in the shorthorn had not been long developed by the extraordinary genius and energy of Charles Colling, that the new breed was in few hands, and the very few herds that then existed were vastly inferior to that from which they originated, and that the former took place in 1853, when the improved shorthorns were diffused throughout the United Kingdom, nay, throughout the civilized world, with all the purity of blood and physical merits which authentic record of pedigree in the "Herd Book," and most careful attention can bestow, and then comparison as to the extraordinary merit, as indicated by the high price of the Tortworth with any other herd previously brought to sale, utterly ceases, and leaves the Tortworth sale without any parallel whatever in the annals of the breeding of shorthorn cattle.

The unapproachable pre-eminence in the Tortworth herd of shorthorns was the result of the determination of its noble proprietor, from the commencement of his career as a breeder, to possess none but the very best, no matter what they might cost: in which respect his judgment and energy were strikingly exemplified in his purchases at the Kirkleavington sale, at which his lordship commissioned a gentleman to go, for the Fourth Duke of York, as far as 600 guineas, and that if the price should exceed that sum, he would then himself continue the biddings until he purchased the animal; and had it not been an intending purchaser from the United States of America not arriving in time for the sale, and the delayed receipt of a letter, containing a commission to purchase the same bull at any price, from the same gentleman, in case of his not arriving in time to attend the sale, instead of the Fourth Duke of York becoming the property of Earl Ducie, at his lordship's upset offer of 200 guineas, it would probably have exceeded the price realized for Comet at the Ketton sale in 1810.

However transcendent the merits of the animals which comprised the Tortworth herd undoubtedly are, the unparalleled prices which they realized were not independent of the talents of the salesman—not so much perhaps from the efforts of the auctioneer during the sale as in the admirable manner in which the herd was brought to public notice by judiciously-written leading-articles and paragraphs, in terms of eulogy, which appeared in the columns of the leading journals devoted to agricultural affairs previously to the sale. To those who may not have had an opportunity of seeing the auctioneer, to whom was committed the responsible trust of conducting the sale of this extraordinary herd with such unexampled success, in the exercise of his professional duties, the following remarks on his qualifications may not be uninteresting:—In person Mr. Strafford is about the middle stature, with a well-formed figure, and a strikingly pleasing and intelligent countenance. He has a clear voice and distinct utterance; so that in the open air, with the most numerous company arranged round an open space of one hundred feet in diameter in which to exhibit stock, he can make himself distinctly audible, without effort, to all. With a knowledge of pedigree, which, in his capacity of editor of "Coates's Shorthorn Herd Book," few have an opportunity of acquiring, he possesses a judgment of the merits of individual animals equalled by few and surpassed by none. His address, whilst always respectful to his audience, is easy and perfectly free from affectation. In his remarks he strictly avoids grandiloquence, exaggeration of description, or witticisms; and his earnestness of manner evinces his feeling of the importance of the duty he has undertaken, for his principal. He is prompt, pertinent, and candid—always stating without reservation any faults in animals that may not be patent to an ordinary judge; and, in his replies to any question that may be put to him, he impresses his audience with his thorough knowledge of the business in hand, and gains their perfect confidence in his integrity; whilst a firm but just rebuke instantly represses any impertinent remark that may damage the value of the stock committed to his care. With such professional qualifications it is not too much to assert that Mr. Strafford has realized the very utmost amount that could, with strict integrity of dealing, possibly be obtained for the best herd of shorthorn cattle that has ever been produced.

AN EXAMPLE TO THE LORDS OF THE SOIL AND THE WHOLE WORLD.—REFLECTIONS ON HOLKHAM.

SIR,—The great improvements made by Mr Coke, late Earl of Leicester, on his estates at Holkham, particularly in

bringing waste lands into cultivation, must always excite admiration, and will, no doubt, astonish those readers of your valuable journal who are not cognisant of the advantage the celebrated agriculturist introduced. The following reflections are taken from an old MS. written by a gentleman in 1830, then on a visit to Holkham. "Having," said the writer, "accepted an invitation to spend the 1st September at Holkham, we arrived there at nine o'clock, and after being greeted with a hearty welcome by Mr. Coke, were introduced to Lady Anne and her sister, Lady Mary, with whom, and a party of nine gentlemen who had been invited to meet us, we sat down to breakfast, and the kind attention of our host and hostess soon made us feel at home. Breakfast being finished, Mr. Coke ordered his coach and four, with a barouche and pair, to convey himself and visitors on a farming tour; and as our particular object was to examine the crop of barley, every facility was offered us by our kind conductor, whose constant endeavour appeared to be to mingle the useful with the agreeable.

"The postilions were first desired to stop near some beasts of the North Devon breed, grazing in the park, and Mr. Coke mentioned several facts illustrative of the superiority of the North Devons; amongst others, that he called upon Mr. Hancock, Park-street, Grosvenor-square, butcher, who supplied some of the first families, and asked him if he had ever killed any Devon beasts. He replied, 'No; they were not good enough for his trade; he would only use the best Scots.' Mr. Coke persuaded him to try the Devons, and he so much approved of them that he bought all Mr. Coke sent to market for a considerable time—more than 100 beasts. He also mentioned a trial between the fattening of two North Devons against one short-horned ox of the old Yorkshire kind, the two costing the same as the one, and when killed the two weighed 140 stone of 14 lbs, while the short-horned ox weighed only 110 stone, and it had eaten more food than the two Devons. Mr. Coke considered the North Devons as by far the best for ploughing. His object was to produce the most food for man, of the best quality, at the least expense. He said 'size had nothing to do with profit: it was not what an animal made so much as what it cost making.'

"As we passed through the park, Mr. Coke gave us a very interesting account of the way in which his attention was first directed to agricultural pursuits. 'When,' said he, 'I first came to the Holkham estate in 1776, the land had been let for two leases, which came out in 1778. I then offered the tenants new leases at 5s. per acre, tithe free; but my offer was refused, and I was compelled to turn farmer, or take 3s. per acre. I chose the former, and, having been favoured with a long life, have certainly seen the estate greatly improved. When I came to it the rental was only £1,400 a year; but now I make £2,500 a year of thinnings of my plantations. At that time, upwards of 10,000 quarters of wheat were imported annually at the port of Wells: now there is full that quantity exported from the same place. At that time the population of Holkham was under 200: now it exceeds 1,100, all fully employed. At that period (1776), on 4,500 acres of land, which now forms Holkham-park, there were only 800 sheep kept: I have now planted 2,500 acres and keep 2,500 sheep.'

"We were all amused by an account from Mr. Coke of his first visit to his Majesty William the Fourth, whose hand he shook, instead of kissing it. The king gave him a hearty welcome, and said, 'Now, Coke, go home and take care of your freeholders.'

"It is worth a journey of 100 miles to see the village of Holkham. What a contrast does it present to that of Houghton, which we visited the day before! In Holkham every cottage is neat and clean; each cottage has a garden of considerable size; and for this neat house and garden he is only charged £2 2s. a year rent. It was not needful for me to ask if the poor men valued their gardens. The absence of weeds, the neat clipped hedges which surrounded them, and the excellent crops which they exhibited, told me, in language I could not misunderstand, that they were prized by their possessors. I wish all those gentlemen who suffer their cottages to be without the comfort of a garden, would be prevailed upon to visit the village of Holkham, and to follow the excellent example which is there set them.

"In the centre of the village is a school, which is under the peculiar care of Lady Anne. Such, indeed, is the attention bestowed upon the village, such the anxiety on the part of the owner and his lady that its inhabitants should eat the bread of industry and peace, that, were I to judge only from outward circumstances, I should at once say the inhabitants of this village must be happy.

"While looking at the crops of potatoes in the gardens, we had from Mr. Coke some interesting hints and observations on the culture of that useful esculent. He introduced it himself on the Holkham estate; but five years elapsed before he could prevail upon the poor people to eat or cultivate it. Such were their strong prejudices against the stranger he introduced among them, that he offered them land upon which to plant it without rent, but in vain, until at last he introduced the Ox Noble, a very large species, when they consented to raise a few, saying they might do for the pigs. Time, however, has wrought a mighty change, and Mr. Coke has been a fine example to all the world.

"It appears that Mr. Hancock's shop in Park-street, now Kirkby and Hancock, has ever since Mr. Coke introduced the North Devon been famous for North Devon and Scotch ox beef and at this time serves many of the first families in London, which proves Mr. Coke's opinion to be upon a solid foundation, because the North Devons have risen greatly ever since." S. A.

86, *a Vauxhall-street, Vauxhall, Surrey.*

THE HIRING, LETTING, AND SALE OF RAMS.

On this subject I shall be very brief. The two months of September and October form more particularly the season for breeders to supply themselves with rams to put to their flocks of ewes, and it is also the time of year for such purpose: the month of November being too late. Some difficulties may be in the way relative to keeping, and the weather in the early months for lambing; but, generally, the earliest lambs are the best, and most breeders have suitable contrivances for their ewes when lambing, and they provide for the early stages of their lambs, good shelter, and plenty of food.

It is the peculiar province of ram-breeders to breed stock rams for the use of common flock-breeders; and this mode of breeding has many advantages to both parties. The ram-breeder can afford

to procure and put to his flock of ewes better animals, and, of course, more expensive ones than would answer the purpose of an ordinary breeder to use. In this way the ram-breeder is enabled to keep up a more select and valuable flock, from which he can let or sell animals of a truly-valuable character to breeders for common use at a lower rate of prices; besides, it is also his peculiar province to look out for and introduce every practical improvement into his flock of which it is capable, by judicious selection from the flocks of other approved breeders, and in a great measure regardless of cost—the district depending upon him, expects these things of him: and if he is a man of judgment he will not fail them. He knows, or ought to know, the pedigree of every animal of his flock; and in this way he can and does suit any change of blood or feature to the wants of the flock. In this way he can also suit his friends or customers desiring or finding it requisite to change their blood or intermingle it in their flock; by his peculiar flock-marks he can on application recommend this and the other animal as changes from the usual selection of his friends, thereby rendering it unnecessary for them to resort to other breeders, which is at all times a dubious course to adopt; it is far better to keep to a flock you well know, and to the judgment of a breeder on whom you can depend: the breeding will not be running too close by following this practice.

Breeders should be very cautious in selecting their rams. The requirements of their flock of ewes should be particularly noticed, and a careful separation of them made before hiring, so as to ascertain more accurately their precise defects, and to point out with greater certainty the peculiar kind of ram necessary to rectify these defects: this should be done before procuring the ram—not to hire first, and then try and suit the ewes to him afterwards. Never hire or purchase a ram from an unknown flock. An inferior ram from a flock of well-known repute will produce better stock than an accidental good one from an inferior flock. By all means keep to a "good strain;" adhere to flocks of well-known and deserved celebrity: you are far more certain as to the result. There may be, and often is, much foolish fastidiousness in breeders relative to slight peculiarities in good animals: a spot, a slightly discoloured leg, or some little defect, is greatly magnified. These are of minor importance in good animals to common flock-breeders —they are important to ram-breeders, and are generally, if not universally, avoided; but no ordinary breeder need reject a good ram for a slight peculiarity: they will seldom be propagated in the flock, particularly if taken from a good stock.

Hiring and Sale.—It is always better for a breeder to hire a ram than to buy one, provided he is guaranteed a good season with him. Rams "now-a-days" are so highly kept, so pampered, that vast numbers of them are very defective stock-getters. On this account it is better to hire than to buy. *Shearling or yearling rams* are undoubtedly the most active amongst the ewe flock, and are mostly sought after by flock-masters, but a good *two-shear ram* is to be preferred, if of known character. The shearling may prove right, and all you could wish: the two-shear ram is already proved; besides, his proportions are developed, and you know to a certainty what he is as a sheep. Experienced ram-breeders will generally hire a two-shear or even older sheep on this footing: it must not with them be a matter of doubtful character, and an old sheep well proved is to them a certain security for future benefit.

A shearling ram is generally supposed to be fully equal to serve from 75 to 80 ewes; but a two-shear ram should not have more than 70 to 75. In all cases, the breeder hiring should see that his rams are in every respect right and active before putting them to his ewes: much disappointment and loss often arise from these omissions.

In making choice of a ram to suit the ewe flock regard should be had to every requirement: neither "wool nor mutton" ought to take precedence—both must be held of equal value. If any quality is to be discontinued, or of necessity to be given up for the time, let it be beauty or symmetry, or some minor points: these are truly good in their place; but for these never give up the main qualifications—a good fleece, a fat back, and a full symmetrical proportion, of great substance.

In making choice of the ewes to put to each ram, much may be done to improve the flock. No breeder can find just the ram he wants—the very ram to suit his whole flock; he must therefore have the same due regard to what he most requires, and put his ewes to them accordingly. A "ram-breeder" will very properly put his choice ewes to his best ram, in order to obtain the best offspring; but a "common breeder" may vary his ewes so as to procure his flock of like make and proportions—a short-legged ram to a long-legged ewe; a full-chested ram to a narrow-chested ewe; a heavy-woolled ram to a light-woolled ewe; and so on, as his best judgment dictates—endeavouring to obtain from the male what is wanting in the female.

In breeding what are termed "half-breds," great care should be given to obtain rams from good flocks, or the end to be answered in making such stock quickly off is defeated. The very best of rams should be used, possessing every good qualification of wool, mutton, and symmetry. It is quite a mistake to fancy any ram will do for half-breeds: no such thing. We know of half-bred sheep remaining as long or longer on fattening pastures than many much heavier and less likely feeding sheep. If half-bred sheep are to retain favour with the grazier, they must be bred with every care and attention to the many qualifications. Many breeders use ram lambs for this purpose: this is wrong, no breeder can tell what a lamb is to make in his future life. In all cases, use the best ram or the best kind of ram you can obtain, and be not too nice about the price. I have known many flocks of lambs make from 3s. 6d. to 7s. per head more than others of the like size, solely from better and more correct breeding; and the difference is far greater as they grow up, and are fattened

GENERAL AGRICULTURAL CHEMISTRY, AND THE NATURE AND APPLICATION OF MANURES.—DRIFFIELD FARMER'S CLUB.

On Thursday the 7th June, a lecture was delivered in the Corn Exchange, Driffield, before the members of the Farmers' Club, by J. Nesbit, Esq., Principal of the Agricultural and Chemical College, Kennington, near London, on "General Agricultural Chemistry, and the Nature and Application of Manures." The Chair was occupied by T. Hopper, Esq.

The CHAIRMAN having introduced the lecturer, and announced the subject of the lecture,

Mr. NESBIT spoke as follows:—Mr. Chairman and Gentlemen: It is now some time since I had the pleasure of appearing before you in this room, to give some illustrations of the best modes of fattening stock, the nature of vegetable food, and so on; and I now appear before you for the purpose of offering some observations upon the nature of manures. In doing so, you must not suppose for one moment that I pretend to come before you to teach you mere ordinary practical farming; I intend, as far as I can, to illustrate your practice by observations which I shall have to make, and instances which I shall have to bring before you; and as I conceive that we are all the better for having some leading idea to connect together the facts with which we become acquainted in our general ordinary intercourse with things around us, I think I shall be able to give you a leading idea this evening, by which you will be enabled to connect many of the facts which you all know, and which will probably enable you to modify your farming operations, in many instances, with very considerable advantage. What I shall endeavour to do is this, to show "of what manure really consists, its real sources, and how it is most readily to be obtained;" and in so doing I shall first take the most general view of the subject I possibly can, and shall then gradually go into details and particulars with which you are all interested. If therefore for the first few minutes I lead you a little away apparently from the subject, you will find it will be all connected with it afterwards. Plants, gentlemen, are the subject of our inquiry to-night. The composition of the plant, the habit of the plant, we must ascertain before we can know what manures are adapted for it. Now if you look at the structure of ordinary land plants you will find that they are provided with roots which are sent down into the soil, and that these roots do not merely serve for the purpose of holding the plants in the soil; but, when they are examined, they are found to be full of minute vessels, which vessels have the power of absorbing from the soil materials rendered soluble by water, and of taking them up into the plant and so into the leaves. The leaves are spread abroad to the air, and when the sap which rises from the roots of the plant finds its way into the leaves, these leaves have the power during certain seasons of acting upon that juice, and preparing the materials upon which the plants grow. Now let me explain this again—the roots run down into the soil, and absorb certain materials from that soil; the leaves are sent into the air, and absorb certain materials from the air; and during sunlight or diffused daylight—when there is a certain amount of light and heat in the air, that is in summer or spring weather—the leaves have the power of uniting them all together, and forming the various substances which constitute the fabric of vegetables. Now we thus learn, gentlemen, that the root of land plants has other properties besides that of merely holding the plant. The roots of sea plants, on the contrary, only serve as means of attachment to the rocks. The leaves of sea plants perform the functions both of the roots and the leaves of land plants, because being constantly in contact with the water, they can absorb the saline matters from the sea water, as the land plants absorb the same from the soil by their roots; and they can also act on the organic matters by means of the light of the sun upon the leaves. The substances that are ordinarily taken up by the roots of vegetables, and those which are taken in by the leaf are very different. If you take any vegetable, say wheat, or wheat-straw, or hay, or any other material of the kind, and burn it, you send back into the air the materials which the plant originally derived from the air, and you have left behind, in the form of ash, the materials which the plant by its roots derived from the soil; so that we have a general division of the constituents of any vegetable body into two varieties—namely, those materials which are derived from the air, and which may be called atmospheric elements if you will, and those which have been derived from the earth, which may be called mineral or earthy elements. Now it will be apparent to you from what I have stated, that the whole manuring principle which a plant in its wild state can possibly obtain must come from the earth and from the air; for if we look around us we find that everywhere nature is quite capable of furnishing to wild plants all that they require. Now you shall take rocks which do not contain the slightest amount of any material that is obtained from the air, containing only mineral matter, and after they have been exposed to the air for a little while you will find them covered with vegetables of some kind or another. What is the common action of nature upon a bare rock that may be protruded in any way or shape? You first have some lichens (a kind of mushroom) growing over the surface of the rock. These plants have the power, without the aid of anything from the soil, excepting mineral ingredients, of attracting other ingredients from the air. After generations of these have grown and died, mosses will take their place, and will grow upon the remains of a kind of mould which has been made by the decay of the lichens. After the moss has grown some years you will find different kinds of natural grasses. These will be succeeded by others, until at last there may be, upon what was originally a bare rock, a

soil naturally formed, in which trees can grow and in which trees do grow from their seeds naturally sown upon it. Take again the lavas ejected from Vesuvius, Etna, and other volcanoes. These lavas, which have been molten and red hot when ejected, of course, contain no vegetable matter. They have not been long cooled before the wild fig tree and other plants sending their rootlets into the interstices spring up, and produce abundance of woody matter, which must evidently have been obtained from the air, as it did not exist in the soil. You may take another case, the case of a wild waste, such as we find in many parts of Scotland, where pines and other trees have grown up in a soil which contained at first little or no vegetable matter. These trees have grown for years, till, in the course perhaps of 30 or 40 years they are cut down and hundreds of loads of timber are taken away from every acre on which the trees were planted; and the soil is now richer in vegetable matter than before the trees were put there. It is clear therefore, gentlemen, that we have something in the air which these plants have the power of obtaining, and it is this power which enables nature to clothe the surface of various rocks with plants of various kinds, so as to present, even when man does not come on to the stage at all, one fine scene of foliage throughout the whole world wherever moisture and water and the other elements can be found. If it be the case, gentlemen, that plants do obtain a great portion of their nutriment from the air, you will see that the consideration of what is obtained from the air and what from the soil is very important indeed to gentlemen engaged in practical farming. Well now, if we examine the materials that are driven off by a red heat from any plant whatever, we find them to consist chiefly of four. One is carbon or charcoal. This is a most important element, and it is obtained from the air. Whenever charcoal is burned in an open fire you have a certain portion of the air called oxygen uniting with the charcoal and converting it into a gas, called carbonic acid gas, the nature of which I believe I showed you the last time I was here. I showed you that carbonic acid gas was given out from fermenting vats, and from the burning of all bodies containing charcoal; and that generally, whenever any vegetable or animal body decayed, this gas was given out and sent into the air. Air contains about two parts of carbonic acid gas in ten thousand. Another of the bodies which the plants derive from the air, that is from the water which comes down from the air, is hydrogen. This is found in all common coal gas, and it is found in water. Every nine tons of water contain one ton of this gas. Plants have the power of separating the hydrogen and of retaining it, giving off oxygen into the air. Then we have another body called nitrogen. Now the nitrogen is the basis of all animal muscle. It is found in large quantities in all the seeds of plants, because they are destined to feed animals, and animals require it for their muscle in large quantities. Nitrogen is derived by plants from certain of its combinations contained in the air. Then you have the body called oxygen, which is the vital principle of the atmosphere, which constitutes eight parts out of nine by weight of water, and which is abundantly offered to plants both by the air and by water. I mention these chemical bodies merely that they may be known, but I shall not allude particularly to their action, as I wish to keep as free as possible from technical phraseology. Well now, what is the effect of the leaves of plants upon the air, when they are acted upon by the light of the sun? These plants have the power of taking carbonic acid from the air by means of their leaves, and of retaining the carbon and sending back the oxygen. They have the power of taking the water in the same way, and, when acted upon by the light of the sun, of retaining the hydrogen and sending back the oxygen. They have the power also of acting upon a component of the atmosphere called ammonia, which contains nitrogen, and of retaining the nitrogen and also the hydrogen. This power they exert continually during the full bright light of the sun, and more slowly in the diffused light of day. If any of you wish to try the experiment, all you have to do is to take a bottle of soda water, which contains carbonic acid gas, and pouring some of it out, then fill it with common water, and invert it in a basin of water. Then take a few sprigs of fresh mint, introduce them under the water into the bottle, and expose that to the light of the sun, and you will find a very active action going on. Little globules of gas will be given off by the leaves of the mint. Now, oxygen is a gas very easily detected because anything burns in it much easier than in common air, and if you examine the liberated gas, and put into it a bit of paper just red hot at the end it will blaze in a moment—showing that the carbonic acid gas in the soda water is decomposed by the leaves of the mint under the action of the sun, the carbon being retained while the oxygen is given off. To show another instance of this powerful action under the influence of sunlight I will mention an experiment tried by a French philosopher. You are all aware that carbonic acid gas when sent through lime-water produces a white precipitate—I showed you that the last time I was here. The French philosopher took a long glass tube and inserted in it the branch of a living vine. He closed up one end of the tube, all but a single aperture through which he sent a current of air mixed with a certain portion of carbonic acid. The other end he also closed except one tube which was passed into lime water. As the carbonic acid would immediately produce a precipitate in lime water, he could at once tell whether the light of the sun, shining upon the branch in the tube, produced any effect upon the carbonic acid passing through. He first covered the tube to keep out the light, and passed the gas through the lime water, upon which it gave a dense white precipitate. He then took the jar of lime water away, took the cover off, and let the light of the sun in. He sent a current of gas through the lime water again, but not the slightest trace of carbonic acid made its appearance. Every particle of it had been absorbed and retained by the leaves of the plant for its own use. They had retained the carbon and given out the oxygen. You would hardly suppose that there existed in the air a sufficient quantity of this carbonic acid to

supply the great wants of vegetation; but if we come to calculate that the atmosphere is 40 miles high, that it contains two parts in 10,000 of this gas, that its weight is 15 pounds upon every square inch of the surface of the earth, we shall find the quantity a great many times more than all the carbon that exists in all the vegetation of the earth, and probably than exists in all the known coal-fields as well. The fact is that the quantity of carbon existing in the air would be more than abundant for a vegetation ten fold that of the present. When we consider the continual decay of vegetable and of animal matter, and that the whole of their carbon is returned to the air, we see that there never can be any want of carbon for the purposes of plants. Now from the water which falls from the air, plants obtain their hydrogen. In the same way, they have the power of retaining it, and giving back their oxygen. They have also the power of acting upon the ammonia, retaining the nitrogen, and giving off other materials which they do not want. From the soil they likewise obtain the mineral ingredients which they require, as, for instance, phosphate of lime. We all know that our bones contain a large amount of bone earth, or, as chemists call it, phosphate of lime. Now animals feed upon vegetables, and if the vegetables did not contain phosphate of lime, animals could not exist. All vegetables therefore, or those portions of vegetables which are adapted for animal life, contain phosphate of lime; they also contain certain portions of silica or sand in a soluble state, soda and potash, lime and magnesia, common salt, oil of vitriol or sulphuric acid in the form of sulphate of lime, or some other sulphate. These the plants derive from the soil, so that what constitutes manure for the plant is what the plant derives from the soil and from the air; that is to say, every substance, which is required to make up a plant, is adapted for manure. You will see then from what I state that the real sources of all manure are the air and the earth. No matter what the manure is, or where it comes from, you can trace it back to these sources, the air on the one hand, and the earth on the other. Now I want to point out to you one or two facts of very considerable importance. The first is that the plants in their ordinary natural state, such as they are found upon different soils, are adapted to take what they want from the air, yet when you come to work in an unnatural or artificial manner this does not do. If you were to leave your fields you know what would be the result; nature would fill them with plants that she thought would be well adapted for them. But you do not want those plants which nature would put there; you want to grow certain distinct kinds which will give you a profit in the market, but which are not natural or indigenous to the soil, or which would not naturally grow in remunerative quantities; therefore you will, in these circumstances, have to do somewhat differently from what nature does, or rather you will have to take nature to your assistance and make her work for you. Now one of the great powers which soils possess is that of absorbing from the air certain gaseous materials, the very same things that plants absorb. Let me allude a moment to ploughing or rather to fallowing. What do you do when you fallow the land? Do you not take and expose that land by repeated turnings to the action of the air? Do you not allow that land, if it has any absorbing powers, to absorb from the air what it can? Do you not allow it to lie porous, and give it all proper opportunities of acting upon the air? The consequence is that by fallowing you cause the porous body, the soil, to act upon the air, and to absorb into that soil a considerable portion of ammonia, nitric acid, carbonic acid, and other things which are essential for the growth of plants. You afterwards take a crop, and is it surprising that you find fallowing beneficial, when you have exposed the land, for twelve months without a crop, to the action of the air, when you not only have what the plants can take from the air by their leaves, but you have them taking up by their roots from the soil that which the soil has had 12 months allowed it to take from the atmosphere? Now that is a natural system of manuring; and it is a question whether under certain circumstances, this system is not good. But I want to point out to you that without draining it is perfectly absurd to think either of fallowing or of ploughing. What is the purpose of draining? If a soil by its porosity acts upon the air, as I have told you, when its pores are filled with water of course it can do no such thing. Therefore a *sine qua non* for all farmers, is either that their soil shall be naturally sufficiently porous that the water may descend and the air may enter, or that the soil shall be rendered artificially so by proper draining; and whatever I shall have to say with respect to the application of manures in general has no reference whatever to undrained land. It only refers to those lands that are in such a state of porosity that air and water can enter, so that they may have their decided proper action upon the atmosphere. Now allow me to point out another thing; I shall speak of it further when I come to speak of manures. I do not know whether you are aware what the atmosphere does. The atmosphere is a great source of one of these forms of manure. Nitrogen exists in the form of ammonia, as you have it in ladies' smelling bottles, and such as you smell it in stables (laughter); it also exists in the form of nitric acid, such as in nitrate of soda. Now, gentlemen, not only do soils absorb ammonia from the air in the way in which I have spoken, and also nitric acid, but the air itself gives every year to an acre of soil a quantity of ammonia and nitric acid which would astonish you. It has been proved by some very recent experiments, (not yet, I believe, noticed in this country,) made by a learned French chemist,* that the rain water which descends in the neighbourhood of Paris contains a quantity of nitric acid and ammonia, which I have calculated to be equal to a dressing of 2 cwt. of Peruvian guano per acre. If your land, therefore, is not drained, but plugged up with water to the surface, the splendid manures which descend in the rain to the extent I have spoken of, will run off over the surface, and by not entering the ground, will not be productive of more than one third or one fourth of their proper manuring value to your crops. Allow me to tell

* M. Barral, Comptes Rendus, vol. 34, p. 324.

you another thing. There ought to be calcareous matter in all your soils. There is plenty of it in this district; you have plenty of chalk about here; and in warm weather there is a process of absorption of ammonia from the air going on in these soils naturally; it is absorbed by the soil and converted into nitric acid. We are all apt to look upon salt-petre more as a means of blowing people's heads and bodies asunder than anything else; but we must not forget that salt-petre is one of the main articles of the farmer's production. We must not forget that in the wars of our revolution, in the time of Cromwell and Charles I., all the salt-petre with which they blew one another to pieces was made from the mortar of old walls, the bottoms of old stables, cow-houses, and other places where urine had been deposited; and when we were at war with France, in 1798, and cut off their supply of salt-petre from the East Indies, all the salt-petre used by Napoleon was made from similar sources—from the mortar or calcareous matter of old houses, from urine, from animal and vegetable matter collected from various sources, from the bottoms of cow-houses, stables, and other places where urine had penetrated. These, when properly mixed together, produced nitre. Now the way in which this action takes place is not at all difficult for me to explain to you, if I shall not be fatiguing you in so doing. The way in which the salt-petre heaps were made was this: a layer of calcareous matter was put upon the ground, perhaps 23 or 24 feet long, 12 feet wide, and a foot deep; upon that layer manure was put, horse manure, straw, animal matter, such as horse-flesh, or anything of that kind, then another layer of calcareous matter, such as marl, and old stable stuff, then a layer of manure, and so on, alternately. This heap was kept under cover, so as not to allow too large a quantity of water to fall upon it. It was kept moist by watering it with urine, or urine and water. When urine could not be procured, water alone was used. In three or four months the heap was turned over, being still occasionally watered with urine or water, for nine or ten months. After that time it was watered with water alone; no more urine was put to it, and no more vegetable or animal matter. In this manner, in fifteen or eighteen months, the whole of nitrogen and ammonia had united with oxygen and become converted into nitric acid. This acid as it formed united with the calcareous matter so as to form nitrate of lime, nitrate of magnesia, and so on. The heap was then put into a large tank, and well washed with water, which dissolved the nitrates. The liquor pumped away from the residue was boiled with wood ashes, which converted it into the nitrate of potash, which they wanted. It is not necessary for you to use wood ash, because the nitrates in any form are equally valuable to the farmer. This, then, is the way all the nitrates were formed during our own and during the French revolution. Now I want to point out to you that all soils whatever containing calcareous matter, that are porous, that are well worked, that have got vegetable or animal matter put in from your own farms, or any other way, are, more particularly in warm weather, always acting as nitre beds; and this has not been insisted upon as it ought with reference to the farming of this country. Wherever there is calcareous matter in the soil, wherever the soil is sufficiently porous and exposed to the air, you not only have the material contained in the soil acting, the ammonia oxydizing and giving rise to nitric acid, but you have a continual absorption of this material from the air. All nitre beds give rise to more nitre than the nitrogen in the ammoniacal and other substances put into them ought to give rise to, proving that there must be absorption from the air. This brings me to another point, namely, to the experiments of the Rev. Mr. Smith, of Lois Weedon, Northamptonshire. He has been growing wheat upon the same field year after year without the slightest addition of manure. He has been carrying out Jethro Tull's plan. Jethro Tull had a notion that by pulverizing the soil to a very great extent, he could make it sufficiently fine to pass through the pores of the roots and go into the plants, and thus there would be no want of manure at all. Now, although he had got hold of a bad theory, his practice was, to a very considerable extent, good; because he produced wheat in this way year after year for a considerable time. His plan, however, went out of use, and has not been practised for many years. Within the last four or five years, the Rev. Mr. Smith, who has a few acres of land, tolerably stiff, well provided with mineral ingredients, and tolerably absorbent, has been trying experiments of a similar nature. Has he succeeded, you will ask, in producing a crop without manure? He has—not without manure in the sense in which I use the word, but without manure in the sense in which you use it. He has not applied cart loads of dung to his land, but he has made use of plans by which he is enabled to obtain manure in a form in which you do not generally recognise it; and this is one of the great points I have to bring before you, to cause you to recognise that there are other sources of manure than cart loads of dung, straw, or guano. After having well-prepared the whole field by thorough digging and forking, Mr. Smith dibbles his wheat in rows three together, each one foot apart, and with a distance of three feet between every three rows of wheat. When the wheat is up, the one foot intervals between the wheat are repeatedly dug or turned by a fork about six inches wide, so as not to come nearer the wheat than three inches. Weeds are thus eradicated, and air admitted to the roots. The three feet intervals are treated throughout the spring and summer as *fallows*, and are thoroughly turned over in every direction, and well-exposed to the air. This is done up to the time when the wheat almost meets over the three feet spaces. When the crop is ripe it is cut, and the three feet *fallowed* intervals are now dibbled with wheat, while the part which bore the wheat is next year fallow. The last four or five years he has taken on an average from 30 to 34 bushels per acre from his land without the addition of any manure whatever, in the shape of guano or dung, or any other visible matter. He has been manuring, however, all the time; because, by his constant stirring, there has been a powerful absorption of materials from the air, nitre beds

have been formed, and and the result produced is the same as would follow from an absolute dressing of nitrate of soda. In cases where the soil has been light, and where the absorbent power does not exist so powerfully, he has used manure with, I believe, very fair success. He shows a profit of £4 or £5 an acre on his wheat every year. It is quite right to mention this, for his work has gone through many editions; he comes out every year with a fresh statement of what he has been doing, and he says that even at the low price of 40s. a quarter he makes a profit of £4 or £5 per acre. Upon lighter soils, as I have said, he is obliged to employ visible manures. It is clear that soils must differ in their powers of absorption. The heavier clays, for instance, have a greater power of absorption than lighter soils, and also contain more mineral matters; so that with these light soils manures are necessary. I have mentioned this case to you, because I want you, gentlemen, to tell your neighbours that manure comes from air on the one side and earth on the other, and that a proper working of the land, and a proper exposing of it to the air, will be very often as good as an absolute dressing of visible manure, because the invisible active ingredients of the air are absorbed by the soil to be made use of by the plant. If you go a little further, gentlemen, to the rotation of crops, you will find this principle distinctly acknowledged. The rotation, according to the Norfolk system, is turnips, barley, seeds, and wheat. Well, now, what is there in this that causes that rotation to do so well? You would say that, other things being equal, plants with large leaves would draw more from the air than plants with narrow leaves and small foliage. When the turnip is put into the ground it sends out great broad leaves; and when a nice breeze passes over them, and the sun shines upon them, there is a very great absorption of materials from the air, which the turnip eventually puts into the bulb for the purpose of producing turnip seed—that is the innocent purpose of the turnip. But the farmer says, "I don't want turnip seed; I want a little mutton and some barley." If he did not want mutton, he would plough up all the turnips, and put them into the ground to grow his barley. This material collected in the bulb for the production of seed, is partly consumed by sheep, and the rest is voided by them on the land. The barley is then sown. It has narrow leaves, and it could not absorb more from the air than would produce perhaps two or three quarters of barley per acre; but by using the turnip previously, which is better than fallowing, because you have a living agency as well as a dead one, a large amount of nutriment is placed in the ground, which the barley lays hold of, and there is a great increase in consequence. After barley, as preparatory for wheat, you take a plant with large foliage, red clover, or some other clover, which is mixed with grass seed. Now what does the clover do? Every little leaflet the clover sends up into the air, sends a rootlet downwards, so that in proportion to the upward growth of the clover is the downward growth of the root; and when you have taken the clover away you have got several tons per acre of valuable vegetable matter in the shape of roots, which, by its slow decomposition, affords nutriment for the narrow leafed wheat. So that by employing in the first instance turnips for the barley, and clover for the wheat, you have in the soil a large quantity of material absorbed from the air for the benefit of the narrow leafed crop. This may be clearly seen if you consider the difference between cutting clover and feeding it off. It is generally believed that a man who feeds his clover off with a little oilcake, &c., will get a better crop than if he takes the hay. I know I am on tender ground here, but I will say, though I know I am uttering a heresy, that the man who spends his money in oilcake, feeding that off upon clover, is committing an error, unless he can see a benefit in the shape of mutton. If you cut clover &c., at Midsummer and let it grow again and then take another cut in the autumn, you will have a far better crop of wheat than you would by all your feeding with oilcake, unless you choose to go to an enormous expense. I see some gentlemen shaking their heads. I shall be happy to hear any observations upon this point at the close of the lecture, and we shall then see whether my statement can be disproved. Every leaflet upwards has a rootlet downwards, and if the leaflet is taken off the rootlet will not grow, so that if the sheep be fed upon the surface the under production is decreased. In exact proportion to the increase of the upper is the increase of the lower; and if you are always feeding the upper off with sheep you will have but few roots below, and the little amount of nutriment you give in the shape of oilcake will produce little or no effect. A friend of mine tried this in Northamptonshire. He had a field of clover, which he divided into two parts; the whole was cut at Midsummer, half was left to grow again, and the other he fed off. In October he staked out two pieces as regularly as he could, and had all the roots dug up, and carefully cleaned and weighed; where the clover had been cut once and eaten once there were 25 cwt. of roots per acre, and where it was cut twice there were 75 cwt. per acre; being a difference of two tons of roots per acre. Who will say then, that two tons of vegetable matter containing so much nitrogen as these roots do, was not an exceedingly good dressing? Of course, the result in the wheat crops showed it immediately; and you may depend upon it that with one exception—namely, where soils are so light that the mechanical treading of the feet of sheep is a matter of prime necessity—you will always get a better crop of wheat after two cuts of clover than by feeding off. There is one point that I must mention with respect to turnips, because in order to get a clear notion of manuring we must attend to these little minutiæ. Many have a notion, I have found it general, that sheep and other animals have the power of imparting something to vegetable food, so as to convert it into manure. Gentlemen, it is no such thing. Whether the vegetable food has passed through the body of the animal, or passes at once into the soil, so that you can ensure a regular decomposition, the effect will be the same. Take the case of a crop of turnips. Suppose you took two pieces of land, each having 20 tons per acre, and in one instance you chop up the turnips and spread them on the land, and the other 20 tons you feed off with sheep, and then plough the whole and sow it with barley. I maintain that you would have a much

larger crop of barley where you did not feed the sheep than where you did—that where the turnips were by themselves cut up and ploughed into the land you would have much more nutriment adapted for the succeeding plant than where you fed the sheep upon it; because, while you feed the sheep it wants something to supply the natural waste of the body, and to increase in bulk, and after these are supplied by the turnips, the sheep sends into the soil a smaller quantity of vegetable matter to serve as manure than was contained in that which it originally fed upon. Where can a sheep derive manure from, except from its food? It has no power of deriving it from anywhere else, because the animal is only a consumer, it does not give anything. Therefore feeding is only a waste, unless you realise a benefit in regard to your stock, which I am happy to find you are all doing. I have known the time when turnips were so abundant that there was not stock enough to feed them off, and when they were ploughed into the land they produced better crops of barley in consequence. I applied to a number of my friends to try some experiments upon cases of this kind, and I have one or two letters here respecting those experiments, which, with your permission, I will read to you.

LETTER I.

Old Broad-street, Aug. 10, 1849.

MY DEAR SIR,—In reply to your letter, I am instructed to say that the members of the Farmers' Moon Club, in the neighbourhood of Rochester, Kent, unanimously agree that vegetable manures are peculiarly fructifying, and that, taking the case of a fallow or other field, being all previously of the same tilth, and sown with rape for feeding, and divided into three divisions, one of which shall be fed off with sheep without any extra food to the rape, the second division ploughed in, and the third division fed off with oilcake or corn; that the worst corn succeeding the rape will be on the first division, the next best on the second, and the best on the third. Thus all speak in favour of green crop for manure. Yours truly,

J. C. Nesbit, Esq. JOHN OAKLEY.

LETTER II.

Naseby, May 15, 1849.

MY DEAR SIR,—I regret I was not at home to answer your inquiry sooner, having been in Yorkshire the last fortnight; however, I hasten to send you the required information. In the spring of 1846 I had more turnips than my stock could consume; I therefore thought that it was reasonable that, if the crop was broken to pieces and ploughed in, the grain crop that followed would derive as much benefit as if eaten by sheep. I therefore did so with one acre on the first week in February, and with another upon the fourth week in March. Part of the rest of the field was eaten on the land, and part being newly ploughed up land, the whole crop was drawn off.

On the land where the turnips (white rounds) were broken and ploughed in on the last week in February, the produce was 84 bushels per acre of Hopetoun oats.

Where the turnips were broken and ploughed in on the fourth week in March, the produce was 74½ bushels per acre.

Where eaten on the land by sheep, 70¼ bushels per acre;

And on the newly ploughed up land, the whole of the crop drawn off, 41 bushels of wheat.

I am, yours faithfully,

J. C. Nesbit, Esq. PETER LOVE.

LETTER III.

Assington Moors, June 15, 1849.

DEAR SIR,—I have just seen Mr. Underwood, who was a neighbour of mine eighteen years ago, but is removed to a distance. He says he has practised ploughing in a few acres of turnips almost every year for upwards of twenty years, and considers three sacks of barley per acre quite within bounds, as the increase from ploughing in over feeding off. The clover is much better; but he has not observed the wheat sufficiently to say what the difference is. He estimates an average acre of white turnips to be worth 30s. more to chop and plough in, any time before they begin to run to seed (say February out), than to feed off.

I inspected a field of wheat this week, belonging to John Gurdon, Esq., which was white turnips three years back; a part was ploughed in, and the rest fed off with sheep, and half-a-pound of oilcake per day each given to them. The wheat, where the turnips were ploughed in, is decidedly better than the rest—I think three bushels per acre. Mr. Hudson, the steward, told me the barley was quite a foot higher than the rest of the field, and three sacks per acre, if not more, better. The clover was all fed off, and no notice taken; nor would anything more have been thought about it, had not the wheat looked so much better than the rest all the spring. The turnips were about three-quarters of a plant, but regular; the sheep went down with the epidemic, and were sold, leaving about two acres of turnips to feed; and rather than purchase any more stock they were ploughed in.

As I told you at the club, I am generally a buyer of turnips; but the obstinacy of my neighbour, Mr. Underwood, who refused to take 20s. per acre for his to feed off (for the sake of convenience to me) when almost everybody else were giving theirs away, attracted my attention to the after crop; and I can, in two instances, confirm his statements. Notwithstanding, if 1½ cwt. of swedes (I think a ton of Swede turnips will make 14lbs. of mutton, from experiments I have tried) or 2 cwt. of white turnips will make 1 lb. of mutton, and we can grow 21 tons of the former and 26 or 28 of the latter, it must be more profitable to feed 5d. per lb. for the mutton than to plough in to gain 30s. or 40s. per acre in the corn crop.

I have been unwell, and could not see the parties, or I should have answered your note before.

I am, dear Sir, very sincerely yours,

Mr. J. C. Nesbit. THOS. HAWKINS.

I do not quite agree with one part of the first letter. At all events, the distinct opinion of the farmers, in most parts where I have had this thing properly tried is, that the turnips or rape ploughed into the land is far better for the next crop than if fed off with the sheep, even with the addition of oilcake. You see, this brings us at once to green crops. Supposing you had a large farm, of a thousand or more acres, and could not stock it at once, one of the best means of bringing up the fertility of the land is to grow rape, or some material of that kind, and plough it in, because the rape derives from the atmosphere a very large amount of the volatile materials belonging to the atmosphere; and thus for the next crop you will have an abundant supply of manure in the land. That is the way wheat is grown in America. It is the plan of the growers there to sow clover and plough it in; then a wheat crop; and after the wheat they fallow it to clear from weeds for a year, and then put in clover again. They take wheat in this way every three years, and do nothing

else. They use clover simply for the purpose of obtaining nutriment from the air. Now, gentlemen, we come to the preparation of farm-yard manure, which is generally supposed to be formed of all the vegetable matters lying about the farm, together with any of the dung, and so on, which happens to be dropped about. Whether it is the mere vegetable matter itself, or whether it has passed through the animal, it is all the same. If I pass a certain quantity of food through the body of an animal, that animal is absorbing air continually into the system, which is continually acting upon that food, and consuming some of it, so that what it gives out afterwards is less in value than what it took in. If you take a quantity of straw to be trodden down by animals, and thus rotted away, the same action takes place as inside the animal, namely, the air is acting upon the straw, burning a portion of it, and giving out into the air carbonic acid, ammonia, and water, from the decomposition of the vegetable matter; so that whether you pass the food through the body of the animal, or decompose it in the open air, the ultimate result is the same. There is always a certain loss, which goes into the air for the general supply of nature's fields; the rest is left in the shape of manure. That which passes through the animal is richer than the ordinary farm-yard dung, because of the greater richness of the food upon which you feed the animal. If you fed the animal upon straw alone, its excrements would be no richer, as far as manure goes, than straw decomposed in the open air; but as you happen to feed the animal upon seed, which contains four or five times the amount of nitrogen—a substance capable of producing ammonia—than straw, and which contains far more phosphates, the excrements are more valuable than decomposed straw. In no other sense are the results different. If you took a quantity of wheat or linseed, and allowed it to rot, instead of feeding animals with it, the residue would be as valuable as that expelled from the animal. Therefore while you use valuable food, because you gain by the conversion of the food into beef or mutton, that which is excreted or given out is only valuable because you use a valuably material to produce it. Manure from animal matter, then, is the same as that from vegetable matter. Many animals live upon vegetables, and carnivorous animals live upon animals that live upon vegetables; so that whatever animal manure you use is really derived from the vegetable kingdom. Therefore with respect to farmyard dung, you simply return for the production of new vegetables that which formed part of the old vegetables. It is only putting on the land that which you have taken from it. In the management of farm-yard dung there are a few things worth noticing. Some of the constituents of farm-yard dung are volatile, and go into the air; others are soluble in water, passing away if there is too much water; and the most worthless are the least volatile and the most insoluble. Ammonia, one of the most valuable constituents of all manures, is that which is the most volatile, and if you allow too great heat in decomposition of vegetable manures the ammonia as it is produced is driven off into the air. Again—if, as is the case, I am afraid rather too much, even in this part of the country, you allow all the water that falls to go upon your manure, even that which comes from buildings and outhouses, you wash away all the soluble materials, and dung that has parted with these volatile and soluble materials is like so much green thatch, about as valuable, and produces no better results. If you want to buy ammonia in the commercial market you must give £50 a ton for it, or at that rate in any manure in which it is found; and if you want to buy phosphates and other materials of that kind, you must pay at a very high price for them; you should, therefore, be very careful to prevent this waste. One of the best ways to prevent the waste of ammonia, in cases where you cannot put your dung on the land at once, is to make compost heaps of it—in fact, nitre-beds. Why, I have seen to-day, while riding out near Driffield, a large quantity of dung without the slightest covering upon it. A great quantity of it has been exposed to rains which must have washed away ammonia, and nitre, and everything else in it that was useful. I asked the man why he did not lay it up, and put a layer of ditch stuff upon it. He said "Perhaps it might have done some good, Sir." But you know, he did not do it. (laughter) If he had put on it first a layer of road-stuff, of which there are hundreds of loads within a hundred yards of the field, on each side—if he had put some earthy matter upon it, he would have had a regular nitre-bed; he would have had a slow production of nitre; he would have had the whole of the earthy matter impregnated with gases, and would thus have had a much more valuable manure than the washed dung he is now putting on his land. This nitrifaction can be always carried on by you, gentlemen. There are times when you cannot put dung upon the land; and what are you to do then? The best thing is to use some calcareous matter—marl, or something of that kind, and lay the dung up in such a form that it can be mixed very well with it; turning it over once in two months. The earthy matter will prevent its being too light, and also prevent too great decomposition. It is your grand point to prevent decomposition going too far. You should allow it to go on slowly and regularly. There are many who like spit dung well rotted. If I were going to buy it at so much per ton I should buy probably that which had been rotted for some time; but if I made my own I should use it very differently. A hundred tons of new dung is certainly more valuable than a hundred tons of the same dung rotted down to fifty tons; but a ton of the fifty may be worth more than a ton of the hundred. Therefore I might be inclined, when using it for certain crops, to buy it at so much per ton; but I should not rot it down myself. In respect, therefore, of lands not over light, that would not be injured by long straw being put on, fresh dung answers better than the other; a hundred tons of fresh dung would do more good upon such land than a hundred tons of fresh dung wasted down to seventy, or sixty, or fifty tons by decomposition. I cannot too much impress upon you the necessity of preventing too great decomposition taking place, unless you put something to absorb the materials given out, so as to form something like nitre-beds. Farm-yard dung, as I told you before, essentially varies

in its value according to the substances from which it is made. If you have any box-feeding at all, if you feed your bullocks in boxes, you will follow Mr. Warnes's plan—if you feed with linseed and other strong food, the manure ought not to exposed to the wet, but should be stacked up—I was going to say, as you would stack up barley, or mixed with soil as before described. Some covering should always be over it; and if that is done in the way I have mentioned, calcareous matter being mixed with the manure, you could have manure which would act decidedly as strongly upon your land as any nitrate of soda you could use. There now comes a question as to the general application of farm-yard dung to different crops. I had better, in speaking of that, just mention that with respect to all lands there ought to be a certain amount of lime in them. Though you are living upon the Wolds, quite a lime-stone district, I must tell you I have known very good results arising from chalking upon chalk. In Hampshire, and various counties where the Downs have been exposed for years and years, I have taken some of the soil within a few inches of the top, and tested it for chalk, and have not found a trace—not a trace that a chemist could swear by—and having recommended gentlemen there to try to lime or chalk these Downs, which ever was best and cheapest, my recommendation was followed, and it was productive of an increase in the verdure. It does not follow that on the very surface of a chalk or limestone soil you should have chalk or limestone; there is a tendency in chalk and lime-stone to go downwards. A few years after a field has been limed, if you dig you will generally find a layer of the lime some inches below the surface. In some of the hop-fields in Kent, where the hops grow upon limestone rock, I have taken the surface of the soil, and have not found one part in a thousand of carbonate of lime. I recommend chalk, or limestone, therefore, upon soils known to be formed of limestone itself; because without a certain quantity of limestone in the soil comes in contact with the air you do not get the result that you otherwise would have in a properly porous soil. Let me say a word with respect to the application of farm-yard manure in general, before I come to the more artificial sources of manure. How should it be applied? Some apply it to wheat, some to grasses—some to one thing, and some to another. There has been a great dispute in our part of the country whether farmyard dung should be applied for wheat directly, in the autumn, or whether it should be applied upon the grasses. Many advocate the putting of this dung on the clover at midsummer; and in almost all cases where it has been so tried, it has produced a good effect. I carry that a little further, and instead of applying my farm-yard dung for the wheat, in ordinary cases, when the wheat is going to be sown, or on the clovers at Midsummer. I should apply it the autumn before, or the spring, upon the clover; because, you see, you will then have this effect, you will give the clovers a thorough good dressing, so as to enable them to grow with much greater rapidity and much greater volume; then you will have a far greater amount of roots produced in the clover, and the wheat will get a greater benefit from those roots, in the shape of manure, than if you applied the manure at midsummer, or when you plough up the ley in the autumn. Wherever this plan has been tried—and it has been tried in many cases—it has been found efficacious. Experiments have been tried, distinctly showing that it is preferable to apply farmyard dung to green crops, rather than to corn crops. Now, with respect to artificial manure, so called: there cannot be any properly so called; because, wherever manure comes from, we can trace it all back to the same natural sources. Bones are known in this district as very efficacious sources of manure. What are they, gentlemen? You get them from animals; animals live upon plants, and all the constituents of plants come from the earth and from the air. Then you have guano: where does guano come from? it is the deposit of sea-fowl; these sea-fowl feed upon fish; the fish feed upon vegetables in the ocean; the vegetables in the ocean under the light of the sun, feed upon mineral and other matters existing in the ocean; so that even Peruvian guano comes from vegetables. I have here a sample of dried flesh from Buenos Ayres. How is that produced? It comes from bullocks, of which many thousands are killed for the sake of their hides, which are sent to England. Thirty or forty thousand hides of these wild cattle are imported every year. These animals feed upon the prairies and pampas of South America, and they get flesh from the vegetables on which they feed. But the question is, which is the most valuable of these various manures? If you examine all those which are found practically to be productive of the greatest benefit, you will find that those which contain the most nitrogen or ammonia, and the most phosphate of lime, are those which prove of the greatest advantage to the farmer. Theoretically, we should say, manure was really perfect manure which contained every constituent that the plants might want. That would be theoretically a perfect manure, if you were going to grow plants upon a soil that contained nothing; but then if the soil contains certain ingredients, if it has a certain amount of silica, potash, soda, and other materials of that kind, which most of our soils in this country are invested with, in that case you will see that whatever the soil happens to be most deficient in will be most beneficial; and at the present moment experiment has proved, not only here, but in France, and in America, and in all countries with which I am acquainted, that those bodies which contain nitrogen, and those which contain phosphate of lime, are the most valuable for manure. Now, you know that do as you will, save your manure as you will, there is a constant loss upon your farm; that though you may, by proper working of the soil, get a very considerable amount absorbed by the air, yet there is always a loss—that there are few instances in which sufficient manure can be produced with ordinary farming without importing some. I assert generally, that unless you import phosphates and nitrogen, your farms, as far as the experience of all agriculturists go, cannot be much benefited. Potash and soda have been used in large quantities, but without any general or long-continued distinct effect, except

so far as salt goes, of which I shall speak hereafter. We have had silicates of soda, and a great variety of things besides, but only those I have spoken of seemed to be generally productive of good effects throughout the kingdom. Well, now, in treating of manuring, we must take the separate crops, beginning with the turnips, and see what are the best manures for them. I think, as far as all experience has gone, bones have been found in this part of the country, and in almost every other, to be one of the best manures for turnips; but then you have had to put on a large quantity of bones per acre, and after you have taken your turnip crops you have found a great deal of bone left which has evidently exerted no action at all. It was due to the celebrated Liebig to suggest, that if these bones were made more soluble their action would be quicker, and the expense to the farmer would be less. He suggested that they should be made soluble in a manner well known to chemists. Bones can be made soluble in a variety of ways; and the method that has been known for 50 or 60 years—namely, that by sulphuric acid—was the one suggested by Liebig. He proposed that sulphuric acid should be applied to these bones, so as to dissolve a portion of the lime, and set the phosphoric acid free. This has been generally done, and I believe there has not been a suggestion in chemical science which has been productive of such immense advantages to agriculture as this simple suggestion of Liebig's; because instead of your throwing a quantity of bones upon the land, which apparently are very good for the landlord—I say apparently because he sees the bones are there—you put in just as much as the crop requires, and not a farthing's worth more. It ill accords with my notion of what farming in the present day should be, that a man should go and put a sufficient quantity of manure upon his land to last for nine or ten years, so that he loses the interest of his money the whole of the time. As well might a man go and put £10,000 into the Bank, and keep it there for ten years, simply because he might want to spend a thousand a year—thereby losing his interest of £500 a year during the whole period. The introduction of artificial manure has brought about a different phase in the art of farming. Many cotton manufactures, we know, turn their money every two or three weeks, and they are excessively careful not to put out a penny that they cannot get something upon; and I would point out to you, that if you go on with the old system, when you have the means of determining exactly how much manure you require, you are only wasting your capital and losing your interest, if you put on your land more than it absolutely wants. You can grow any crops you like by attending to this matter. Is it not foolish to go and administer to land as much as would suffice for three, or four, or five crops, when the land is subject to all the vicissitudes of a rainy season like the last, when almost everything soluble must have been washed out of it? Instead of a quarter, or a quarter and a half of bones being necessary, as before, a few bushels, acted on by a third of their weight of acid, and rendered soluble, will produce not only an equal but a better crop, and some effect may even be produced in subsequent years. I do not say that you will see it in the next turnip crop, because that would be advocating a thing which I think ought not be countenanced—putting in more than you really want. You are not always obliged to feed your turnips off upon the land, but you may want them at home in some instances. If your barley in the spring does not look as satisfactory as it ought, you can now remedy it, while before you used to be obliged to leave it to its fate. A little guano or nitrate of soda and salt—three quarters of a hundred-weight of nitrate of soda, and four hundred-weight of common salt—for either wheat or barley looking badly in the spring, will produce an immediate effect. You will find, particularly upon your hilly districts, that a great quantity of land not hitherto cultivated, or cultivated with difficulty, for turnips, in consequence of the immense expense of carrying farm-yard dung, can be brought by these artificial manures into a perfect state of cultivation; and I need not tell you, that if you get 20 tons of turnips per acre, your cultivation for the next four years will be pretty well established. In Wiltshire and other places in the South, the introduction of these portable manures has been the perfect salvation of the country. Farmers in that district, with whom I am well acquainted, have been paying high rents for all lowlands—smaller rents, it is true, for the highlands, but put together their rental has been considerable; the hills there are rather more abrupt than the ordinary run of hills in this neighbourhood, and they were found exceedingly difficult, indeed almost impossible, to cultivate; but since the introduction of portable manures, by the application of super-phosphates, or manures of that kind, to the hill land, they have been enabled to get a great quantity of turnips, with which they have fed an increased stock of sheep. I have not heard any grumbling from them for the last three or four years; they have been doing well by their stock; and if you, gentlemen, can grow more food for your stock, and keep more stock—I am sorry to say we are paying 10d. a pound for mutton chops in London—if you can manage to keep an increased quantity of sheep, and sell the stock at present prices, and wool at 17d. or 18d. per lb., I think the cry we have had about the fall of British agriculture will prove to have been perfectly unfounded. I believe I have given you a pretty clear notion of what are the best manures for these crops I may say, generally speaking, that for wheat these manures are the best which contain ammonia or nitrogen, with a certain amount of phosphates. These must be applied carefully, because there is a liability to throw down the wheat; and in order to prevent that I must recommend you to use salt. Salt is not a thing which shows itself evidently in the production of a large luxuriance, but does in keeping the stem of the wheat standing. In Lincolnshire you will rarely find the wheat falling on the salt marshes. Two cwt. of guano and 4 cwt. of salt is a good dressing for an acre of wheat. With respect to grass land, according to the experiments of Professor Kuhlmann, the amount of grass produced on any given acre is in direct proportion to

the amount of ammonia and nitrogen used. In reference to that and clover, you have not much need to fear too luxuriant a crop. The more you apply of those manures which contain nitrogen the greater will be the production of vegetation. Professor Kuhlmann applied gas-water, nitrate of soda, ammonia, dissolved bones, and a great many other things to grass land; and he found as the result of these experiments, having ascertained previously by analysis the amount of nitrogen in them, that the increase of the crop was precisely in proportion to the amount of nitrogen in the manure. He tried the experiment for two or three years; he took not only the first crop, but the second; he cut it, and found the same thing there—found the same increase relatively as in the other. I have had experiments tried on the Downs in Dorsetshire, with ammoniacal manures, and I have found the production of grass has been largely increased by ammoniacal manures. I mention these things, because you will have to turn your attention a little more to science than you have done, so as to know the nature of the manures which you are using. Now let me say a word with respect to the adulteration of manures. Good guano ought to contain 16 or 17 per cent. of ammonia, and 25 to 30 per cent. of phosphate of lime. I am speaking of Peruvian guano. There are many other guanos that are brought into this country, and I will just tell you what they are selling at. Guanos of which I have had scores under my analysis I have seen selling in the market at £8 and £9 per ton, but they are not worth to you a-third of that amount. I wish to warn you, that if you buy guano, except from the best sources, it is a thousand to one but you are cheated—as many persons, I fear, will know this summer. It is far better for you to give your orders for manure before Christmas than after, because there is then nearly always an uncertainty about it. The ships may not come in, and if the importers know what demand is likely to be made, they will better be able to meet it. Adulterations of guano are going on to a very extraordinary extent. I happened to be in Newcastle the other day; and I can assure you there is a regular establishment there, for the purpose of importing into your neighbourhood, Hull, Stockton, and other places, regularly adulterated articles to the extent of thousands of tons. They are sent by all means that men can devise to prevent their trickery being known—sent in all directions, flavoured with a little genuine guano, which they get by means of some trickery. The adulterated article is bought up by farmers who like to buy a little under market-price. The consequence is, that they get thoroughly cheated. Every farmer, in fact, who tries to buy cheap manure is sure to be deceived; because if he will have it cheap people will be found to make it at his price, and he will have to pay the cost of mixing, and probably 50 per cent besides. If manures are worth using at all, they are worth a proper price. Manures of the lowest price are the least valuable to the farmer. If he could get manure worth £50 a ton it would be more valuable to him than Peruvian guano, because of the saving of carriage, and other facilities, arising from its small bulk. You cannot, therefore, be too careful in purchasing these manures. I am, myself, extensively engaged at the College in the analyses of manures, and at a moderate charge shall be very happy to render any assistance to the farmer, in letting him know the quality of manures. Let me advise you to deal with none but men of established character and integrity, whom you know; and do not try to buy everything cheap, for it is certain you will be cheated if you do. The quantity of adulterated guano made this year, I should think, will not be less than twenty or thirty thousand tons, and I should say that the amount out of which the farmer will be cheated may be estimated at £100,000. Now, genlemen, I am afraid I have taken up too much of your time with the subject mattter of my lecture, which, in fact, is a great deal more than can well be introduced in the short period that I have had allowed me. I feel much gratified by your kind attention, and I shall be happy to answer any questions that may be put to me, or to offer any explanations respecting anything I have said.

The CHAIRMAN.—You have mentioned some startling facts with regard to mowing clover. There is one question I wish to ask you. If you had a piece of land that you wished to occupy for some length of time, and you wanted to improve it permanently, would you mow two crops of clover, or pasture the second crop with plenty of oil-cake?

Mr. NESBIT.—I should mow it.

The CHAIRMAN.—Even for permanent improvement?

Mr. NESBIT.—Yes, distinctly. I think there would be more nutriment left in the land than by ordinary feeding. I am not speaking theoretically only, but from practice which I have known carried out. There are only a few places where the plan does not answer, as in some of the light lands in Norfolk, where the land would be made too light by the great size of the roots. In all other cases I have found mowing the two crops do better than feeding off one.

The CHAIRMAN.—You have spoken of the four course system of farming as adopted in Norfolk, and, I believe, in many other places. Our lands, however, tire very much of clover.

Mr. NESBIT.—You can try other grasses.

CHAIRMAN.—They have been tried, but they are not very satisfactory.

Mr. NESBIT.—You could try two years instead of one, having a five course instead of four.

The CHAIRMAN.—That has been tried, and sometimes a seven or eight course, and, I believe, with good effect.

Mr. DAWSON asked whether it was now too late to use salt, as recommended by Mr. Nesbit, and, if not, how much should be applied.

Mr. NESBIT said it was not too late in the season, and that the quantity applied should be 4 or 5 cwt. per acre. They must not expect, however, to see an immediate and palpable result from the action of salt. A deputation from France, consisting of M. Dumas and four or five others, came to England about five years ago to make inquiries respecting the action of salt. They returned, however, to their own country, and made a report in

which they said they could obtain no certain knowledge about it; while at the same time there were hundreds of people in the kingdom who knew what its action was; but there was such a diversity of opinion among the farmers' clubs on the subject that they could not obtain the information they desired. The action of salt was to neutralize manures for a time, not to give them greater effect. Salt, indeed, applied in sufficient quantities, would kill all vegetation. When the wheat was likely to go down, salt was useful in stopping the luxuriance of the straw, and in making it yellow, strong, and firm; and the bushel of wheat or barley would weigh much heavier. These were the results in ninety-nine cases out of a hundred.

Mr. DAWSON.—You would not use salt on anything that did not look luxuriant?

Mr. NESBIT.—A little would do no harm.

The CHAIRMAN expressed an opinion that manure was best applied to green crops.

Mr. NESBIT said he thought farmers had kept too much to the drill system in manuring their lands. When the land was prepared for turnips by the addition of a good quantity of farmyard dung, there could be no objection to the use of super-phosphate or dissolved bones by drilling, because the action of the super-phosphate was to stimulate the plant. Where, however, the land was not in a prime condition, if a turnip was taken by the neck out of the ground, all the roots would be found running in the direction of the drill, showing that in all other directions there had been a want of manure in the soil. When lecturing at Dorchester he (Mr. Nesbit) pointed out this fact, and advised the gentlemen there to use 2 cwt. of guano per acre, broadcast, and then drill with superphosphates, or put on 3 cwt. superphosphate, broad-cast, and then drill with 1 cwt. A gentleman afterwards offered a prize for the best 40 acres of swedes in the county. One of the competitors followed his (Mr. Nesbit's) suggestion, and won the prize; and at the last dinner he had given him (Mr. Nesbit) the credit of it. He mentioned this circumstance because he was quite satisfied that it was not the best way to get a good crop to drill all the manure, a certain portion ought always to be harrowed in. If there was not sufficient farmyard dung for the turnips, some other manure should be used, and be well disseminated through the whole soil. The same remarks applied to mangel wurzel.

The CHAIRMAN.—We do not grow much in this neighbourhood.

Mr. NESBIT thought it could be grown in the neighbourhood very well. It would require, however, double or treble the amount of manure used for turnips; it was necessary also to plough deeper, to have the land in good tilth, and to sow early in the spring. He knew of no plant that turned out so well, with good nitrogenous manures, as mangel wurzel. Forty tons per acre might be obtained; and in the spring it was excellent food when turnips could no longer be had.

Mr. KEMP asked if the lecturer thought 2 cwt. of superphosphate per acre would be sufficient for turnips.

Mr. NESBIT thought it would not be sufficient unless the land was kept in good condition by farmyard dung.

A vote of thanks was then unanimously accorded to the lecturer.

Mr. NESBIT briefly acknowledged the compliment, and expressed a hope that he should have the pleasure of hearing that some good had resulted from the suggestions he had thrown out.

The proceedings then terminated.

IMPROVEMENT OF GRASS LANDS.

If we were asked our opinion on the state of the vast mass of second and third-rate grass lands in the kingdom, we should certainly be inclined to think they are getting annually poorer. The chemical discoveries are all applied to the growth of green crops, and, of course, the researches are all made on clover and rape, on turnips and wheat, on beans and potatoes. The only answer the inquirer gets about his grass land, if it is poor and not very productive, is, "Oh! plough it out." But he can neither do so in accordance with the stipulations of his agreement, nor the custom of the country; and here (south of the Tweed), at least, we think it is better to have a certain portion of old grass land. But if it is to be the subject of universal neglect; if it is to be only used simply as so much land on which stock may run, or live, or die, at pleasure, a moment's abstract consideration of the way in which inferior grass land is annually depleted, even on farms where other crops are well-cultivated, will convince the most obtuse that the result could not be different. They are by universal consent the favourite food of the rearing and breeding stock of the establishment—of the ewes giving suck—of the growing lambs— of the cows producing cheese and milk—of the draught horses, and of the young cattle—and all these are annually taking off nitrogen and phosphoric acid which never more meet the rootlets of the plants which have produced them; and hence the plants starve—the grasses grow thin—the finer grasses disappear altogether —and moss takes the place of these articles of food, to cover the ground at least with something.

A little closer observation will convince also that this is just going back to first principles. Moss is the first plant which grows upon the newly-formed soils, and even upon the rocks themselves ere the soil has begun to form, and it is nature's first preparative for the operation of soil-making wherein to grow a succession of future plants. Hence the

moss asserts its dominion in pastures only when they are too poor for the grasses, and is an *effect* rather than a *cause* of barrenness.

How then are we to cure this unproductive state of our inferior pasture land, called by many provincial writers by the expressive, if not very elegant, term of "hide-bound" grass land—a term we see applied to it by the intelligent men who compose the Newcastle Farmers' Club, and who at a recent meeting discussed the various remedies suggested for the cure of this state of the soil. Mr. Weeks, the first speaker, recommended harrowing the surface, which brought up the mosses, scarified the surface, and improved the pasture. That opening, stirring, and scarifying the surface will be beneficial there can be no doubt. The new surface will have a tendency to appropriate ammonia and to promote decay of the inert particles of vegetable matter always accumulating in grass lands; but, as Mr. Wecks suggested, something begond mere scarification is necessary. An old friend of ours, who sometimes favours us with an article—the reminiscences of his past days, as "A retired Practical Farmer"—much improved his grass land, *inter alia*, by harrowing, top-dressing with light composts, and sowing new and suitable grass seeds. To the latter we believe he attached the most importance; but we must confess, for we saw his farm during the operation, we attributed the improvement more to the small composts he put on, encouraging the finer grasses, than to any seeds he might sow; and, unscientific as we fear it may by some of our readers be considered, we have more faith in a high state of cultivation in the land than to any selection of seeds whatever—how well chosen they may be or soever costly.

We know it as a fact, though we pretend not to assign the cause, that the moment you get a soil into high cultivation you can no more *prevent* good grasses growing than you can weeds in a soil in a bad state of cultivation. Mr. Taylor, at the Newcastle meeting, preferred the paring and burning of a bad soil as an improvement for hide-bound grass land, and the subsequent sowing of seeds; but, he said, "Some land belonging to a neighbour of mine was pared and burnt, and left just as it was —*no seeds being sown*—the grass came to the surface, and there was a better crop than had been known on the land for years." We stop not to argue from this case most decidedly in point, whether the seeds were in the soil or in the air—for seeds there must have been—any more than we try to account for white clover growing where it was never seen before, after a dressing of mountain lime or half-inch bones, as thousands of acres on the western ridges of the island and the pastures of Cheshire can prove.

We think the real cure of hide-bound land is increasing its fertility; and the more this is pursued the better will be the grasses. As the best grasses die off year by year where the land is becoming poorer, and the large and coarser plants supply their place, the mosses following in the interstices between them, so an application of powerful means will cause a vigorous growth of the best grasses, that they will eat-out and overgrow all the inferior kind—fertility being thus the standard of the kind of grass you may wish for and expect to be produced.

Perhaps the most lasting improver of all soils —not really clay—encouraging the best grasses, and growing these in luxuriance and abundance, is a dressing of half-inch bones. This the land seems never to forget; but it is wholly or partially a landlord's, and not a tenant's, operation. It is also slow in its operations. But the same may be instantaneously produced by a dressing of dissolved bones followed by one of guano. Let the former be applied in February, the latter in the April following—both immediately, if possible, before rain—and the most wonderful change will take place not only in the quantity, but also in the quality of the grass. Six to eight bushels of the former, and three to four hundred-weight of the latter, may be necessary if the land is very poor; but, under the most unfavourable circumstances, it is a dressing it will never forget.

We observe Mr. Wecks, in his advice to the farmers of Newcastle, advocated nitrate of soda and bones to be used for improvement; and this we imagine is but another form of the recommendation above—being a combination of the nitrogenous with the phosphatic manures.

IMPROVEMENTS IN TREATING SEWAGE WATERS AND MATTERS.—Patent dated January 5, 1853.—William Bardwell, of 4, Great Queen Street, Westminster, Middlesex.—This invention consists in constructing a building, having at its basement or ground-floor a filter bed within a close chamber, into which the sewage waters and matters flow from the sewers. From the floor or filter-bed within this chamber are suspended trays or shelves, covered with sawdust, or other matters, moistened with dilute sulphuric acid. The floor or filter-bed is supported by beams or bearers of iron coated with zinc; and in order to obtain the pressure of the atmosphere upon the matter on the filter-bed, the underpart of the filter is so arranged that the air may be withdrawn by means of air-pumps, or otherwise. The floor on the top of the filter-bed is to be of some strong perforated substance, as iron or zinc, that it may bear the matters shovelled upon it. Below this is arranged strata or filtering media, through which the water passes, leaving the solid matter behind it. This is to be thrown, or otherwise raised on to a floor above, and there mixed with other matters suitable for making manures; and it will be convenient to have a third floor above, for keeping a supply of such matters, as are to be mixed with the sewage waters before they are led away through channels appropriated to the purpose.

OUR LABOUR MARKET.

(Concluded from page 206.)

Progress in chemical and mechanical science, so as to obtain cheap manure and machine labour, is a work of time, and cannot be jumped into, on an hour's notice, by either landlord or tenant. Were the patent office, for instance, to grant patents for a nominal sum (as 5s.) to-morrow, and were a thousand patentees to appear in the field with their respective propositions all reduced to practice—five hundred chemicals we shall suppose, for the sake of perspicuity, and five hundred mechanicals, and all having less or more merit—farmers require time to test their comparative values. Manures, for instance, must be applied to the different crops grown on different soils and under different rotations, in order to test their fertilizing powers; and, while this is being done, new discoveries and improvements are being made.

Of the numerous reaping machines, again, which appeared at the Gloucester meeting, only six were selected for more perfect trial subsequently; and had there been ten times the number of competitors, the result might have been the same, but the work of selection in all probability more difficult, while the greater diversity would have given rise to or suggested greater improvements, so as probably to supersede the six of greater merit before many weeks were over. The same may be said of other machines, time being necessary to test their value; and when this is done, each is, in all probability, very imperfect in its mechanism. The reaping machine, for instance, is obviously as yet far from being brought to its highest degree of perfection; so much so, that not a few condemn it, in its present state, as unworthy of further trial. Should wages, however, rise to 10s. 6d. per day in harvest, and labourers not be found at that money, such parties may soon change their opinions. But although it must be granted that time is thus necessary, yet it is manifest that the longer we are in commencing to adopt the impending changes before us, the sooner will be the transition or the greater the loss; and these are not the times when landlords and tenants can put off the progress of chemical and mechanical science to "a more convenient season," or brand with theorism an humble attempt to delineate the road before them. The wise maxim, "To look before you leap," must never be lost sight of, in adopting changes for counteracting the present emigration movement; for, according to another old saying, imperfectly executed work requires to be done over again, costing thus two expenses, and is seldom right after all." Success demands caution as well as timely perseverance.

Among the favourite propositions enunciated for counteracting emigration is that of building cottages and gardens for farm labourers contiguous to their work. Hitherto, in England, they have too frequently resided in badly constructed and imperfectly drained hovels in crowded villages, enveloped during summer and winter in pestilential vapours, situated miles from their work, so that the hard-working men had not only to drudge this distance morning before work, returning in the and evening to an unhealthy house, but also to sit down at the hedge-side and partake of a cold diet apart from the other members of his family twice every day, entailing upon him many evils. First, we have the expense of cooking two breakfasts and two dinners, and the thriftless, graceless, and improvident domestic habits to which the practice has given rise; then follow the village alehouse, and the many snares cunningly laid by its landlord and his dupes to catch the hard-earned wages of the labourer. We have often blushed to have it said, when in the north, that our English labourers "sit down to their meals like the brutes that perish"—"spend their evenings and Sundays in the alehouse and bed." Were a father to enter his cottage three times a day, seat himself in his own chair with his family at breakfast, dinner, and supper, and with uplift hands ask a blessing of his Maker at each meal, what is the effect which it would have upon the hearts of his wife and children? Now such is the practice in Scotland generally speaking, where the village system is almost unknown, and where farm labourers have cottages on the farm at a short distance from the farmery, with gardens attached. Hence the early impressions left upon the minds of the peasantry, which time can never efface in all the varied climes to which their enterprising spirit leads them. It is not because the English labourer is naturally more addicted to drink than his northern neighbour that he visits the alehouse, for the contrary is notorious, but because he has been brought up under all the poisonous influences of the village system. When a boy, if he had the good fortune to attend school, his leisure hours, morning, noon, and night, were spent in all the devilry which mischievous boys concoct. His father he only sees at night, and then either at the alehouse or lounging at home, too churlish to exercise successfully the parental rod; and perhaps as often not at all, because he is gone to bed long before he thinks of concluding the sport of the evening, or not returned from the alehouse. Hence the early impressions left upon his mind, corrupting his after-life. From this there is many a praiseworthy exception in almost every village, we hope; but such is too commonly the case. Such then is the general characteristics of the village system, and such the characteristics of the cottage; and the sooner that English landlords put an end to the former, the sooner will they study their own interest and that of their country, to say nothing of Christian duty and responsibility to the hard-working man.

The question as to the propriety of building cottages and gardens is therefore easily disposed of; but it is no sooner done than another—the most important of the

two, because the grand question at issue—demands solution, viz., Will cottages and gardens counteract the tide of emigration so as to retain a sufficiency of labourers at home? Nothing can be more childish than to entertain the idea of its doing so: but let us give the question a more practical answer, and in order to do so, let us proceed northwards to Scotland, where the cottage system prevails, when the question then resolves itself into this: Has the cottage system prevented the Scottish peasantry from emigrating? Quite the reverse; for they are far more inclined to emigrate than either the English or Irish, and the cottage system and parochial school system have, together, been the cause of it. Had they been brought up in a village with its alehouse as their only schoolmaster, their mental faculties would have been so blunted, that they could never have seen through the impenetrable halo which so long eclipsed the many blessings of colonial life from their southern and western neighbours. In proof of this, we may mention an instance: A highland landlord preceding the schoolmaster, proposed to give the inhabitants of a small "hamlet" who rented land of him, but who paid no rent, a free passage to America. "Oh, but," said they, "we hear there are black men and snakes in the woods!" "The black people," said their landlord, "are peaceable; and as for the snakes, you can kill them as you kill adders at home." At which the ignorant villagers muttered to one another that "he does not deny it: what he wants is our land for the Saxon!" and then sceptically returned for a final answer—"The adders of Strath— we know; but American snakes and savages the Lord preserve us from!" But where the schoolmaster and Bible had done their work in the cottage, the retirement of rural life, and the happiness enjoyed around the family altar, prepared the hard-working man and his family for all the seclusion of the "bush." What was their greatest blessing at home, they were confident of enjoying in the most retired depths of a colony. It was ignorance, and our village system with its cowardly associations and prejudices, from living in gossiping communities, which hitherto counteracted emigration; and therefore, to place our labourers in cottages after the Scotch fashion, is to make them experimentally appreciate the blessings of family retirement at home, preparing them thus for that of a colony.

Before returning from Scotland—so to speak—another question requires to be answered, If the cottage system will not save her landlords and tenants in the emergency before them, what will? If their labourers are emigrating faster than they increase in numbers, leaving cottages empty, so that at the expiration of some ten years hence more than the one-half may be unoccupied, how are they to cultivate their farms? To increase their labourers' wages to the colonial level, making the necessary allowance for cheap provisions, and the settlement of their families is absolutely impossible, with their present rents and taxes: so that the tide of emigration cannot be counteracted by an increase of wages without a reduction of these, while these exceed the rent. It must consequently continue to flow, until English farmers are left as American farmers were left under the "brute-animal system"—to work their own farms themselves, with their own teams! This also is absurd, for before doing so they will "bundle and go" for the "diggings," or more probably *cheap lands* of a colony, leaving landlords to do with their estates as best they may. "A good tale cannot be too often told," it is said; and therefore we repeat the only alternative left them—that of *improved manures and machinery*. "Necessity is the mother of inventions," and Scotch landlords, tenants, implement-makers, and manure manufacturers must just exert their chemical and mechanical ingenuity, and invent new manures, so as to make "two plants grow where only one grew before;" and steam-ploughs, so that one man and an engine may do the work of four ploughmen and eight horses, or more, if required; by which a saving of some 75 per cent. on the expense of cottages would be effected on the part of the landlord, while the tenant would have his work better done, and at not more expense. In such we can perceive safety for both parties, but in nothing else. By machinery we see how they may abridge labour; and by manure, draining, &c., &c., how the interest of the increase of capital thus invested may be paid. No doubt until steam-ploughs and manures are actually in operation, there are minds so sceptical and devoid of chemical and mechanical ingenuity as to ridicule the proposition thus enunciated as mere theory, because it has no connexion with their own notions of practice. But what is the force of the argument? Simply, nothing: for invaluable as the maxim of "science with practice," or "applied science," may be, yet when obstacles are thrown in the way of inventors or science reducing propositions to practice, the value of such a maxim falls to the ground. We have heard steam engines and railway engines ranked among "useless machines" in the class-room of an university before now, and learned professors in a few years afterwards declare that such mechanical agents had enabled our manufacturing and commercial interests to triumph over all their difficulties. But for them they had sunk in irreparable ruin: and why should it be otherwise with agriculture? The days, doubtless, were, when the brute labour systems of our colonies left the English inventor no alternative, it may be, but either to starve or throw his inventions unprotected into the lap of self-interested capitalists. But those days are happily gone; for the more fertile and extensive fields of our colonies, under their diversified climates, *with free trade* at home, demand more loudly his ingenuity and labours than the overcrowded and limited area of the mother country, whose inferior climate is only adapted for the growth of a few of the coarsest of Nature's productions.

It has been estimated by professors at our universities, that only 10 per cent. of the number of students in their class-rooms comprehend the mathematical and mechanical sciences, while not more than 5 per cent. comprehend chemistry; so that of every hundred farmers who have got a good education, we cannot suppose that more than ninety are able to cross "*the bridge of asses.*" Of every hundred, ten are only qualified to pass

the "*keystone.*" Hence the obvious conclusion *that the progress of chemical and mechanical science ought not to be counteracted by measures based on general opinion.* The theories of the ten and five who comprehend the mechanical and chemical sciences have no right to be condemned by the prejudices of the ninety and ninety-five; much less ought their labours in any chemical and mechanical emergency to be subject to a bondage tax, in magnitude such as to exclude three-fourths of their number ever being employed! Self-interest on the part of the public, to say nothing of equity towards them, obviously demands a different line of policy. *To exclude the labour of the inventor from the labour market, when his labours are in the greatest demand, is absurd beyond comparison*; let those who have never crossed "the bridge of asses" say what they may to the contrary.

But although cottages, as proposed, will not counteract the tide of emigration, so as to place English landlords in a more favourable position than that in which their northern neighbours are now in, yet the cottage-theory is a sound one, and that which they have got to consider is, what the progress of chemical and mechanical science demands. If chemistry and mechanics will enable them to accommodate a sufficiency of labourers with only one cottage for every two which the present comparatively "brute labour system" requires, it is surely for their interest to listen to the counsel which they give. To save £50 for every hundred acres of arable land in England is no inconsiderate item in any economical point of view, for 20,000,000 arable acres would just give a total saving of £10,000,000—a sum rather under the mark than above it; for we have no hesitation in saying that were those sciences freed from the shackles of an antiquated patent law, they would save more to English landlords than this sum, on cottages alone, to say nothing of the abridgment of labour by machinery and increase of produce from manure. Were home wages to rise to the colonial level, the increase would exceed £30,000,000 annually for England alone. It has been estimated that were the landlords and tenants of the united kingdoms of Great Britain and Ireland to pay the wages of America, the increase would exceed £45,000,000 annually! and that without any increase of investment beyond the present rate; while it has already been admitted that more capital must be invested in the permanent improvement of the soil. Hence the conclusion. On the other hand, although ignorance and our village system have, with a chain as enslaving as that of slavery itself, bound an unfortunate peasantry to their native parishes, yet the "schoolmaster abroad" will most unquestionably empty our poor-houses, ale-houses, and even the "village church" itself, leaving the village empty, like the chrysalis of the caterpillar after it has been metamorphosed into a perfect butterfly, enjoying the blessings of a more elevated life. There is no use of entering further into the details of the argument with the schoolmaster, for doubtless he will sooner and more easily metamorphose our grovelling, crawling, and consuming peasantry into very important colonial landed gentry with villages than with cottages—consequently cottages must be built. Now, when we consider that landlords and tenants have only two alternatives before them—that the one of these involves an increase of wages to the extent of £50,000,000 annually, besides a large investment in cottages, and that the other—the manure and machinery theory already noticed—would effect a saving of all this increase of wages, and £10,000,000 on cottages besides, it will readily be perceived from these pecuniary views of the subject, that, although we have dwelt at some length on the labour of the ingenious chemist and mechanic, yet the grand question at issue is not theirs, but that of the landlord and tenant; for provision must be made for them as for other labourers, or a colony will be the result; and something more than the ploughman's cottage of the north will be required to ensure progress in agricultural chemistry and mechanics. The erection, therefore, of the necessary number and quality of cottages and gardens which an improved system of agriculture demands is a very important work, affording England an opportunity of getting ahead of her northern sister, and occupying that place which she ought to do in the management of her agricultural labourers, whose menial rusticity has hitherto been the disgrace of her provinces. About two centuries ago Scotland was behind her, the "hamlet" system of the north being ten-fold more rude; but with the exception of the northern isles, where "Arcadian towns" still exist, her provinces now exhibit the cottage system, about one-fourth of the agricultural population having disappeared, making the necessary allowance for the increase of arable lands. Ireland is now undergoing a similar state of metamorphosis; while the rural provinces of England are about to start on a new era of their existence, metamorphosing their plodding serfs, or "brute animals," into artizans of the highest order. The observations of the Earl of Harrowby, at the Gloucester meeting dinner, were conclusive on this point.

The building of cottages and abridgment of labour by machinery will not only cause a revolution in the labour market—elevating the quality of labour, overthrowing villages, and thus affecting the interest of their proprietors—but it will also give rise to a more artificial system of husbandry generally, the mode of cropping as well as the mode of labouring being changed. Farmers will no longer have to depend upon labourers from Ireland, the Highlands of Scotland, and their own poor-houses and villages, to do their harvest work; for they will have to keep upon their farms what hands they require at all seasons of the year—our surplus labourers, who used to dun our ears for jobs from these sources, having left us; consequently, they will have to think in seed time how they are to reap and carry in harvest. In short, the whole labours of the year will have to be so arranged that a few labourers can perform them in succession with machinery.

From these observations, it will readily be perceived that the state of our labour market demands immediate and serious consideration of landlords and tenants—parties, unfortunately, not the best qualified and most disposed for such an undertaking, generally speaking,

the majority of them, we fear, being sticklers to antiquated things. The new-fangled notions of the ten scientific of them, however, can no longer be repudiated by the ninety non-scientific with safety; for impoverished land requires more labour than the fertile, and the "brute animal system" than the mechanical. Our colonies will soon prove this to their experience, were the United Kingdom to be silent; for a colonist with a plough in the prairies of America cultivates more land and harvests more corn than twenty Irishmen with a *loi* in Tipperary; and were the American to mature the steam plough, the odds would be still more against us. Chemistry and mechanics, therefore, must progress, or British agriculture will sink in the mire; and there is no time to be lost to avoid such an emergency, if we intend to maintain our supremacy.

AUTUMN CULTURE.

I always consider the month immediately subsequent to harvest one of the busiest and most important in the year: there is so much to be done—stacks to finish and trim, turnips and other late green crops to hoe and weed, stubbles to mow and rake and stack, to harrow or break up with broadshares or similar processes, bean and pea lands to be tilled and worked, potatoes to be taken up (harvested), winter tares to be sown, lime to be carted, yards to be cleared, cloverseed crops to be mown and carted, roads and fences to be repaired, drains to be cleansed, besides many smaller jobs of all kinds usual on farms and in farmeries. In the grazing department it is the transition month for all kinds of stock. Fattening cattle must be put into good eddishes or aftermaths, sheep on the best clovers; hoggets must be well provided for, either on eddishes, clovers, or good laid-in grass pastures; ewes must be selected for breeding, and the draft ones placed on good keeping; the breeding ewes and shearlings to remain on the old pastures, or turned into stubbles as weeders; the grazing steers and young cattle to keep on the roughest old pasturage, and all will at this season require the greatest attention, because their well-doing in the winter solely depends upon their progress now: it is the critical time.

On my own occupation I can never accomplish the work I have to do, and have long looked to our implement manufacturers and mechanists for appliances to effect what I have hitherto failed to complete. I want all my arable land turned or broken up in the month of September, in order to catch the sun's hot rays and every atmospheric influence to be derived at this period from whatever source—one of which I conceive to be the deposit of vegetable effluvia arising from so much decayed vegetation at this season. I want to prepare my land for the reception of these benefits, otherwise the dews of evening are taken off by the morning's sun, but if deposited in a pulverized soil it is likely to remain. Now I require appliances for this purpose. Our ordinary implements and usual number of horses are inadequate for the work; besides, much of it requires fine pulverization to make the annuals and other weeds grow, preparatory to their destruction by ploughing, &c. Samuelson's digging machine is a move in the right course, but we want something far more effective. I care not how the soil is moved, provided it accomplish a good pulverization. The plough and harrow will not always continue in the first rank as implements. I hope they will soon be superseded by some more effective and powerful machine, and that to be worked by other than horse-power. It does not much signify that our lands should exhibit such straight and nicely-formed furrows from "end to end" of our fields: we require good clean tilths and thorough pulverization: it is of little consequence if that be achieved in square plots or oblong lengths: every farmer can adapt his seeding and managment accordingly. He will also have to adapt his land to the use of such implements. Twitch and other strong-rooted grasses would less abound; they would receive unusual attention, as being a great hindrance to "digging machines," or such similar appliance; the work of the farm would undergo a revolution. Imagine the plough set aside, as superseded; two-thirds of the farm horses sold off; and the whole farm assuming the appearance, and receiving the culture of a large garden, irrigated by liquid manure through gutta percha tubes! I don't laugh at such things; I have seen great advances made in agriculture; and I can well conceive that much remains to be done. "Agriculture is yet in its infancy," for all that has been done.

Culture.—No land undrained by subsoil drainage is in fit state for autumn culture. A dry autumn and dry land are equally requisite. The first land ready for working is that from which the pea crop has been carted. This land and the land cropped with beans are generally so infested with slugs (white snails), that I hold the tilling or other working of these lands essential to the prosperity of the ensuing wheat crop: the continued stirring of the soil destroys both them and their food. In both cases these crops should be cut close to the ground; the land is then ready for the broadshare, skeleton plough, or other like implement, by which it may be broken up in a rough and uneven state. The heavy harrows should shortly succeed, but in a transverse direction,

so as more effectually to work all truly well. These should shortly be followed by the lighter harrows and field roller: this, again, by the harrows. The weeds and rubbish should then be raked together, and carted off to the fold-yard (not burnt) to make good manure. This rubbish forms a good foundation for a manure-heap on the bottom of the fold-yard. The oat land should be next attended to, particularly in those districts where this crop is followed by wheat. This land should first be well harrowed, to induce the growth of the fallen oats and weeds; or, if broken up as above, it should be at very shallow depth, the design being to obtain a quick and luxuriant crop of green herbage to plough in for wheat as a manure, and the repeated harrowing will generally produce light mould enough to promote the growth of the grain and seed for this purpose; besides, if this land is broken up, it will not consolidate again in the same way as the bean and pea lands, but will remain lighter through the winter, which is injurious to the progress of the wheat crop. It is better to harrow with sharp-toothed heavy harrows, and then plough all in, and, if possible, roll it down for wheat. Oat land, of fair strength, will in this way produce excellent crops of wheat; and with the application of some of our numerous supplies of artificial manures, I see no great reason to deprecate the practice. I invariably sow wheat after oats, and they are generally my best crops. The land must be kept in high condition to follow this up. The turnips to be eaten off with cake or corn; then oats followed by wheat; manured for beans or peas; and again wheat. The wheat lands intended for fallow should be well and deeply broken up—the rougher the better—and should thus remain during the warm weather. As the season advances they should be harrowed down; and as winter approaches or during the winter, when dug, to be ploughed up as deeply as possible, and the furrows should be laid as closely and compactly as the ploughman can lay them. The land will, notwithstanding, be sufficiently open to catch every benefit from frost, which is the only pulverizer at this period of the year. The wheat lands intended for beans or peas must be dealt with according to circumstances. I have occasionally had such lands looked over with fork to take out patches of twitch, &c., then broken up; afterwards manured in suitable weather, ploughed in, and let the land lie till seed time, when the whole has worked well with good heavy harrows, and a satisfactory result as to seed time and crops. These are matters for the farmer's best judgment at the time. If it appears most desirable, from the state of the land and the progress of the business of the farm, that any land should be left untouched till spring, by all means leave this; in such case, however, it should be manured in the winter, and be ploughed early enough to catch a late frost if possible; this saves great labour, and promotes a good seeding. Much as I would urge the subject of autumn culture upon my readers, and highly as I value it, I would greatly prefer my lands lying untouched than to attempt this culture in an unsuitable season. No land can be benefited by culture when *wet*. Who can forget last autumn? P. F.

THE FARMER AND HIS LABOURERS.—THE HIND SYSTEM OF THE SOUTH OF SCOTLAND AND THE ENGLISH BORDER.

We urged, in a former article, the necessity for a restoration of the relations which subsisted between the farmer and his labourers before the close of the last century. Let us now inquire what those relations were; how far a return to the old system is practicable; and if its restoration in its full extent is impossible at the present time, whether any substitute for, or modification of it, can be devised, which will secure equal advantages to the employer and employed.

The chief difference between the condition of the rural labourer during the eighteenth century, and his condition in the middle of the nineteenth, is this: that at the former period a larger portion of the work of the farm was executed by yearly servants, lodged and fed in the farm-house, who were looked upon as part of the family, quite as much as the rest of the domestic servants. Even on the large farms where this system prevailed, and the farmers did not associate with their servants, there was more union between them than at present, and there was a wholesome moral influence exercised on the conduct of the labourers. Among small farmers of the working class, which were much more numerous then, this influence was greater, and the union more complete. Master and servant were more on equality; they worked together in the field, and ate together at the same board. To the influence of the employer was joined that of a friend; and to these was added, in many cases, that of relationship, for they were not unfrequently connected by ties of consanguinity. The last remnants of this state of things still linger in some of our most secluded and least advanced districts; but the race of working farmers is rapidly disappearing. It is disappearing because they cannot compete with the large farmers who cultivate the soil more advantageously. Under the small

farmer, the labour is rarely applied so economically or effectively. There is less corn and more weeds grown, the produce is smaller in proportion to the cost of cultivation, and consequently the rents are ruinous to them, which a farmer of capital, working more with his head and by his supervision than by his hands, can pay with ease. Economically the old system was bad; but the moral and social effects of it were good. For twenty years and more, before the close of the eighteenth century, a change in the ownership and occupation of land had been in progress. The first stage in the transition was from yeomen cultivators to tenant farmers. When Marshall wrote on the agriculture of Norfolk, in 1782, he described the yeomen of that county as still numerous but rapidly diminishing. They were selling their paternal acres to swell the broad lands of the aristocracy. The growth of commerce and manufactures, and the increase of population, which began to develope themselves shortly after the accession of George III., had given a stimulus to cultivation. The waste lands were in course of inclosure, and the yeomanry found it more advantageous to become large tenant farmers than to remain small cultivating proprietors. The capital which was locked up in one-hundred acres of land, at three per cent., was sufficient to carry on a farm of at least thrice that size, in fixing the rent of which a valuer would allow the cultivator ten per cent. on his capital. The next step in the social revolution was the breaking up of the small farms, which made rapid progress during the last decade of the nineteenth century. Records of this may be found in the reports of the Board of Agriculture, and other agricultural writers of the period. Young, in his "Survey of Suffolk, in 1803," says, "An observation should be added here which the two scarcities experienced since the former edition of this work have brought forcibly to the minds of many farmers. The great and the rich ones profited considerably by the high prices, but the little ones suffered more by poor-rates than they were benefited by prices. Rent should always be calculated, for private use, in common with rates and tithes; for it must be evident on the first blush that a farmer can pay more rent where rates are 5s. in the pound than where they are 15s."

There had been, however, a great increase of poor-rates irrespectively of the rise in the price of provisions. The average price of wheat for the ten years ending 1780 was 45s. 10d. the quarter: for the ten years ending 1790 it had advanced not quite 2s. We have not the same means of ascertaining the diminution or increase of poor rates, for those periods, which we possess at present. Young, however, gives an example of a parish in Suffolk, a purely agricultural county, in which the levies for the poor, which had averaged £507 per annum for the ten years ending 1780, rose to £748 for the ten years ending 1790; the increase being most rapid for the last three years of the ten, during which the poor-rates averaged more than £1,000 a year. From that period they went on increasing every year till they amounted to more than £2,000 a year in 1796, when the account terminates.

The local authorities, from whom he derived his information, attribute this increase to a variety of causes. One of them describes as an evil, which if not speedily removed would in many populous villages be the ruin of the small farms, the irresistible power and jobbing of the overseers in their respective parishes. They were, he says, in many instances landholders who had received no advantages from education, and were put by routine into office in consequence of their large occupations. He instances cases in which the attention of gentlemen to parochial business saved £300 or £400 a year in the expenditure of the parish; "but as soon as they ceased to attend, the stream returned into its former muddy channel, and the lost time to the selfish contractors, who winked at each other's exorbitant bills, was amply compensated by a rise in the rates, increasing nearly in arithmetical progression, as the abstract from the rate-books of these parishes abundantly testifies." The recklessness with which some magistrates gave orders for relief comes in for its share of blame, and the consolidation of farms is not forgotten, both as cause and effect; whilst the increase of rates ruined the small farmers, these swelled the tide of paupers receiving parochial relief. The remedy proposed for this increase of poor-rates, and partially acted on in Suffolk at that time, was that which in 1835 was made general to repress this and other evils in the administration of the poor laws, which had risen to such a height that the rates bid fair to absorb the entire rental. Another evil attributed to the consolidation of farms was the absence of all stimulus to economy on the part of the labourer by the abolition of small holdings. To take one of these, and to raise himself in the social scale, had previously been the height of his ambition; and to accomplish it, he was frugal, sober, and industrious. But now, it was said, a labourer will not hoard to spare the parish: wages and parish allowance are all he has to look to. During the same period, with this rise in poor-rates, these writers notice an increase in the illegitimate births. They notice, also, an increase of births in general during a succession of years of high prices—an enigma which they consider to be solved by the depression of the labourer, the absence of all hope of advancement

and motives of economy, which rendered him not ashamed of applying to the parish in his youth, and certain of a sordid sufficiency with a family of any magnitude. Now mark, we are quoting the agricultural authorities of the period when the change was in progress, who conclude that, strange as it may appear, the condition of the labourer had deteriorated in proportion as agriculture had improved. The problem to be solved now is, how that improved agriculture which the present social condition of Britain requires can be made consistent with an improved condition of the agricultural labourer? Does this problem admit of a satisfactory solution? We believe that it does, and we will endeavour to point it out.

The hind system of the south of Scotland and the English border appears to hold out the best prospect of a solution of the problem how the restoration of more cordial relations between the farmer and his labourers can be combined with the cultivation of the land by large farmers possessing capital—a system now irrevocably established, and which various causes are contributing to extend. We traced in former articles the rise in the price of wheat, and the rapid increase of poor-rates, with the concomitant deterioration of the condition and character of the agricultural labourers which marked the latter years of the eighteenth century. With the consolidation of farms, and the high price of provisions, they had begun to be dismissed from the farm-houses, as troublesome to the more refined inmates; and, with continually rising markets, it was found less economical to feed them in the house than to give them money wages and to leave them to feed themselves as best they might. But the famines of 1800 and 1801—during which wheat averaged for the two years 116s. the qr.—completed the ruin and degradation of the rural population. Then commenced the system of relief in aid of wages, which pauperised the peasantry of England; and from that time the "management of the poor" became quite as much an agricultural question as that of the most profitable mode of keeping horses, and was too frequently regarded from much the same point of view.

A few remarks from Young's correspondents in Suffolk mark the rise of the system, and its date from those ill-omened years. One of these says of the parish which he describes: "The additional assistance given on occasions of the late scarcity, independent of regular collections and occasional relief, was 6d. a week for every child in the family." "At Stoke-by-Nayland," says another, "besides forty-three persons, young and old, maintained in the parish workhouse, and several who from age and infirmities receive a constant weekly allowance, one hundred and seventy-seven families and single persons receive an extraordinary allowance of sixpence per head to the smaller, and ninepence to the larger families; and this added to their wages, about eighteen-pence a day, is barely sufficient to furnish them with bread only. Nor does any other mode of relief seem likely to prove effectual to the lower orders, except a rise of the labourer's wages proportioned to the price of corn."

There were, however, a few highly cultivated counties in the north of England which escaped the baneful influence of the system, because when the march of agricultural improvement commenced there, the old custom of paying labourers in kind was happily retained, so that their wages rose with the price of their food. In Northumberland, and other border counties, a large portion of the work of the farm continued to be performed by hinds or married servants hired by the year, residing in cottages attached to the farm, receiving very little money, but an ample allowance of corn for the support of a family of the average number, together with the keep of a cow, and a small piece of ground on which to raise flax and potatoes. By the custom of the country the hind is entitled—not to the tail corn, which is often sold at a high price by the farmer to the labourers of the south—but to the best corn grown on the farm, next to that used for seed; while, in the south, money sufficient to support a single man was made the standard of wages, and the difference necessary—not for the support of a family, but to keep them from actual starvation—was added from the poor-rates. In those northern counties where the hind system prevailed, the standard of wages was the quantity of food, no matter what its price, sufficient to support a man, his wife, and the average number of children. Those hinds, therefore, with smaller families, or none, had a surplus of grain to receive at the year's end, for which they were generally paid in money by their employer, at the average price of the year. The man with a large family had food enough and none to spare, and it mattered not to him whether wheat was worth 40s., or 80s., or 116s. the quarter; but the man with a small family was benefited by a high price of corn quoad the surplus beyond the wants of his family. In another point of view the northern hind has the advantage of the southern labourer. While the latter pays exorbitantly at the village shop for everything he consumes, and, being too often tempted to spend his money at the alehouse, is generally in the power of the shopkeeper by being in his debt, the northern hind has always one quarter's allowance of grain given him in advance. His cow runs with the cows of his master; her milk supplies the children with wholesome food; and the sale of the calf and of some butter, if the cow

be a good one and the wife a good manager, brings in some little money. The value of the cow to the labourer is therefore much more than the cost of her keep to the farmer.

The money wages and the payments in hand to the northern hind vary with prices—according to Mr. Grey, of Dilston—from £30 to £40 a year, besides the money earnings of the family, who find pretty constant employment on the farm.

The following are the wages of a Northumbrian hind in produce and money, with the money-value of the former at the present time :—

	£	s.	d.
Oats 4½ qrs., at 20s. per qr.	4	10	0
Barley 3 qrs., at 30s. per qr.	4	10	0
Peas 1½ qrs., at 36s. per qr.	2	14	0
Wheat 3 bush., at 48s. per qr.	0	18	0
Rye 3 bush., at 36s. per qr.	0	13	6
	13	5	6
Potatoes, 36 bush.	1	16	0
Carriage of coals from the pit	0	16	0
Cottage and garden	3	0	0
Keep of cow	8	0	0
Cash	4	0	0
	30	17	6

These wages are equal to something less than 12s. a week; but they give the labourer a much greater command over the necessaries of life than would be derived from 12s. a week paid in money. And they have this further advantage over money-wages, that they undergo no interruption from sickness and bad weather.

While this system of paying farm servants secures to them a sufficiency of the necessaries of life, however high their price may rise, it possesses this pecuniary advantage to the farmer, that during a period of low prices wages gradually and imperceptibly adjust themselves to those prices, without any of those heart-burnings between the farmer and the labourer which are produced by constant bickerings about pay. The only money payments the hind and his master have to adjust are the yearly money wages, which, fluctuating slightly with the demand for labour, are fixed at the yearly hiring, and the value of the surplus corn which the hind may not have drawn during the course of the year, which is settled by reference to the *Gazette* averages; or, if the hind prefer it, he can draw the surplus, and sell it himself.

During the agitation against the truck system of the manufacturers, attempts were made to set the northern hinds against this payment in kind as a part of that obnoxious system; they accordingly demanded a change of system at the next hiring. Most of the farmers refused to accede to the demand, but some of them gave way; and the men found the apparently higher wages of the day labourers, which they had coveted, so much less advantageous to them than the payments which they had heretofore received in kind, that at the end of the year they requested to return to the old plan again. It has been found, too, that after a hard winter, when there has been much interruption to field work from snow, many day labourers seek the next year to be engaged as hinds.

Such are the pecuniary benefits both to the farmer and the labourer of the hind system—that is, the employment of hired householders resident on the farm, paid chiefly in kind; the keep of a cow, summer and winter, forming a portion of their pay. We shall hereafter show the moral advantages of the system in the frugal and prudent habits it promotes among the peasantry, and the good feeling which it engenders between master and servant. The witnesses whom we shall summon will be the Rev. Dr. Gilly, of Norham, who wrote a pamphlet, as an appeal for a better description of cottage than that usually provided for the hinds; and Mr. Grey, of Dilston, whose name stands so high among practical agriculturists.

The moral and social advantages of the hind system, the habits of economy and prudence which it produces in the farm servants, and the good feeling which it engenders between them and their employers, have been well described by Mr. Grey, of Dilston, who has had so much practical experience of the working of the system. His remarks on this subject will be found in the second volume of the *Journal of the Royal Agricultural Society*, in an article on the past and present state of agriculture in Northumberland. He points out the benefit which the hind receives from this mode of paying in kind, in consequence of having a store of wholesome food always at command, untaxed by the profits of intermediate agents, and in consequence of the absence of temptation to dissipate at the ale-house part of the money which should go to the support of the family—a temptation to which they are exposed who are paid their weekly wages in money, and are under the necessity of resorting to a village or town for the purchase of provisions. He remarks, also, on the domestic employment which the gardens of the hinds afford in their leisure, and to these causes he attributes much of the sobriety and excellent moral conduct which distinguish the peasantry of the north.

"Habits of industry and economy," he says, "are promoted, and domestic and social virtues are engendered, in a manner and to an extent unknown in those districts where the younger members of a family are early driven from the shelter of the paternal roof, and the control of a parent's eye; or where the parents, deserted by their children, are forced to take refuge, under the infirmities of age, or the pressure of want, in the corrupting atmosphere of a parish workhouse.

Look into one of our north-country cottages during a winter's evening, and you will probably see the family group assembled round a cheerful fire, the females knitting or spinning, the father, perhaps, mending shoes—an art which almost all acquire—and one of the young ones reading aloud for the amusement of the whole circle; and contrast this with the condition of many young men employed as farm servants in the southern counties, who, being paid board wages, club together to have their comfortless meal cooked in a neighbouring cottage, with no house to call their home, left to sleep in an out-house or hay-loft, subject to the contamination of idle companions, with no parent's eye to watch over their actions, and no parent's voice to warn them of their errors; and say which situation is best calculated to promote domestic comfort, family affection, and moral rectitude."

The moral advantages which the hind derives from the possession of a cow, to obtain which is the great object of his endeavour and ambition, are next dwelt upon. It is useful, both as a stimulus to industry and economy, and a check to improvident marriages. "He knows that he ought not to marry till he possesses the means of purchasing a cow; and this, the first step to independence, being accomplished, a cottage respectably furnished, and a situation obtained under a good master, he brings home his bride, feeling that he is a useful and comparatively an independent man."

Again, in the being hired for the year, there is a similar advantage which acts and re-acts on servant and master. In seasons when employment is scarce, and when day labourers are turned adrift, however unproductive the services of the hind to his master, his wages go on. Even months of confinement from ill-health produce no diminution of his pay.

"It may seem hard," says Mr. Grey, "that the master whose servant has fallen into ill-health, and is unable to work, should still have to make good his bargain; but such is the custom; and were it otherwise, the family would soon, in many cases, be thrown upon the parish. The farmer may as well, then, take the chance of supporting his own for awhile, as be compelled to contribute to the support of all who might fall into similar circumstances throughout the parish. But by far the best reason for the custom is, that it gives rise to a feeling of gratitude to a master for having afforded gratuitous relief, and a desire, which I have often heard expressed by servants, to make up for the loss he had sustained by the best services they could bestow; and surely the sacrifice is not too great, if it saves one honest man from the feeling of degradation which ought, and still sometimes does, attend the application for parochial relief."

The system of payment in kind produces another tie between the farmer and the hind. He is entitled to the best of the corn grown on the farm, and his cow runs with his master's cow. He has thus a personal interest in the produce of the farm, and a desire to secure it in good condition. The system likewise produces a set of local attachments, which often lead to connections of long continuance between master and servant. The discomfort and inconvenience of moving a family and furniture from place to place, operate as an inducement to the hind to remain in a comfortable situation, and to conduct himself so as to give satisfaction to his employer. On the other hand, as the farmer, by custom, sends his carts and horses for the family and furniture of each new comer at a busy time of the year, there is a loss of time and an inconvenience in this, which must render it his interest to encourage and retain a respectable servant, and thus mutual accommodation and respect are produced. "Orderly habits," says Mr. Grey, "and respectable conduct on the part of the servant, produce consideration and kind treatment from their masters; and in this way the majority of our population come to the end of their days, without having suffered the degradation of being on the list of parish paupers." He says, elsewhere, that he never knew an instance of a regularly hired farm servant or hind applying for parochial aid in time of health, however large his family; and that though in the case of widows and orphans assistance must be given, sixpence in the pound covers, on the average, the poor-rate in strictly agricultural parishes.

In corroboration of these statements, the following list is given of servants, being hired householders, resident on a large farm in Northumberland, with the length of time they had lived under the same master, and the sum which remained due to each at the settlement of their half-yearly accounts at Martinmas.

	Years' service.	Cash due on his account at Martinmas. £	s.	d.
George Cranstown ..	25	8	3	6½
Alex. Tunnah	12	15	0	4½
John Redpath	1	9	7	11½
Samuel Ewart	30	5	5	9½
Andrew Gray	9	7	14	4½
Andrew Elliot	14	23	2	2
Thomas Robson	4	4	3	11
James Cranstown....	20	6	12	4½
Andrew Young.....	12	7	2	5½
Edward Davison	15	5	15	1
George Chirnside....	10	5	16	7
John Middlemas	3	4	9	10½
Thomas Fullerton....	18 In debt to his master	7	9	8

These sums consist of the surplus, arising from

the joint labour of all the members of the different families, which they had not found it necessary to call for, during the course of the half year, but left in their masters' hands till the final settlement of their half-year's account. The cases of Thomas Fullerton, John Redpath, and George Chirnside, speak volumes in favour of the system. Fullerton had lost a valuable cow by death; and being unable, from his large family (too young to do much work), to purchase another, his master favoured him with a loan of ten pounds for that purpose, to be repaid by instalments. In such cases, the master frequently gives the use of one of his cows till the hind can procure another; but the servant is always anxious to have the credit of possessing a cow of his own; and we fully concur with Mr. Grey, that it would be absurd not to encourage such a feeling.

To provide for such casualties, cow-clubs are now established, to purchase cows for those members of the club who have the misfortune to lose one. The farmers subscribe according to the number of their hinds; and each hind, to enjoy the advantages of the club, subscribes 1s. a quarter. Redpath had been disabled, by illness, from working for nearly three years. The father of Chirdside had died, leaving a widow and four young children, of whom he was the eldest; but since he was sixteen years old the whole family had been supported by their own industry. He was first assisted by his master in the purchase of a cow, which debt had been cleared off, and the family placed in comfortable circumstances.

Under the system of money wages in the south, these families would have sunk into permanent pauperism.

There are two circumstances connected with the hind system of Northumberland which have brought some discredit on it among those who do not look below the surface. They are excrescences on the system, not necessary parts of it, and need not accompany its introduction into the south, neither should they be retained in the north. These are the bondager, and the miserable condition of too many of the old cottages inhabited by the hinds, and the insufficient accommodation which they afford for a family.

The history of the bondager is this: The absence of villages in a thinly peopled country, rendered it necessary to have constantly at hand a disposable force of women and boys for weeding, turnip-hoeing, and attendance on the thrashing-mill. This gave rise to the system of hired householders resident on the farm, thus creating for each farm a little village of its own. The families of these householders generally find pretty constant employment at this kind of work. One, however, each hind is bound to have ready at all times, at the master's call—and hence the name of bondager—to work at stipulated wages. Where the hind has one or more daughters there is no hardship in this; because when called out in the summer months, at which time there is regular employment, she receives the current wages paid to those not thus bound to attend; and when not so employed there is occupation for her in spinning, knitting, and other work of the house. It is different in the case of a hind who, having no children of sufficient age for the work, is then obliged to hire a servant, whose services may not be required at home when not employed on the farm. This hardship becomes greatly aggravated, when, from the small size of the cottage, and its one sleeping-room, there is not decent accommodation for such additional inmate. Even with these drawbacks, however, the advantages of the hind system to the labourer are found to counterbalance the disadvantages. Mr. Gray says, that when a few years ago attempts were made—which were in part successful—to raise an agitation against the system of being bound to provide a bondager, and when only one farmer, whose local situation rendered him independent of the system, yielded to the demand, engaging his men at money wages, with regular employment, they all desired, before the end of it, to return to their former footing.

The defective state of the hind's houses is a more serious evil. The same negligence as to the comfort of the labourer in that respect appears to have prevailed in the north as in the south. Some years since, the Rev. Dr. Gilly of Norham, remonstrated with the landowners on this subject, in a pamphlet entitled "The Peasantry of the Border;" in which, while he paints in strong colours the wretched condition of the cottages, he admits that it is in the course of correction, and bears testimony to the advantages of the hind system in other respects, and the high character of the Northumbrian peasantry, which we have seen Mr. Grey ascribing in a great measure to the system of payments in food. "How often," says Dr. Gilly, "when I have visited these hamlets and cottages, have I been surprised by the contrasts which they exhibited. To look at the exterior, you would suppose that they were inhabited by a tribe of savages. Enter the doors, and you will behold an apartment amply supplied with household chattels, and smiling with content. The cotter and the housewife have done all for themselves which good management can devise. And, in fact, there seems to be a general contribution towards the well-being of our hinds, except by those who provide their habitations. Thanks to the farmers, they have, for the most part, kind and considerate masters. The reply which a worthy

farmer made to me, on my asking him what he did to induce his hinds to remain with him, should be characteristic of his order: 'I try to make them comfortable, and I overlook little faults in good workmen.' I have resided," continues Dr. Gilly, "in many counties, but in none have I seen the relation between farmer and labourer so admirably adjusted as in Northumberland. Thanks to machinery and manufactures, they have good raiment, comfortable furniture, and gay crockeryware: thanks to benevolent societies, they have their little bookshelves adorned with bibles, books of devotion, and tracts and treatises of useful and entertaining knowledge; and, gratitude to a bountiful Providence, they have fuel in abundance, and a blazing hearth. 'The barrel of meal wasteth not, neither does the cruse of oil fail.' But, alas! they have not tenements worthy of such families as are the pride of our land."

In another place he says—"Every hind's wife has an especial pride in exhibiting her collection of large blue plates, dishes, and plates, some of Staffordshire ware and others of delf, intermixed with old china or porcelain tea-pots, cups, and saucers. I have not unfrequently seen relics of a choice and rare pattern, which Queen Charlotte herself might have coveted. Then comes the handsome clock, in its tall case, and the chest of drawers, sometimes of new wainscot, sometimes of antique carved work, which, again, many a collector would like to lay his hands on, and which contains decent apparel for all the family, such as they take an honest pride in wearing on all proper occasions; and where have we a better-dressed population than among the northern peasants? The barrel of meal and the barrel of herrings occupy their places. The rack above displays some goodly flitches of bacon. White bread loaves we seldom see. The griddle-cake, composed of barley and peas, with the oaten porridge and potatoes, are the usual substitutes."

Again, after describing the contents of the bookshelves, "the big *ha' Bible*, ance his father's pride," and the biblical knowledge of the hind, he adds, "His cottage very seldom contains any loose productions; the vulgar ballad and the ribald jest are not to his taste."

There may be something in race—there may be something in local circumstances; but surely, when we contrast the condition and general character of the hinds of the north with those of the agricultural labourers of the south, it is impossible to arrive at any other conclusion than that much of the superiority of the former arises from their residence on the farm, and from the payment of their wages in kind.

Mr. Grey furnished a statement of the length of service of the hinds on a large farm in Northumberland, and the wages due to them on the settlement of their half-yearly account at Martinmas.

Dr. Gilly gives a number of cases illustrating the money earnings of a hind and his family. The cow, meal, and other payments in kind are valued by him at £32 10s. In case No. 1 there were added to this the following items: The earnings of the wife in harvest, £3; the daughter, aged nineteen, living with her father as bondager, earned £9 4s.; and a son, aged twelve, £5 10s. 6d.; making the total income of the family £50 4s. 6d. In case No. 2 the collective earnings amounted to £51 18s.; and in case No. 3, where there was a family of ten children, they were as much as £68 8s. With the same value as before put upon the "conditions" or payment in kind, the usual earnings and advantages of a hind who has not a family sufficiently grown up to work, are estimated by Dr. Gilly as under:

Man's grain, money payment, &c.	£32	10	0
Wife's harvesting...	3	0	0
Bondager earns	9	0	0
	£44	10	0
If the bondager is not one of the family, her wages must be deducted	7	0	0
	£37	10	0

Sometimes a father and grown-up son are hired together, in which case the father receives the usual quantity of 36 bushels of oats, 24 of barley, 12 of peas, 3 of wheat, and £4 in cash; and the son, 24 bushels of oats, 12 of barley, 6 of peas, some ground planted with potatoes, £11 in money, and no additional cow. A case like this of a *double hind* (as it is called) in one family is considered equally advantageous both to the farmer and the labourer.

WHY IS POULTRY A LUXURY?—In Great Britain, poultry is generally considered more an article of luxury than t is in most other civilised countries, probably because the climate of Great Britain is moist and cold, and all the gallinaceous birds require warmth and dryness to keep them in health. In France, as Mowbray observes, "poultry forms an important part of the live stock of the farmer, and the poultry yards supply more animal food to the great mass of the community than the butchers' shops;" and hence, in France and on the continent of Europe generally, fowls are bred on a much larger scale than in England. It is well known that in Egypt and other countries of the east, the quantity of common fowls used for food is so great that it has been found necessary, from time immemorial, to hatch the chickens in ovens, by artificial heat. In England, on the contrary, the consumption of poultry is very trifling in proportion to that of butchers' meat, and its price is sufficiently high to justify the expense incurred in rearing and feeding. In this country, also, greater care is taken than in any other to keep the breeds distinct; and fancy poultry is bred to a very considerable extent, particularly since the institution of prize exhibitions in various parts of the kingdom.—*Dickson and Mowbray on Poultry, by Mrs. Loudon.*

AGRICULTURAL STA-

THE FOLLOWING ARE THE RETURNS RELATING TO AGRICULTURAL STATIS-

ABSTRACT OF AGRICULTURAL STATISTICS OF THE COUNTIES OF ROX-

Counties.	Imperial Acres.		Number of Acres under Different Kinds of Crop.											
	Total.	Arable.	Wheat.	Barley.	Oats.	Rye.	Beans and Peas.	Vetches.	Turnips.	Potatoes.	Mangold.	Carrots.	Cabbage.	Flax.
Roxburgh ..	358943⅝	146818⅜	5181⅛	14615⅜	28862⅛	14	1642⅜	380¼	23809	1454 29/40	16½	6⅜	10⅞	2½
Haddington ..	149173½	107269¾	15339⅜	12809⅜	16802	46¾	4809	1011¾	16260	4246¾	48¼	107	15¾	—
Sutherland ..	810903¼	22022⅛	627¼	3682	6121¼	8¾	89¾	139¾	2212½	2279¾	—	1½	2	1/12
	1319020⅜	276110 41/60	21148¾	31107⅛	51785⅜	69½	6541⅛	1532	42281½	7981 9/10	64¾	114⅞	28⅝	2 7/12

ABSTRACT OF THE AGRICULTURAL STATISTICS OF 2,680 CROFTS

DISTRICTS:

No. 1. Parishes of Assynt, Edderachilles, and Western portion of Durness .....
No. 2. ,, Tongue, Farr, Eastern portion of Durness, and that part of Reay in Sutherland
No. 3. ,, Dornoch, Creich, Lairg, and Rogart .....
No. 4. ,, Clyne, Golspie, Kildonan, and Loth .....

County of Sutherland	No. of Crofts.	Imp. Acres.		Number of acres under Different Kinds of Crop.										
		Total.	Arable.	Wheat.	Barley.	Oats.	Rye.	Beans and Peas.	Vetches.	Turnips.	Potatoes.	Mangold.	Carrots.	Cabbage.	Flax.
District No. 1	557	60615	2490½	—	766½	1088½	—	—	—	29	600½	—	—	—	—
,, No. 2	704	30370	2057	—	685	685	—	—	—	40	587	—	—	—	—
,, No. 3	785	13674	4239¼	—	447½	1730¼	7	19¼	—	246	580	—	—	—	—
,, No. 4	634	2205	1490	—	460	468	—	—	—	51	353	—	—	—	—
	2680	106864	10276¾	—	2359	3971¾	7	19¼	—	366	2121	—	—	—	—

THE FOLLOWING ABSTRACT GIVES THE NUMBER OF STEAM AND WATER ENGINES, ETC., APPLIED the power of 1,053 Horses. Water Wheels, 81; giving the power of

AGRICULTURAL STATISTICS.

In all the discussions upon the subject of agricultural statistics, the question hitherto has been, not the propriety of the thing, but its practicability. To that question, so far at least as Scotland is concerned, a conclusive answer is given by the parliamentary return with which our columns are this morning overspread. Dubiety itself must cease to doubt of the possibility of doing what it actually beholds done. The feat is accomplished. The Highland and Agricultural Society have silenced objectors, very much as Columbus silenced the sages who declared it was impossible to make an egg stand on-end. They have done it: with the spontaneous help of the public-spirited and intelligent tenant-farmers of the north, they have achieved what was pronounced to be hopeless. The statistics which we were told could not be got, are before us; and the passion for agricultural arithmetic must be extravagant indeed, which is not satiated with the portentous amplitude of volume and microscopic minuteness of detail of the figures with which our sheet bristles to-day. Does a man wish to know how many roods of flax, or how many acres of carrots or cabbages, are grown in Sutherland; how many ewes, tups, and wethers are pastured in Teviotdale; or how many milch cows are kept, how many steam-engines are at work, what breadth of land is sown with wheat, covered with houses, or planted with potatoes, in East Lothian—there, in the tables which we publish, is all the information that he can ask or desire, not only on these matters, but on almost every other conceivable point of husbandry. Grass parks and irrigated meadows, bare fallow and sheep-walks, corn-land, woods, waste,

TISTICS (SCOTLAND.)

TICS OF THREE COUNTIES IN SCOTLAND PUBLISHED BY THE GOVERNMENT.

BURGH, HADDINGTON, AND SUTHERLAND, ON THE 20TH MAY, 1853.

				Number of Acres not in Crop.					Amount of Stock.					
Turnip Seed.	Alternate Grasses.	Improved Permanent Grass Inclosures.	Irrigated Meadows.	Bare Fallow.	Sheep Walks.	Houses, Gardens, Roads, Fences, &c.	Woods.	Waste.	Horses.	Milk Cows.	Other Cattle.	Ewes.	Tups and Wethers.	Swine.
43⅝	44558⅛	23658⅜	925¼	966	186895 9/10	4900¾	17679	3320	4975	4762	12058	226894	51869	4607
157⅝	26885	6228¼	87	2127¾	28630⅝	2586½	9313¾	1660⅜	4450	2377	7576	36979	29597	5580
1	4977⅜	1779½	38¼	23	599710⅝	2290 11/12	10812⅜	176104⅜	2794	6547	6045	97666	70504	1310
202¼	76420⅝	31666⅜	1050½	3116¾	815237 4/10	9777⅜	37806	181085⅝	12219	13686	25679	361539	151970	11497

IN THE COUNTY OF SUTHERLAND, ON THE 20TH OF MAY, 1853.

ENUMERATORS:

..... Evander M'Ivor, Scouric.
..... Alex. Clarke, Eriboll, Tongue.
..... Robert R. Sangster, Golspie.
..... Charles Hood, Inverbrora, Golspie.

				Number of Acres not in Crop.					Amount of Stock.					
Turnip Seed.	Alternate Grasses.	Improved Permanent Grass Inclosures.	Irrigated Meadow.	Bare Fallow.	Sheep Walks.	Houses, Gardens, Roads, Fences, &c.	Woods.	Waste.	Horses.	Milk Cows.	Other Cattle.	Ewes.	Tups and Wethers.	Swine.
—	6	—	—	—	48724½	900	—	8500	307	1774	676	3788	824	—
—	—	53	—	—	22006	244	—	6070	302	1607	877	3485	1788	19
—	979¾	211½	—	—	3729¾	185¼	—	5537¼	924	1334	1564	2184	1387	499
—	158	—	—	—	—	—	—	715	446	546	354	150	50	309
—	1143¾	264½	—	—	74160¼	1329¾	—	20822¾	1979	5261	3471	9597	4049	827

TO AGRITULTURAL PURPOSES IN THE COUNTY OF HADDINGTON, 1853:—Steam Engines, 185; giving 436 Horses. Horse Machines, 107; giving the power of 499 Horses.

pleasure-grounds, roads, fences—all are measured and set down. We see, to an acre, what is the extent of every kind of cereal crop in the three shires selected for this experiment; and, in a month or two hence, the same skill and enterprise which have furnished us with this information will supply the farther information, how much each crop has produced. Let it be supposed that what has been done in these three counties were done—and there is no reason why it might not be done—throughout all the three kingdoms, and the importance of the result will be at once apparent. We should know, by the end of October or beginning of November—certainly before the frost closed up any port on the corn-exporting shores of the Baltic—how many quarters of grain the British Islands had produced for the support of their inhabitants; how many hundredweights of potatoes of our own growth were at our command; what number of sheep and cattle our stock-farmers and graziers were able to send to market. To be forewarned—in such a case above all others—is to be fore-armed: with such knowledge as this, we should be in a position either to provide in time for the necessities of a dearth, or to indulge with assured confidence in the blessings of plenty. Our corn merchants would know how to regulate their foreign orders; and the British farmer would escape such hardships as those of which he had a taste last spring, when a miscalculation of the result of the harvest in the United Kingdom glutted our ports with grain from abroad, and reduced the prices of the English market beneath their due and natural level.

The value of the tables compiled by the Highland and Agricultural Society lies, as we have said, not so much in the mere information which they supply, as in the

demonstration which they afford that such information can be collected. They are but bricks from a building —but such a building that even its detached fragments are not without significance. The return of the motive power, for example, applied to farming purposes in East Lothian, is instructive in many ways. One great hope of ameliorating the condition of the mass of mankind rests on the probability that mechanical inventions may so far increase the productiveness of labour that, with less work of man's hands, there will be more fruits of industry for man to enjoy. It is interesting, in this point of view, to see that in one small county such as Haddington, machinery has already set free as much labour as two thousand horses could perform. More than one-half of this mechanical power is impelled by steam, and when we find that in East Lothian alone there are nearly 200 steam-engines, we can understand how it is that the tall chimney has begun to show itself so frequently beside the well-filled corn-yards and spacious steadings of our richest and best-farmed districts. The returns are useful, in another point of view, as proving how utterly worthless the best agricultural statistics hitherto attainable really are. Thus it appears, from the trustworthy computation of local enumerators, that the number of acres of arable land in Sutherland is 22,022¼. But, until this return was procured, the number was generally reported and believed to be not less than 150,000 acres—or about seven times more than the actual number! It was no rash or random conjecture that led to such an enormous blunder. The statement was given in as evidence before a committee of the House of Commons, by Mr. Couling, a civil engineer and surveyor, who stated that his calculations —which comprehended the whole island—were for the most part the result of personal inspection during journeys of more than fifty thousand miles, in the course of which he had carefully examined the greater part of 106 counties and partially travelled over the remaining 11, availing himself of the very best authorities for completing his estimates where his opportunities of personal observation were deficient.—Edinburgh Courant.

[Above is a summary of this interesting and, to the farmer, most useful return.—Ed. F.M.]

THOUGHTS ON HARVEST TOPICS.

Wet seasons seldom fail to involve the harvest field in adverse circumstances of some kind or other. There are, no doubt, exceptions from this rule, as there are from almost every other, for sometimes fine weather breaking forth for a month or so makes a very successful ingathering; but the reverse is generally experienced, and we fear will be so in not a few provinces this year. The characteristic of the present season, however, has hitherto been diversity, and may be so still, affording some provinces a short and busy harvest, but others a long and protracted one; at the same time, there is much that is common in the generality of instances, tending to a common result, and requiring peculiar practice.

Some undrained clay lands here (Surrey) have absorbed such a quantity of rain as to dig freely at present, water standing in the foot-prints of horses and cattle after every shower as in winter, and such has been their position since the commencement of hay harvest; consequently, with such a quantity of moisture in the soil, wheat and other cereals have been affected both before and after reaping. Before reaping, the roots of such crops have absorbed, and are absorbing, a larger quantity of water than they otherwise would have done, or would do had the lands been baked into bricks as it were, as they invariably are in dry years; so that the process of ripening has been protracted, owing to the heat of the sun having been carried off by the greater amount of evaporation which under such circumstances existed; while both corn and straw contain a larger quantity of water, rendering the process of drying after reaping more difficult.

It does so where the crop is sufficiently thick to ripen equally; and where it is thin, as wheat generally is this year, it does more, for then the ground is either filled up with weeds or young shoots tillering forth from the plants, both of which retard reaping as well as carrying. After reaping, again, the bottom of the sheaves absorbs moisture by capillary action, protracting the process of drying even when the weather above is fine, especially if they are large, full of weeds, clover, or unripe corn; for in such cases it is sometimes necessary to turn them up to the sun and wind, and not unfrequently untie or shake up the bottoms.

On lands naturally or artificially drained, crops have not suffered so much; and between those efficiently drained and the opposite there is an important difference, deserving of special consideration in a season like the present; for it is only from a proper record of facts of this kind that we can ever expect to arrive at a satisfactory settlement of the many controversial questions now existing on the subject of draining, or even ascertain its true value. Where the heavy thunder-showers of last month were immediately removed by the drains, for instance, crops have suffered less from an excess of moisture both in the soil and atmosphere, and have consequently ripened quicker and more equally, and will be sooner fit for carrying, than on soils where stagnation of the water took place, filling up the cracks of the earlier season, so as by this time almost to prevent the free egress of water by the drains.

Between these two results there is a considerable difference, and where the heavy rains of spring were also removed from young wheat as fast as they fell by the drains, the difference will be greater still. Now the present is the time to determine those differences, so as to measure the ground and otherwise take the necessary preliminary steps for having the question fairly settled

as to the difference in the quantity and quality of produce when threshed. To jumble the whole together hurriedly in the stack-yard, and then to guess at results, is neither to solve the question or let it alone; much less is it doing justice to the science of drainage, whose different propositions ought in all cases to be coupled with their respective parts in practice.

The proper drainage of land affects the operation of harvest, as well as the ripening and drying of the crop for reaping and carrying; for, when the land is wet, they are in both these departments more laborious, and hence more expensive, while much corn is trampled into the ground both in the field and stack-yard, the rakings being often only fit for pigs; and, now that we are getting into the age of reaping-machines, differences in this respect may be more deserving of notice.

The effect of wet seasons in harvest will be varied by lateness of seed time, soil, climate and similar circumstances. Harvest in June and August, for instance, will be different from harvest in September and October; harvest on the east coast from that on the west, south from north, low-lying lands from elevated, and so forth. From the hurry which generally predominates in harvest, the causes which produce those differences, as well as the differences themselves, are but too frequently entertained in a very superficial manner, if not overlooked altogether. True it is that farmers are never wholly blind to the immediate causes of those circumstances which affect themselves. They know, for instance, that rainy weather makes a bad harvest-time. Thus far experience has taught them; but when we look at the antiquated practices which so many follow in almost every province, the question naturally suggests itself—How little do such practices experimentally teach the application of modern science under all the vicissitudes of a British climate? How little do the farmers of one province know the circumstances which those of another experience? And how great the cloud of prejudices which, consequently, envelop the agricultural mind, so to speak! circumscribing progress.

During the last twenty years the agricultural press has, doubtless, been working hard to dispel ignorance and error, and bring a knowledge of the four corners of the kingdom together, as it were; but from the rapid strides which applied science has been making, how short is the distance which its columns have been able to overtake her in the march of improvement! And, moreover, the present season is an exception out of twenty; hence, how few can bring experience to bear upon the subject, under all the changes which have taken place during this period! Mr. Bell, for instance, can give us some information as to the working of the reaping machine for this period: but who else? and he only in one of the midland counties of Scotland. In the investigation therefore of the several topics before us, in a season so exceptional as the present, science is of tenfold more importance than experience, although the experience of the present year is the grand problem at issue; consequently all that we can prudently do at present is, to throw out a few general observations on each, in the hopes that correspondents in other provinces will furnish the results of their experience as the season progresses.

Late harvests *versus* early, is the first. Rain does less harm in late years than early, because there is less heat. In the months of July and August ripe grain is much more liable to germinate in the shock, and even before cut, in wet weather, generally speaking, than in September and October. So far experience is familiar with the facts of the case in all our provinces, and therefore it would be superfluous to dwell upon this head of it; but when we come to new-fangled systems of management it is otherwise, for there experience is silent, leaving the farmer to do the best he may, as judgment may direct him. It is then that science comes in with her peculiar claims, demanding that justice be done to draining, trenching, and subsoiling; to manures; ploughs, digging, sowing, and reaping machines separately, so as to justify the investment of capital and determine the march of future progress. Unless this is done, all is speculation as to the value of the individual parts of the system.

A few suggestions have already been thrown out as to draining; and we shall only further on this head allude to the reaping machine, and here in the outset, for the want of experience, we hardly know whether to say this is a good or bad year for commencing; but we are safe to say, that it is one which demands particular circumspection of the whole *modus operandi*, embracing both the cutting, shocking, and carrying. Parties have "an apprentice fee to pay," as the saying is, commence when they may, before they can expect to become thoroughly masters of working the machine, so that it may be said that this year imposes a two-fold burden upon them. The probability is, that the odds are against the labourer in this respect; still they are not so far as at first sight might be imagined, for those who commenced last year will doubtless have much to learn this. Less will be to learn with Bell's machine, which delivers the corn in a swathe at the side, than with the American, which requires a workman to deliver it with a rake. In either case, however, the value of an intelligent labourer with an ingenious and mechanical turn will be duly appreciated; and the farmer who knows nothing of mechanics will be found a very bad instructor. "Time will tell its own tale" on these topics by-and-bye in every province. How far the success of Bell's reaper has depended upon qualifications of this kind, sufficient inquiry has not been made to do justice either to the workman or his master. In cutting with the scythe, how often do we see the workman ignorantly striving "against wind and tide," as it were, and blaming everything but his own ignorance for the bad work he is making! That the reaping machine may fall into the hands of some such men, and acquire discredit, is more than probable. In how many cases will the season get the whole blame! Again, how different is the scythe harnessed in the different provinces for "gathering the corn"—one using a "bow" of wood or iron; a second, a "sail" or "cloth;" a third, a rake; some cutting into the standing corn, some cutting out from the standing; and each party, man and master, condemning the practices of their neighbours in order to justify their own. Now we have taken the scythe out of the hand of each of these parties, stripped it of its harness, and shewn them in "standing corn," "lying

corn," "twisted," &c., &c, that better work could be made without these cumbrous appendages for gathering than with them, and at a very great saving of manual power or labour; consequently when scythe practice is such an anomalous affair under the tuition of experience for so long a period, what can be expected of the reaping machine but much prejudice to its general adoption, and condemnation of its work without in the slightest degree affecting its merits.

On the details of working the reaping machine our limits forbid notice at present; and, moreover, our object is rather to institute inquiry than afford information of this kind, in the absence of the necessary experience. Scientific discussion is not so much wanted as practical, but the two conjoined is the golden maxim.

The other topics are soil, climate, &c. In seed-time it is necessary to bear in mind the operations of harvest. Lands, for instance, must be rolled for the scythe and reaping machine, and open furrows as much dispensed with as possible: and even when provision of this kind has been made, crops grown on different kinds of soil affect the operations of harvest differently. Those grown on clay, for instance, stand differently up to the scythe or cutting-knife of the reaping machine from those grown on sandy and gravelly soils, and those on wet soils from those on dry, whatever way the crop may be standing.

Practice, as affected by diversity of climate in the different provinces, is still more deserving of notice. On the present occasion the late harvest of the south will approximate in some points to the early harvest of the north. For instance, wheat, barley, and oats are there tied up in sheaves. The practice of harvesting barley and oats loose could not be successfully adopted, as it is in provinces of the south, even in the earliest seasons, especially if the weather is fickle, the ground moist, and the atmosphere sultry and warm; and when tied up in sheaves it is no easy matter, often, under such circumstances, to secure them in the stackyard without injury. The task lies in getting the sheaves made sufficiently small, properly tied, set in stooks, and kept standing erect until fit for carrying. Barley and oat sheaves, from the softness and smallness of the straw, are more difficult to dry than wheat; and if soaked with rain, when large and tied tight, will rot before they dry in warm weather. They should not only be small, but loosely tied, so as to admit the free circulation of air through them, to carry off the evaporation. Necessity is the mother of inventions, it is said; and the unpropitious climate of many districts of the north has taught its farmers to pay particular attention to small sheaves, and late seasons as the present ought to establish the same rule in those of the south—a rule, in short, which ought to be carried out every year; for nothing can be farther from sound practice than to roll large armsful of corn together, and then kneel it into the band, as if purposely to keep it from drying!—which it actually does. We have often carried small sheaves ten days earlier than large, and that, too, not unfrequently when cut wet—the reason why they were made small. The practice takes a little more labour, but not nearly in proportion to the number of sheaves; and its value in fields surrounded with wood (as in this and the adjoining counties), in the moist climate of the west—from Cornwall to Caithness—and such like, cannot be estimated.

TRIAL OF SELECTED REAPING MACHINES.

The Royal Agricultural Society held their postponed trial of reaping machines at Pusey, on Tuesday and Wednesday, the 13th and 14th of August.

It will be remembered that at the Gloucester Show the judges selected out the six best reapers from amongst the twelve tried on that occasion, for further trial on Mr. Pusey's farm, at Pusey, Berks. On Tuesday, about ten o'clock, the trial commenced, in a piece of wheat, which was a good average crop, all standing, with the exception of a small patch or two. The machine manufactured by Messrs. Garrett and Son, which won all the principal prizes last year, was withdrawn, on account of their being engaged in making some important improvements upon it, so as to fit it to enter fairly into competition with Mr. Bell's self-delivering machine.

The other five machines—viz., Bell's, manufactured by Mr. Crosskill, of Beverley; M'Cormick's, by Messrs. Burgess and Key, London; Hussey's, manufactured and improved Messrs. William Dray and Co., London; M'Cormick's, manufactured by Mr. Samuelson, of Banbury; and Mr. O. Hussey, with his machine, improved and manufactured by himself—began operations according to order; but before some of them were ordered to start, the rain began to fall thick and light, but increasing in weight, until both stewards, judges, and exhibitors were literally drenched to the skin; indeed, several of the exhibitors remained with their coats off during the whole time.

The work done by all the machines was good, as far as the cutting went; but the delivery was decidedly in favour of Bell's. Owing to the circumstance of some of the machines getting through their work before the rain began, the judges did not place much stress on this trial, and spent the rest of the day in scrutinizing the principles and mechanical arrangements of the various machines.

Perhaps we may be allowed to pass our opinion on the various principles and mechanical details of these machines. The first principle to be considered is the power that insures the action of the working parts of the machine. This power lies in the weight upon the driving wheel or wheels, which we will first notice. Bell's machine weighs about 16 cwt.; M'Cormick's, inclusive of the two men riding upon it, about 13 cwt.; Dray's Hussey, inclusive of one man riding, about 12

cwt.; and Mr. Hussey's, inclusive of two men riding, about 12½ cwt. But there is another element to be considered, namely, the biting or holding power of the driving wheels. All these machines except Bell's had cogs or ribs crossing the rim of their wheels about six inches apart, and about an inch deep, to prevent the wheels from slipping. When at work these cogs or ribs we observed did great damage to the young clovers. When cutting the barley they also tended to clog when the land was wet. We therefore think that it would be better to do away with these cogs, and make the machines two or three hundredweight heavier, which we feel sure would be just as little draught for the horses as with the lighter machine and cog travelling-wheels. As far as this principle goes, it is in favour of Bell's machine, the weight being against him; therefore taking these two principles into consideration, we think their driving power at par, but give the decided preference to Bell's mode of obtaining that power.

The next thing that attracted our attention was the mode of attaching the horses, and the advantages accruing from each. Bell's is propelled by two horses, drawing from the end of a powerful pole, which is fixed to the machine, and passes down between the horses and projecting out behind them, where a set of common plough swingletrees are fixed, and by which the horses draw. To the end of the said pole is fixed a cross-bar, with a pair of handles, by which the man guides or steers the machine, over which he has great power when the machine is at work—as we observed the gentleman who managed on this occasion steering the machine to cut within two or three inches of its full width. This part we liked much, because we feel confident that every good ploughman will be at home when called on to work these machines.

This system of propulsion gives the power of going into the field and cutting the headland all round, then choosing which is the best direction to work, so as to accommodate the wind, the shape of the surface or the lay of the crop, then working back and forward, turning the swathes all one way, as a turnwrest plough does its furrows. This is an advantage of paramount importance in a hilly country, as well as on the plain, where the abundance of straw often causes the crops to be laid.

All the other machines were drawn at the side, by the horses walking alongside of the standing crop. When these machines have their wheels well arranged, they have the advantage of Bell's for crossing ridge and furrow, but are badly suited for cutting along the ridges, on account of the great distance the wheels are apart; indeed, these machines are inferior to those propelled, except for crossing high ridges or deep furrows—a description of farming that we hope will soon be erased from amongst our fields, by the landlords progressing with the drainage of their wet estates with that spirit which is now pervading our country; thus enabling the tenant-farmer to call into his aid all the mechanical contrivances that the ingenuity of the age brings into use to enable us to compete in the market of the world, and at the same time "live and let live."

The next point we observed was the principle of cutting used by each of these machines, which was of three sorts. First, the serrated cutter, working with a good draw cut, as in M'Cormick's: this is a first-rate simple cutter, taking rather less power than the clipping principle used by Bell; but it requires to be driven at great velocity as compared with Bell's clipper, therefore causes more tear and wear; however, M'Corimck's cutter is very much cheaper than Bell's clippers, and easier managed; it was therefore our impression at first sight that, if that cutter was applied to Bell's machine, it would be an improvement; but after we saw Bell's machine at work some time, we were convinced that there are very great difficulties in the way of carrying out that idea: in fact, when Bell's machine is cutting a six-foot swathe, there is above a foot thick of cut corn on the web at the delivery-side, and which is all supported by the cutters, which are above a foot long: but if M'Cormick's cutter was used, the length of which is but one inch, there would be no support for the cut crop, which would therefore fall down before the cutters, and press the uncut crop to the ground, allowing the machine to pass over it: then, it may be urged, that some space could be allowed between the cutters and the web to allow support to the cut corn; but when a very short, grassy crop came to be operated upon, the cut corn would fall on the said space, out of the reach of the web, thereby frustrating the power of delivery. We are therefore satisfied, that Bell's cutter and his delivery are members of a complete body, and, like bevil-wheels and pinions, cannot be parted, or used with any other differing in principle or make: and as the great objection to Bell's clipper is its price, we think, when these clippers will last for an ordinary lifetime, there cannot be much the matter.

The other description of cutter is that introduced by Hussey, which is on the chopping principle, therefore ill-adapted for cutting anything at all soft or elastic—which during last harvest did more evil to the rapid spread of reaping by machinery than will be got over for years. We heard that Crosskill was supplying his last year's customers with serrated cutters (the same as he used at the York Show) at a low price: and we would advise those parties who are wedded to the chopper, always to think of the serrated cutter when they are set fast with grass or damp.

The next thing to be noticed was the means used to bring the uncut crop into a proper position for the cutters to operate most efficiently. This, in Bell's and M'Cormick's, was accomplished by a fan or reel, revolving over and a little in advance of the cutters, bending the crop back, ensuring both the cutting and a good arrangement for delivery.

In those machines on the Husseyan principle, the man bends back the crop with his rake; and it is certain that a hand, guided by an eye of intelligence, could, under awkward circumstances, combat difficulties better than the fan; but, inasmuch as labour-saving is the order of science, patriotism, and philanthropy, the fan or reel must be the best.

The next thing to be considered is the mode of de-

livery, which was of three kinds. First Bell's, with its self-delivery, in a beautifully arranged swathe, by an endless web. This takes a good deal of power, as it has to travel at a considerable speed above the progression of the machine. Mr. Crosskill is deserving of great praise, for the simplicity and neatness of all the arrangements and details of machinery required to perform all the three actions, namely, the cutting, gathering, and delivery of the lightest or heaviest crop grown upon a farm. The mode of delivery adopted by M'Cormick is by a man raking off to the side, in parcels, for sheaves. This plan has the advantage of a farmer being able to cut without being obliged to move any of the cut crop, which is of considerable importance to those farmers who find it advantageous to leave their crop for some time untied up.

The mode of delivery adopted by Dray was very good indeed, and easy work for the man, and simple of management; indeed, we regretted to see so good a delivery impeded by a bad cutter; and if he had used a serrated cutter he would have run far closer, if not quite into the second place, at the Pusey trial.

In Mr. O. Hussey's machine the delivery was the same as that in ordinary use upon his machines; but he has made a similar arrangement of his machinery as that made last autumn by Messrs. Garrett and Son, which is a great improvement when the land is wet and cloggy, preventing the dirt from getting amongst the machinery. He also had two wheels in front, to support the machine; and as they were hung upon a centre, the horses guided them in their own track; therefore these wheels did away with the nasty side-draught that was observable in all the other machines, except Bell's.

After scrutinizing till satisfied, we repaired to Mr. Pusey's house, where we had an exhibition that we are sorry to say is not so often to be met with in the present age as that gone by, namely, the hall and home of the "Good old English gentleman, who, when he feasted all the rich, he ne'er forgot the poor." May Mr. Pusey long enjoy the health and happiness his praiseworthy exertions for the furtherance of agricultural improvement is worthy of.

On Wednesday morning, at ten o'clock, an immense number of noblemen, gentlemen, farmers, and others, had gathered together to witness the trial of the lion machines of the day, more especially as our northern brethren had brought their Bell's machine, the champion of above five-and-twenty years, to contest for the laurels our American brethren had so well gained during the last two years. Many American friends were present, also a number of foreigners from France, Germany, Prussia, and Russia, to see these trials carried out. They began about ten o'clock, on a beautiful standing crop of wheat, except a few laid pieces, where all the machines worked well; but after M'Cormick's machine had been beat in cutting along one end of his piece, and was observed by the judges to be passing on without cutting, they immediately went to Mr. Love, Mr. Crosskill's manager on the occasion, and asked if he could cut laid wheat? when his reply was, that he wanted to see the crop Bell's machine could not cut. The judges took him at his word, and directed him to cut the beforesaid piece; when he charged the machine right into and across the middle of it, working back and forward, to the surprise and satisfaction of all parties present. We were pleased to notice that the weight of crop makes scarcely any appreciable difference to its being cut. All the other machines had a trial on this piece of laid wheat, but did not work satisfactorily, except when meeting the lay of the crop. After this all the machines were taken to a piece of barley, laid all nearly as if it had been rolled, where, by the order of the judges, Bell's machine went down one side, and then right across the piece, and returned, cutting and delivering in a satisfactory way. This machine, to get under the crop, was obliged to be placed so low that the cutter twice caught hold of stones, which brought the horses to a stand; but all that was done was to take out the stones and start off again. This was a severe test of the strength of the reaper, which it nobly overcame.

All the other machines could make nothing of this crop, except Burgess and Key's. M'Cormick's, having failed, was lowered closer to the ground, when it cut tolerably well; but the delivery was bad. During the whole of these trials it rained heavily, which made awful havoc of the crop; but, through the firm and good-humoured management of Mr. Fisher Hobbs, the steward, the crowd was kept from doing so much damage as, from the unfavourable state of the weather, might have been expected. Indeed, Mr. Fisher Hobbs's management was everything that could reflect honour on himself, satisfaction to the exhibitors, facility, despatch, and power to the judges to come to just conclusions, and, therefore, greatly added to the prosperity and credit of the Royal Agricultural Society of England.

All the machines were ordered to a field of winter Beans, where the land was wet with rain but dry in nature. The crop was not heavy, with a good many broken-down stems. Bell's reaper again started first, and cut, gathered, and delivered beautifully, far excelling the scythe's work alongside. Burgess and Key's reaper was again the only competitor, but was still excelled by Bell's, although they made capital work.

Next a field of oats, a very heavy crop, just on the eve of being laid in several directions, in some places down. All the machines cut well here; but the cleanness, lowness of the stubble, and the beauty of the delivery by Bell's machine left the palm still in his favour; but the work altogether was very good, and the delivery satisfactory.

The next, and last, was a good fair crop of barley, with a thick crop of clover amongst it. Here all the machines soon stopped cutting, except Messrs. Burgess and Key's and Bell's, both of which worked in excellent style; but the self-delivery in a beautiful swathe by Bell's reaper showed off to the greatest advantage; and the whole voice of the spectators was, that for cleanliness, even and lowness of cutting, and excellency of delivery, Bell's far surpassed its American competitors, even although much improved by British genius. But it is but fair to state that M'Cormick's reaper proved itself an efficient and good machine; also that Messrs. Dray

and Co.'s machine only wants a better cutter to make it a very useful, cheap, and simple machine.

It has always been our pleasure to see how ardently, yet how good-humouredly, all the competitors carry themselves through these trials.

Pusey, Berks, August 17th, 1853.

In making their award, the judges regret that, having tested the reaping machines, at Gloucester, upon rye unripe, and consequently unfit for harvesting, they have been compelled, with the selected machines, at this adjourned trial, by two days of extreme wet weather, to test them upon corn in such a state as under ordinary circumstances it would not be cut; they, however, have given the different reapers as full a trial as circumstances would permit upon wheat, barley, oats, and beans; and, after carefully testing the merits of the different machines, have unanimously awarded the Society's prize of £20 to Messrs. Crosskill's "Bell's Reaper."

They also "highly commend" Messrs. Burgess and Key's reaper, upon M'Cormick's principle; and they "commend" Messrs. Dray and Co.'s reaper, upon Hussey's principle.

The Judges have the satisfaction of reporting that a decided improvement has taken place in the working of the reaping machines brought under their notice; nevertheless, they are of opinion that, by a combination of certain elements which exist in the various machines exhibited, there could be one produced which would surpass anything hitherto brought before the public, possessing the advantages of simplicity in construction, greater durability, lightness of draught, and reduction in price, and, at the same time, might be more easily managed by the agricultural labourer.

FISHER HOBBS, Steward of Field Implements.
CHARLES E. AMOS, Consulting Engineer.
HENRY J. HANNUM,
W. WOODWARD,
JOSEPH DRUCE, } Judges.

We are more than doubtful of the possibility of the combination referred to by the judges being within the power of mechanics to carry out, so as to insure the advantages they refer to; at least, we know it has been ardently tried, and failed up to the present time; and we fear that there will be more stop made to the speedy introduction of reaping by machinery by the above remark than the benefits arising from it will balance, especially when there are sound reasons for doubting the possibility of attaining that which is so desirable. A reaping machine upon some new mechanical principles, although performing three actions, will engross simplicity, cheapness, and so easy of being worked, that it can do more work while propelled over the land by two horses than the best fixed six-horse steam-engine can put through three actions while it remains fixed, and has the crop carried to it for the purpose of being thrashed, shaked from the straw, and separated from the chaff by a blower. We think that if our mechanical friends only reflect that Bell's machine will cut, gather, and deliver in a heavy crop of wheat, oats, or barley—as much as one of the best six-horse engines can thrash in the same time, the reaper being obliged to traverse the land at the same time—they will agree with us that it is one of the wonders of the age.

THE YORKSHIRE AGRICULTURAL MEETING.

SIR,—In reading the report of the trial of thrashing machines at the above meeting, in your magazine for Sept., I am sorry to observe that your reporter has taken a mistaken view of the real facts, and has thereby formed conclusions which are calculated to mislead the public in some important particulars.

I attended the meeting at York as judge of steam engines, and it formed part of my duty to direct the judges of thrashing machines as to the best means at hand of arriving at the power required by each machine for doing a given quantity of work; and I cannot admit that I so far deceived the judges as to direct them to a mode which would lead them to register the greatest amount of power against the lightest-working machine.

The mistake of your reporter has arisen from his imagining that with a given pressure of steam the engine would be of one power, whether it made 116 revolutions per minute, its proper velocity, or whether it made any other number of revolutions above or below that number; hence in the case he mentions, of Hart and of Hornsby, he supposes that the engines worked to the power of five and six horses, respectively, to make up the power he gives of 34.25 and 35.22 horses power, instead of 29.60 and 40.38 horse ower, as given to the judges.

As your reporter states that the results were wrong, "because *real time* was not taken into consideration," we will see how the account stands, taking his own *real time* as our data.

We will take the case of the machine exhibited by Mr. Hart. The *real time*, your reporter states, was 6.85 minutes, and that the engine ran 687 revolutions during that time.

Now 687 revolutions, divided by 6.85 minutes, equals 100.291 revolutions made by the engine per minute.

But the engine would not be equal to five horse power unless it made 116 revolutions per minute; and at 100.291 revolutions would be only equal to 4.3228 horse power.

Then, 4.3228 horse power multiplied by 6.85 minutes equals 29.61 horses' power to do the work in one minute, which agrees perfectly with the results obtained by taking the *mechanical time*, the latter being the more simple method, and rendering the appeal to the *watch* unnecessary.

Again, in the case of Hornsby, your reporter states that the *real time* was 5.87 minutes, and that it took 781 revolutions of the engine to do the work: this is equal to 133.04 revolutions per minute.

As the engine is equal to six-horse power, with the pressure of steam given to it during the experiment, at 116 revolutions per minute, with the velocity of 133.04 revolutions, it was equal to 6.881 horses' power.

Then, 6.881 horse power multiplied by 5.87 minutes equals 40.39 horses' power required to do the work in one minute, being near enough for all practical purposes to the result given (40.38 horses power) by *mechanical time*.

I do not assert that the results obtained were mathematically correct, for it may be argued that when the engine ran above its speed, the steam in the cylinder would not be equal in density with the steam in the boiler; but my experience of the engine under consideration assures me that the steam passages were large enough to prevent any serious discrepancy from the wire drawing off the steam by the increased velocity.

I am sorry that the pressure of business has prevented me from earlier setting the public right on this matter; and apologizing for this intrusion on your valuable time and space, I am, Sir, your obedient servant,

Grove, Southwark, Sep. 2, 1853. C. E. AMOS.

AN INCREASE OF MANURE THE BEST SOURCE OF "OUR FUTURE SUPPLY OF CORN."

The old proverb, "Muck is the mother of meal," is renewing its age—as it were, becoming more appropriate to the general exigencies of the country and the individual wants of the farmer than ever it was; it is for the want of "muck" that Britain is fearful of not getting the "18,000,000 qrs. of wheat" she is said to require for the current season, and that the English farmer ever experiences any difficulty in the balancing of his accounts satisfactorily at Lady-day. Hence the keen inquiry now being made after the golden treasure. A promise on the part of her Majesty's Government, that the guano discovery of Africa would receive its "very serious consideration," forms almost the last item in the "Parliamentary Intelligence" of the Journal for the session just closed; a promise which we hope will not be forgotten, owing to the paramount importance of the subject. The manurial resources of the country is at all times an important subject, worthy of the support of Government, but doubly so at present, owing to the peculiar position of Europe, many of her older states being now more dependent upon a foreign supply of breadstuffs than formerly. It is not, for instance, the amount of deficiency that exists in England which ought to create alarm as to a short supply being realized from abroad, but the demands of France and other states, whose increasing populations are gaining ground on their own productive resources; for England will experience little difficulty in getting 18,000,000 qrs. of wheat, and paying for them too; but from her liberal and commercial policy, no sooner has this supply come to hand, than it is sold to supply the demand of foreign states, leaving our crowded cities to depend upon the short supply of her provinces. Her commercial machinery is so organised, that she purchases a large proportion of the surplus corn of the globe, so to speak; but before her own inhabitants are provided for, all the world besides must first be served! Such is England's liberality, whose Government must consequently experience the home supply the most profitable in the long run; a supply which cannot be permanently increased without an increase of manure. Hence the conclusion.

The subject has a twofold view: First, as it affects our corn and cattle markets; and, second, as it affects our labour market, or the after expense of cultivating the soil. The latter branch we lately adverted to; but being unable to do it justice for the want of space, shall return to it in a separate article very soon. At present we shall confine our observations to the former—an increase of manure to effect an increase of produce.

The manurial resources of Britain are, if possible, greater than her demands, were they properly farmed. This, however, is far from being the case either at home or abroad; for the fact is notorious that the elements of millions of tons of manure are annually wasted from the homesteads and dunghills of our farmers and the sewers of our manufacturing towns; while large deposits of guano cover the islands of the Pacific and Indian Oceans, South Sea, &c., and also fill caves of the Indian Archipelago, &c., only requiring of our seafaring men and travellers to cast their eyes around them to make the desired discovery. The brown-stout from our homesteads, and sewage from our manufacturing towns, will not flow upon our hungry soils of their own accord, much less guano from the southern hemisphere. A national effort must be made before an increase of produce can be obtained from either of these sources.

The proposition, "Were the sewage matter of towns and the liquid manure now wasted from our homesteads applied to the British soil, the increase of produce would render us independent of foreign corn," has often been enunciated; but the grand problem of its application has yet to be solved. Of the soundness of the proposition itself there cannot be a doubt, for the waste of manure from both sources exceeds calculation. Estimating the value of the sewage matter of towns alone at the rate given for it by the farmers of the continent of Europe only, leaving no profit to themselves, the produce must exceed 18,000,000 qrs. of wheat before it would cover the expense. Now, the probability is that their profits exceed the prime cost of the manure; at all events, the increase of produce must not only cover the prime cost, but also all the increase of expense incurred in the application of the manure, as well as the harvesting—an increase which certainly falls little short of the prime cost itself. It will not be too high an estimate, therefore, if we set down the increased value of the produce at £3 per head on our urban population; so that the sum total may be given in round numbers at £50,000,000 annually. Britain neglects a source of wealth equivalent to this sum, annually, by allowing the sewage of her towns to flow into her rivers!

It is next to impossible to approximate to an estimate of the loss sustained from the waste of manurial elements upon the farm. In not a few cases, more than the half of the urine of cattle is lost during the winter season, and little less during summer, while a greater loss is sustained of gaseous matters from the fermentation of solid manures by exposure to the influence of the weather in its application, and by putting it into wet soils, and the like. The urine of a cow has been estimated at £4 per annum, according to the present price of guano; and it probably may not be very far from the truth if we set down the general loss at the one-fourth of the value of the urine, or about £1 per head; consequently, if we take the value of the produce at twice that of the manure, it would give a total increase of nearly £20,000,000 annually in value!

These are not the only sources of manure at present neglected; for our peat bogs, coprolites, and a long list of articles of this kind, are turned to little better account.

No doubt, peat charcoal can be had in any quantity at 50s. per ton, and the other articles at equally exorbitant prices; but such prices place them beyond the reach of farmers, consequently proving that our manufacturing interest has not discovered the necessary means to render them available to agriculture. It is the expense which excludes the application of the sewage matter of towns and liquid from the homestead. Had they been conveyed to the field, and applied at a cost of about half the value of the increase of produce which they would yield, they had long before now ceased to be a source of pestilence to both town and country. We have tried experiments with wood charcoal and peat charcoal, but their prime cost left us no profit, but in many cases a loss. We have often thought that if peat charcoal could be had at 20s. per ton—a price which we hope to see it yet manufactured at, leaving a fair profit to the landlord and manufacturer—it could be profitably applied as an absorbent in the straw-yard, feeding-box, and stall, along with cut straw, for using up the whole of the liquid, or yet separately with the liquid by itself, for being drilled into the soil along with the seed for turnips and other crops.

In sandy or clay soils, or any soils defective of vegetable matter, we aver that the increase of produce would remunerate the farmer on such terms; but the present prices make even an experiment itself speculation too gross for him to embark in; for his profit comes only once a year, and therefore must not only be sure, but of some considerable amount, before it will justify the investment of capital.

The high price of guano proves its management to be only a degree better than that of peat charcoal and other articles, now selling at double the prices they ought to do in order to do justice to the farmer; for, much as has been said about the monopoly of Peruvian guano, it is, after all, the cheapest guano in the market, and has every appearance of being so—facts which speak for themselves requiring no other argument in proof of our proposition. To blame Peru for selling the cheapest guano in the English market is, to say the least of it, anything but neighbourly towards a foreign state. Before attempting to take the mote out of Perus' eye in this way, England should pull the beam out of her own; for when she sells her African guanos and her own artificial guanos cheaper than that of Peru, then we shall have an effective argument for the Messrs. Gibbs and Son, before giving a fresh order—one which will not require to be repeated.

Such, therefore, being the neglected state of our manure trade, both home and foreign, we next come to consider how a little progress in the "march of improvement" can best be effected: how the liquid manure of the farm and the sewerage of towns can be applied to the soil advantageously, so as to leave a profit to the farmer; and also how we can best turn to advantage any deposits of guano which may exist on islands of foreign seas which Government may secure.

It has already been shown that the great obstacle in the way of practice is expense; consequently, before noticing the means to be used for reducing the expense, it will be necessary to glance first at the level to which the price of manure should be reduced. What is the price, for instance, at which farmers should receive artificial manures, in order to obtain a profit, and maintain the soil in the highest degree of fertility?

Our limits will not allow us to enter upon the details of this comprehensive question at present—suffice it to say that it is the poverty of the soil which enables the farmer to give the present exorbitant prices; and that, were the soil in the highest degree of fertility, such would not be paid. Experience proves that, when the soil contains an abundance of ammonia, "guano won't pay;" and that, when it contains a sufficiency of superphosphate of lime, "bones won't pay." In such cases, farmers cannot give more for the raw materials than what they receive for the manufactured article. In short, if we suppose the liquid manure of the farm, sewage of towns, &c., successfully applied to the soil, they would amount to about 20,000,000 tons annually; and if this quantity were offered in the manure market, in addition to the present supply, ammonia would sell at something like twopence per pound, instead of from fourpence to sixpence, as at present, and phosphates and alkaline salts at one farthing, instead of from three-farthings to one penny. Such, then, is the natural level of price, the increase being the result of prodigality or waste.

Now, such being the prices, it is manifest that considerable progress must be made in chemistry and mechanics before they are attained; for at present ammonia from those sources costs silver pence, instead of copper, whether delivered in a liquid form or solid. No manure company, for instance, or patentee, can undertake as yet to deliver it at the above price; for liquid manure theories and solid manure theories alike fall to the ground as impracticable, in the face of such a proposition.

Every step in the progress of chemistry and mechanics is an invention; and there are only three ways proposed to promote progress here, one or other of which we must adopt. 1st, By patents; 2nd, public grants; and 3rd, if the inventor allows the public the benefit of his invention for nothing, gold will flow in at the door upon him some how or other!

In order to illustrate the subject so as to avoid the charge of theorism in the absence of the necessary discovery and its reduction to practice, let us suppose that A has made the desired progress in those sciences, and is able to deliver upon the land, from our sewage and other sources already mentioned, 20,000,000 tons annually, at 35s. per ton—equal to £35,000,000 in value—and that this dose will increase the produce £70,000,000, leaving a profit of £35,000,000 to the farmer and landlord. The above 20,000,000 tons may either be applied in a solid form or liquid, as with the liquid-manure drill or hose and jet, and if the latter are exclusive of any excess of water; in short, the 20,000,000 tons are portable. And let us farther suppose that a discovery which would increase the produce of the soil £70,000,000 annually should be worth to the discoverer £1,000,000 at least. Then, according to the first pro-

position, he would receive this sum from those who used his manures during the term of his patent—those who received the £70,000,000 of produce; according to the second, he would receive it from Government in one sum, minus discount for money advanced; and, third, it would come flowing in at the door upon him somehow!

Of these three, the patent-law theory is obviously the sound one; and as such, has been adopted by almost all civilized nations in one form or other. There is considerable diversity of form from reformations lately made by various governments; but the only question which demands an answer of us at present is this, Do the English patent laws give the necessary encouragement to obtain the desired progress in chemistry and mechanics? And here we have little to do, for the Parliament itself answers in the negative: all parties being agreed that the patent-law question is not a settled one, so much so that there is every reason to believe it will occupy a prominent place next session, and that patents will be made available to the poor man as well as the rich, as in America.

The second proposition, although plausible, cannot successfully be carried out; because the value of the majority of inventions is affected by new discoveries. We have, for the sake of brevity and plainness, for instance, supposed the above 20,000,000 tons of manure annually as the result of one discovery; but in practice it may more probably be a thousand, each invention being only worth £1,000; but, until the second discovery is made, the first may be worth, say £100,000, and the second £200,000 until the third discovery is made, and so on; each successive discovery reducing the previous one to £1,000. Now how could the Patent Office know this? Hence the upshot.

The third proposition is too absurd to require refutation, and we are only sorry it should ever have been enunciated, so as to call for notice. It was its impracticability at first which gave rise to patents; for if inventors had been better paid prior to the existence of patents than they have since, it is manifest that the patent laws would have become a dead letter long before now. In point of fact, they would never have existed.

The discovery of guano islands is a very different thing from the discovery of chemical and mechanical means for applying the liquid manure now wasted from our straw-yards and manufacturing towns to the soil successfully; for the discovery of a guano island is not an invention, and therefore cannot be brought under the control of the patent office. It is a question for Parliament to dispose of according to its merits, and probably the most successful and economical course would be for Government to send out some of our idle war steamers to cruise in search of deposits where likely to be found. It is only in comparatively dry climates, such as Peru, that guano is likely to be valuable, or even worth conveyance to England. We fear much of the late discovery on the east coast of Africa will do little more than pay the freight, if it even does that; but "the best proof of the pudding is in the eating," for, as Dr. Anderson justly observes, the stock may be richer than the samples analyzed. We sincerely hope it will, and that Government will succeed in securing the islands for Britain.

Such are the two sources from which an additional supply of manure may be had, and such the means necessary to obtain it. By far too little importance has been placed upon the manurial resources which England enjoys within herself, and by far too much upon foreign, comparatively speaking; for those who dream that a sufficient supply of guano can be had from Peru, or anywhere else, form but a very imperfect idea of the demand which the British soil now makes for manure, and of the manurial question *in toto*. The home supply—the 20,000,000 tons of artificial manures—is the farmers' best friend, and we recommend it to his more serious attention; only let it have plenty of ammonia at 2d. per lb., and phosphates at 0¾d. per lb. Patentees must not dream of more from free trade prices. B******

PATENT FISH GUANO.

"Whatever happens to be really wanted in this country," says the practical man in the play, "you go into the city, knock up a company, and the thing is done." The genius of speculation shrinks from nothing, however difficult, or unattainable at first sight, may appear some of those objects it undertakes to accomplish. It would settle the dome of St. Peter's in Trafalgar Square, did the public really evince any inclination to have it there. It *has* moved the Palace of Industry some ten or twelve miles with just one push from its strong arm. Under the same genial influence our cities have light, fire, and water. The very supply of our food is more or less dependent upon it; while the bold spirit which shortens space and brings remote regions into daily converse with us, becomes only yet more energetic from that it has achieved. It might people the Essex marshes with Aztics, did it appear politic to encourage the increase of so peculiar a race. It would guarantee the working of the gold diggings, had we any great doubts as to justice being done there by private enterprise; or it would grow Peruvian guano on the coast of Ireland, if we found any inconvenience in still obtaining it from the original sources.

This last feat, indeed, the genius of speculation is now seriously intent on. We have a prospectus lying before us, with nothing less than this as the object of the company. The thousand pounds of the Royal Agricultural Society has done much already. It has set men a-thinking, and tended surely, sooner or later, to open a market

that was only as close as it was badly managed. Our ships range the seas keenly alive to the importance of any new discoveries they may make; while landsmen ponder on the possibility of finding something here at home as good as that we now send so great a distance for, and that is doled out to us in so niggardly and so ungracious a manner.

Of all the new discoveries said to be made, or of all the many companies announced as about to make up the deficiencies of the manure market, none yet has received so much attention as the FISH GUANO patent of Mr. Edwin Pettitt. It comes before us, too, with certainly something of a favourable introduction. Its composition is clearly shown to be identical with that article it is intended to supersede; while its continued manufacture is assured by the supply of the same almost-inexhaustible material. It has, moreover, should it at all succeed as a speculation, this further to be said in its favour—that it will benefit not only the producer or employer, but the country generally. The working of such a patent would afford increased employment for the people, and rescue to our use an immense amount of valuable matter at present altogether wasted.

We subjoin some correspondence on the nature of this invention, and the manner in which it is proposed to carry it out. The important interests involved in its success, and the really practical and genuine character of the scheme, will warrant us in pursuing this a little further. "Guano," then says Mr. Pettitt, "is simply fish, which, having undergone decomposition in the stomach of the sea-bird, is deposited on the barren islands of the Pacific to dry." His own patent, we are next assured, "is also simply fish, which, having been decomposed by chemical solvents (instead of as above), is dried by artificial means."

These are the premises of the invention; and on these arise, amongst others, the consideration of two, more especially, pertinent queries: Can manure be made under this patent, which shall be of use and real value? And can the raw material (fish) be obtained in sufficient quantities to support a manufacturing business? The first of these is answered by the analyses of Mr. Lewis Thompson, consulting chemist, and Professor Way, of the Royal Agricultural Society. Both of these gentlemen speak highly of the samples submitted to them; and Professor Way adds to his professional separation or division of its qualities, the opinion that "it is a good manure, and would have an abundant sale if produced at a sufficiently low cost."

The efficacy of the patent will, of course, have to be yet tested by still more practical proof. To this we must leave it, and proceed now to consider, in the event of its success, to what extent it can really be supplied? As a simple point of fact, we shall take the answer here from the pamphlet before us. It runs to some length; but is so suggestive of the uses to which the matter it treats on may be brought, that we prefer giving the passage entire:—

"This paper having reference to Ireland, I will not enter fully into the statistics gathered during the last year on the coasts of England, Newfoundland, and Labrador, and at the great Norwegian fisheries. Doubtless analogy goes some way, however; and it is a fact that fish may be bought at the established fisheries on the English coast (where labour is dear, population great, and money plentiful, where the market for eatable fish is large and seemingly never overstocked), at a price which has justified persons of capital and judgment in embarking in the business, namely 30s. per ton.

"I find also that hundreds of shiploads of fishy matter may be obtained from the colonies of British North America and from the Loffoden Islands in Norway, almost for the carriage. And I principally draw my conclusion that abundance of fish for the purpose may be found on the coasts of Ireland, from a very large and elaborate blue book prepared for the House of Commons on the subject of Irish fisheries in the year 1836, corroborated by evidence collected from gentlemen in the Coast Guard service, and others resident in Ireland at this present time.

"It appears, from the printed evidence, that the whole western coast of Ireland swarms with fish.

"That seals abound, now useless except for skin and liver.

"That whales annually visit the coast; and many thousands of large sunfish, or basking sharks, from 20 to 40 feet long, are now useful for their livers only.

"That thousands of barrels of the waste of the fisheries (the most nitrogenous parts) are annually thrown away at the curing stations.

"That there are 44,000 Irish fishermen who have not more than half a year's employment.

"That, from the wonderful reproductiveness of fish, it is practically impossible to exhaust the British, much less the Irish Atlantic waters.

"That trawl boats usually throw overboard dead fish, weight 1½ or 2 tons for every one ton now taken to shore.

"That there is no doubt of the fish being obtainable on the Irish west coast, say Galway, at a less price than 30s. per ton, at which price can be secured large quantities (and, for the purpose, of the best quality) in England. And although the manufacturer can afford to give £2 10s. for each ton of fish, it is not to be supposed that it will cost so much for some time to come, if bought with judgment and properly collected.

"I have drawn my conclusion, that enough fish can be found, from evidence chiefly documentary, which can always be produced if required."

We know nothing of Mr. Pettitt himself beyond that his letters and pamphlet inform us. The letter, indeed, appears not to be written by him, but, as we assume with his authority, by Mr. Horace Green. It is not, however, with men but measures we have to deal; and the manufacture of the patent fish guano bears sufficient promise on the face of it to call to it our best attention. Whether this scheme be found to answer or not, there is a fine field open for the man of science and the man of business. The material and the market

are alike inviting their services, with every promise of a fair profit to those who give them.

We repeat, with a *fair profit*. To Mr. Pettitt, as we learn from his own account of himself, "although an inventor, strange to say, profit is a secondary consideration." That is to say, as we further gather, his great aim is to break through the Peruvian monopoly—And by this means—that he would keep the price of that manure just as high as it is now. At any rate, he seems desirous to do so in one part of his letter, and falls foul of the Royal Agricultural Society accordingly. Towards the close, though, we are glad to find we are to have "as good a quality at a very much lower price." There is something rather contradictory here. Does Mr. Pettitt assume that, with all these inventions and new deposit-discoveries crowding on us, that the standard price of guano is to remain where it is now? If so, the benefit, after all, will be in many respects but questionable, and we shall still want the grand recommendation of an open market. The thousand pound prize of the Society, as we take it, was never meant to make one man's fortune, without some proportionate benefit to the community. Whether profit be, or be not "a secondary consideration" to Mr. Pettitt—and we confess that we do not put much reliance on so disinterested an avowal—we counsel him not to lose sight of the advice so quietly conveyed in the letter he quotes from Professor Way—"This manure may have an abundant sale, if produced at a sufficiently low cost."

THE GUANO QUESTION.—A SUBSTITUTE.

The question as to the possibility of obtaining supplies of guano from new sources, to render our agriculturists less dependent on Peru, has during the past week or two attracted renewed attention. On the 26th Aug., Mr. James Caird, in a letter to the *Times*, announced that an immense deposit had been discovered in the Indian Ocean, between Mauritius and Calcutta, the quality resembling that obtained at Saldanha Bay, at the Cape of Good Hope. This led to a question being addressed, a few nights back, to the President of the Board of Trade, in the House of Commons, as to whether the Government had received any information on the subject, which was answered in the negative. At the same time, it was stated that the British squadron in the Pacific had received instructions to lose no opportunity of prosecuting a search in that quarter. Subsequently, Mr. Bell, of Edinburgh, by whom the samples of the new discovery seem to have been received, has published the analyses of them by Professor Way, of London, and Professor Anderson, of Glasgow, to the effect that they appear at least equal to the guano from Saldanha Bay, and are highly deserving of importation. Meanwhile, the precise situation of the new islands is not given; nor is it stated what steps are likely to be taken for obtaining cargoes from them; and until something definite is arrived at in these respects, the public, who have been so often excited by accounts of similar discoveries, which have ended in nothing, will not attach much importance to the matter. The case of the Seychelles Islands, which lie, like those now announced, in the Indian Ocean, although not exactly in the same track, and which, about two years back, were alleged to have been reported by the resident commissioner as possessing an inexhaustible supply that would probably prove of great value, is an illustration in point, since no subsequent particulars respecting them have transpired. At the same time, the supposition that other spots at least equal to Ichaboe and Saldanha Bay must exist in abundance cannot be discarded, and will continue to keep up an anxious degree of expectation, until Peru shall have had the wisdom to break down their present mode of exportation, or the people of England shall have resolved to employ the better materials derived from the drainage they now permit to run to waste. Evidences of the keen interest which the subject is exciting, both as regards the discovery of natural guano and the production of an artificial substitute, have been furnished, moreover, within the past few days, by a communication in the *Times* from Mr. Earle, quoting a variety of authorities to lead to the inference that large quantities of many fine descriptions may be found in the neighbourhood of Burmah, as well as in numerous parts of the Indian Archipelago; and also by the publication of a scheme for the manufacture of an analogous manure from fish, on the Irish coast and elsewhere, under a recent patent. In the latter case, the projector remarks that guano is simply fish which, having undergone decomposition in the stomach of the sea-bird, is deposited on the islands of the Pacific to dry, while the patent guano is also simply fish, which, having been decomposed by chymical solvents, is dried by artificial means. In this case, also, analyses are furnished of a very favourable kind; and it is asserted that, looking at the endless supply of fish on the coast of Ireland, and the quantity thrown away annually at the curing stations, to say nothing of the shiploads of fishy matter that may be obtained from the colonies of British North America, the Loffoden Isles, Norway, &c., almost for the carriage, an article of the value of £9 per ton could be manufactured in any quantity for £4 17s. per ton. That this estimate will turn out as delusive as the majority of those which accompany such proposals, is almost more than probable, especially as the inventor does not appear to have claimed the £1,000 prize offered by the Agricultural Society of England for a substitute for guano; but its accuracy or otherwise must be capable of easy solution, and it would seem reasonable, amid all the search that is making elsewhere, not to neglect such simple means as may be necessary to arrive at it.—Times, Aug. 22.

The importance of the guano question at the present time seems to be fully appreciated in all parts of the kingdom, and there is scarcely a subject that draws forth more abundant communication the moment it is touched upon. With regard to the production of substitutes for this manure by scientific means, Mr. Pettitt, the inventor of the fish guano, has sent a statement, which is subjoined, giving an apparently satisfactory explanation of his having abstained from seeking the £1,000 prize of the Royal Agricultural Society; while, as respects the injurious and short-sighted policy of Peru in her mode of exportation, a correspondent has furnished a translated extract from the Lima paper *El Commercio*, showing that the attention of the Peruvian people has been called to the point on behalf of the persons interested in this country. The *Liverpool Times* also has just published some statistics, illustrating the increasing demand for the article, and the fall-

ing off in the arrivals from bad management. Mr. Pettitt writes as follows:—

"Sir,—In the City Article of to-day, in an allusion to the manufacture of fisheries guano, lately patented by me, the following passage occurs—'that this estimate (of cost of production) will turn out as deluaive as the majority of those which accompany such proposals is almost more than probable, especially as its inventor does not appear to have claimed the £1,000 prize offered by the Agricultural Society of England for a substitute for guano.'

"Accompanying this note, I have the honour to hand you two samples of the fisheries guano, to enable you to judge of its merchantable form, and also the original letters of Professor Way and Mr. Lewis Thompson, from which you may verify my statement of the chymical, *i.e.*, the market value of the article.

"I am free to confess that inventors generally overstate the value of their discoveries, and that the profits I state will accrue from this new trade are very large; yet I beg to assure you I have taken my *data* from an elaborate blue-book, the result of the labours of the Irish Fisheries Commissioners, and from personal and practical experience on our own coasts. And as, on the one hand, I challenge, with confidence, a comparison of this patent guano with that of the Peruvian monopolists, so, on the other, I respectfully invite Mr. Caird, Mr. Earle, Mr. Bell, or any other gentleman or scientific body, to a strict and careful examination of the whole matter.

"I have not claimed the £1,000 prize offered by the Agricultural Society, because the offer is not a fair one. As a proof, I will just state two of the conditions attached to this prize:—

"1. That the substitute shall be equal in fertilizing properties to Peruvian.

"2. And be sold at a price not higher than £5 per ton.

"Would it be a prize to me to receive £1,000 on condition that I sell an article at £5 when its ascertained market value is £9 per ton?

"If the society will withdraw the last condition I will present it with a £1,000 prize if, in the face of the country, it can refuse me the £1,000 offered for a substitute for guano.

"Although an inventor—strange to say—profit is a secondary consideration with me in this matter. My aim is to pluck, by scientific means, at least one feather from the Peruvian bird; a dozen new islands of Saldanha quality will never do this.

"Besides, why should we send our ships thousands of miles for an article while we have unlimited supplies of it swimming about in our own seas? Why send our gold to Peru, when it might be so profitably spent in doubling, nay, quadrupling, our fisheries at home, in rearing sailors for our fleets, and in fertilizing our lands with a home-made article?

"Give me a fleet of fishing-boats and I will make as much guano in twenty-four hours as the myriads of Peruvian birds will make in a year; of as good a quality, and very much lower in price.

"As a practical man, I am ready at any time to give every information I can to those interested in the guano question, being convinced that the patent article must sooner or later stand or fall upon its merits. If it is worthy, it will stand without prizes or puffery; if not, it will fall without kicking.

"I have, &c,

"145, Upper Thames street, Aug. 23." "EDWIN PETTITT.

Annexed is the paragraph referred to, from the Lima paper, containing the statement received there regarding the position of the English supplies, together with the statistics from Liverpool:

"Messrs. Gibbs and Son, of London, are now offering £4 for guano home; but there is every reason to believe that they must shortly advance their rates. England is at present entirely destitute of supplies; and the conduct of the agents in London is a subject of severe animadversion by both the shipping and agricultural interests, the want of supplies being prejudicial to these interests, as well as to the interests of the Peruvian Government. At present, the reply given by the agents to all applicants is, that they have no stock on hand, and that they cannot hold out any prospect of being able to meet the demands of even their usual customers. All this arises from the absence of a proper liberality in regard to freights, which ought to have been advanced long before they were. Surely, if the Peruvian Government knew and understood their interests better, such a state of things would in future be avoided, by a more timely offer of reasonable terms to the ship-owners. The importation of this manure for 1852 fell short of that for the preceding year by 100,000 tons. The agriculturist must, of course, now look out for a substitute, which is not only a present positive loss to the Government, but a prospective disadvantage, inasmuch as the niggardly course pursued in securing tonnage in this country has shaken all confidence in future supplies. It would be well to try to sound the Peruvian Government as to their feelings on this question."

"IMPORTS AND CONSUMPTION OF GUANO.

"A calculation has been made by importers that the consumption of Peruvian guano in Great Britain is now from 190,000 to 200,000 tons a-year, and the increase is said to be from 15 to 20 per cent. annually. Scotland consumes largely, but Ireland very little. At present, the unrestricted system of adulteration operates greatly to its disadvantage. The imports into the United Kingdom during the last five years have been as follow:

	Tons.
1848	71,415
1849	83,438
1850	116,926
1851	243,014
1852	129,889

"The countries from which it was imported, and the quantities brought from each, last year, were as undernoted, 36,247 tons of which were re-exported:

	Tons.
Peru	86,293
Chili	11,191
Patagonia	7,282
South Africa	7,273
Bolivia	6,213
West coast of Africa	4,192
Uruguay	1,575
East coast of Africa	1,363
Buenos Ayres	932
China	790
Australia	727
Asceusion	705
Brazil	650
Eight other places	703
Total	129,889

"The imports of guano into Liverpool since the commencement of the trade have been as follow:

Years.	Peruvian. Tons.	Bolivian. Tons.	Chilian. Tons.	Ichaboe. Tons.	African, &c. Tons.	Saldanha Bay. Tons.	Patagonia. Tons.	Australian, Shark's Bay. Tons.	Total. Tons.
1841	1,241	400	437	—	—	—	—	—	2,078
1842	6,726	3,385	557	—	—	—	—	—	10,568
1843	1,278	—	539	—	—	—	—	—	1,817
1844	9,067	5,163	589	22,553	1,630	—	100	—	38,916
1845	4,420	7,189	551	80,427	7,570	14,910	8,500	—	115,120
1846	10,696	3,525	2,490	120	1,418	800	2,770	—	27,549
1847	19,895	4,120	1,650	—	553	—	300	—	29,988
1848	11,195	2,330	380	—	870	—	—	—	15,075
1849	17,635	751	1,532	1,120	1,511	220	795	—	23,554
1850	14,705	3,810	1,035	3,540	2,846	1,416	1,790	—	28,472
1851	63,154	8,267	500	3,535	989	2,72-	3,823	4,750	92,593
1852	11,470	4,321	—	2,800	333	2,403	1,375	—	22,722

"The stocks of Peruvian in this country are now stated to be almost *nil*; and of the inferior sorts, altogether, not more than 10,000 tons, one moiety of which is housed in the port of Liverpool—say 5,000 tons, value £40,000. The imports of last year appear to have been in value £180,000. The imports of the present year, so far, are a mere bagatelle."—Times, Aug. 23.

TESTIMONIAL TO JEREMIAH SMITH, Esq.

On 18th August, the town of Rye was in a perfect state of excitement, consequent on the presentation of a testimonial to Jeremiah Smith, Esq. It was a handsome and massive service of silver, which is best described by the following inscription, which was engraved on a large dish under the arms and crest of Mr. Smith:—

"This salver, with four side dishes and a soup tureen, was presented to Jeremiah Smith, Esq., of Springfield Lodge, at a public dinner holden at Rye, on Thursday, the 18th day of Aug., 1853, by the friends and supporters of the liberal cause, and other admirers of Mr. Smith, as a tribute of respect, esteem, and regard for his faithful and consistent adherence to the principles of civil, religious, and commercial freedom, his private worth, his independent character, and his unwearying attention to local interests."

The value of the plate was said to be about £500.

At the dinner, T. B. Brockett presided, and after the usual loyal toasts, previous to the presentation of the plate to Mr. Smith, the Chairman said he hoped it was quite unnecessary for him to say anything to the gentlemen he saw before him with regard to the gentleman whose health he was about to propose (cheers). He could not do better, in endeavouring to express his sentiments, than read the address of the subscribers, which he knew was concurred in by all present who were not subscribers (Hear, hear). It was as follows:—

"To Jeremiah Smith, Esq., of Springfield Lodge, Rye. On behalf of a numerous body of influential subscribers, friends, and supporters of the Liberal cause in Rye, and the electoral districts, and other of your personal friends and advisers, we, the undersigned, being the committee appointed to carry into execution the purposes of this testimonial, have great pleasure in presenting the same for your acceptance, consisting of a salver, four side dishes, and soup tureen; and at the same time to assure you, in the name of the subscribers, one and all, that we are deeply sensible of the kind interest you have ever taken in all our local matters; your time, your influence, and the energies of your active and comprehensive mind, having been always at the service of your townspeople, and that irrespective of party or from any personal motives. For your steady and consistent support of these principles of civil, religious, and commercial freedom which now happily form a part of and radiate the British constitution, we know that your reward is in the progressive advancement of the people (cheers), the education of the masses (continued cheering), and the prosperity of all (loud applause); that your uniform courtesy to all classes of society in the impartial discharge of the numerous responsible situations which you fill, has been such as to obtain the respect and esteem of most persons, and to secure the friendship of many (Hear, hear). In conclusion, we trust that, under Divine Providence, you may long be spared to this neighbourhood to stimulate others in that career of general usefulness which we have feebly endeavoured to pourtray; to watch over the rights and liberties of our ancient town, and to enjoy all those blessings to which a conscientious and upright discharge of all the varied duties of life have so justly and eminently entitled you" (much cheering).

He had now to request Mr. Smith to accept from the subscribers, and not only from the subscribers, but from those who were not subscribers, the service of plate that was then placed before them on the table (Hear, hear). He proposed Mr. Smith's health, with 3 times 3 (given with enthusiasm).

Mr. Smith, on rising, was received with loud and repeated applause, on the subsiding of which he said—Mr. Chairman and friends, I rise overwhelmed with gratitude, and I can assure you my heart is too full to enable me to give utterance to my feelings on the present occasion. When I see hundreds of my friends assembled, as I now do before me, to testify their approbation of my conduct, it humbles me to the very dust (Hear, hear), feeling, as I do, I have done no more through life than every good citizen should do (Hear, hear). And when I behold your noble, massive, and handsome present of plate, it causes a debt of gratitude which quite overpowers me (cheers). When I look upon this magnificent present, rest assured I shall always feel the most lively gratitude towards you (Hear). It will ever cause the spring of affection to rise within my breast; and so long as I live, I trust my anxiety for the well-being of the masses of the people will never lessen (Hear, hear). And may the day never arrive when I may in any way forget your regard and esteem (applause). To those gentlemen of the committee who have so successfully laboured in carrying out this great undertaking, I feel I am under especial obligation: I beg to tender them my warmest thanks (Hear, hear). Again begging to thank you, my friends, from the very bottom of my heart for all your kindness towards me, this being intended as a day of joy to myself, I can assure you it is so; and I have no wish to refer to anything that should cause any other feeling; and I will only add that on the late occasion my feelings were more distressed on behalf of my friends than on my own account, being anxious to avoid any exposure to them by the abstraction of my books and accounts. It is true my fatigue and suffering were very great; but after all, I hope I am the only party that suffered by it (cheers). I wish you all good health (renewed applause).—*Abridged from the Sussex Express.*

ON THE CULTIVATION OF WHEAT.

QUARTERLY MEETING OF THE SPARKENHOE FARMERS' CLUB.

A quarterly meeting of this club was held in the Town Hall, Hinckley, in the past month; Mr. J. Chapman, the president of the club, in the chair. There was a very large attendance, the hall being completely crowded. After the election of forty-six new members, the president introduced the lecturer, Mr. Baker, of Writtle—"On the Cultivation of Wheat."

Mr. BAKER, in commencing, said he had been engaged in agriculture many years, and most cheerfully responded to the invitation of the President of the Sparkenhoe Club to appear before them, to discuss the cultivation of the most important of all plants, the cultivation of which might be traced to the earliest history of man, and was grown in all countries. In the time of the Egyptians probably but one kind of wheat was cultivated; but botanists had now divided it into thirty species. Some of the wheat at present in cultivation was the same as that grown in Joseph's time, as the seed had been taken from mummies, after having been kept for three or four thousand years. Although there had been as many as thirty varieties cultivated in England, only three were so to any extent, viz., the red, white, and bearded. Columella, who wrote about the time of Christ, preferred the red wheat in wet seasons, because it excelled in weight, and was brighter; whilst the white ripened sooner, but was lighter. The Talavera wheat is one of the earliest and most valuable varieties of white wheat; but it is extremely delicate, and sprouts in wet seasons more quickly than other varieties. The Taunton Dean is another valuable variety; and the velvet chaff, or, as it is termed, "rough chaff," is extensively grown in the heavy clay districts of Essex, Kent, and Suffolk. The latter in dry seasons, on suitable soils, yields abundantly, but is liable to mildew. In one instance that came under his observation, 104 acres yielded 635 quarters. That description of wheat having its grains long and taper was most sought by mealmen, of which the three above described are types. That having round-shaped grains similar to the Chittam, Hardcastle, Golden drop, Thick-set, &c., were, on the contrary, less esteemed. The former contain the largest proportion of gluten, the latter less gluten and a larger proportion of starch. The gluten is a tough, viscid substance, that is valuable in causing the loaf to rise well in the oven after fermentation, and consists of nitrogen—by far the most nutritious matter. Wheat, he stated, was apt to degenerate, the white upon many soils becoming red, and in some instances the colour of the chaff, notwithstanding, was retained, and thence those varieties called red with white chaff, and white with red chaff, were derived. A large number of new varieties have, during the present century, been introduced, which, after a time, have been superseded by other and better varieties; and he had no hesitation in asserting, that most of the new varieties were far more productive than the old. He cautioned them how they purchased advertised wheats, as nothing was more liable to mislead persons, when the seed was taken to another part of the country, as they found it degenerated. The Whittington wheat, which took a prize at Liverpool, was very liable to this. It had been grown in his own neighbourhood until it was discarded by the millers. It was far more preferable to cultivate wheat grown in their own neighbourhood. He had found wheat to thrive best on strong alluvial soils. If it was a sandy loam, some strong clay might be added—or common clay with chalk or lime. Lime was very useful when too much was not put on at once, or too often; and he could mention cases where tenants used lime until it did mischief, beginning to act injuriously. The proper use of lime was to decompose portions of manure, and fit them for food for plants, so that they might readily take it up. The solidity of the seed-bed in light lands was essentially necessary, and when the seed was put in, the land should be consolidated as much as possible. In Sussex, a heavy presser, formed by the action of a wheel of cast-iron, was used. Heavy rolling was essential wherever it could be effected properly; shallow ploughing was also practised for the wheat crop, especially upon the chalk clay soils, most of the land not being ploughed to a greater depth than three inches; and, as it produced excellent crops in this way, the principle might be considered correct. It is also considered a good plan to plough the land some time previously to putting in the seed, as the small weeds would have in most seasons vegetated before the harrowing-in of the seed took place, and thus be destroyed. On the strong clays of Essex, a species of *agrostis*, known as black grass, came up in profusion upon the well-tilled lands, and injured the crop to a considerable extent; but as it is found impossible to eradicate it, perhaps the better mode would be to scarify or plough the land and drill it over again, and, whenever the weather would allow, he would recommend it as the cheapest and best mode. The land intended for wheat ought not to be too highly manured, but be in a condition well known to them of *being in good heart*, and which could only be obtained by several years' previous good farming. Whenever manure was requisite, it ought to be applied upon the clover either in the preceding autumn or immediately after being mown, and in either cases to the preceding crop, especially those of beans and peas, the former of which, like clover, was considered one of the best preparations for the wheat crop, the deposits from the leaves and roots being highly beneficial to the wheat plants. It was a maxim with some people to say, "apply the means and you will obtain the end;" but he contended that high manuring for wheat caused it to be subject to mildew, and to be lodged before it was ripe, besides forcing the straw, and making the grain deficient in weight. The average produce per acre was set down as from 32 to 40 bushels per acre, but he believed the ordinary produce was more likely to be from 20 to 30. He would not for a moment attempt to throw any impediments in the way of improvements, yet he could not forget that nature had set a limit to her laws. As to the mode of depositing the seed, which should not be done too thickly, he preferred dibbling, if the labour could be had, and the season favourable. Dibbling took from two to four pecks per acre, drilling from six to eight, and broadcast from eight to twelve. The drill was more economical, and could be put in use at almost any time, and at any depth; care should always be taken not to plant the seed

too deep, as it would prove injurious to the crop. The broadcast system was now almost superseded by the drill, as it was found much less seed was necessary than formerly. Garrett and Smyth's drills, at the rate of six pecks per acre, deposit one grain to each inch, lengthwise, at six inches apart from row to row. If one half of this remained, it would be sufficient for the production of a good crop, as it was essential that each plant should have sufficient room to tiller, or branch out. The first effort of the plant was to strike its roots downwards deeply into the soil during the severity of winter. In February it formed a knot of shoots just above the ground, called tillers, which might be separated, and each tiller would form a plant or bear an ear. After the tillers had struck root was the best time to give wheat a top dressing. In applying guano or other stimulants, it was better to give them at different periods, say the first in February and again in June, using not more than 1½ cwt. per acre in February. He had not made these experiments on top dressing himself, but he knew some successful applications had been made with those quantities. Much depended on proper rotation crops to insure a productive return from wheat. It would be madness to sow wheat after barley or rye-grass, as both would exhaust the food necessary for the wheat. Clover was, perhaps, the best crop that could precede wheat, as it left so many roots in the ground. There was much food for the wheat plant left by beans and mangold; he had tried wheat after the latter, with a top-dressing, with success. Mangold and wheat were good rotation crops. Wheat should not be sown when the soil was very dry, and too fine tilth was also objectionable, whilst rye could not be put in too dry a state. Tusser wrote an excellent couplet on this in 1557. Mr. Baker then gave some statistics as to liming, marling, and chalking in Essex, Suffolk, and Norfolk, and clay over the peat in Lincolnshire, showing that in some light lands the addition of 16 to 20 tons per acre was the means of insuring good crops, and the marling lasted 20 to 25 years, so that manuring in some cases immediately after was of little use. Wheat might be manured by spreading on the clover, when the land was intended for wheat, which made it less liable to mildew. In harvesting wheat there was a great division of opinion, as well as to when was the proper time and mode of cutting. It was considered a proper time to cut wheat when it had passed from a "milky state" to a "doughy state." Experiments had been made under three heads—first, when it was green; second, when the straw was changing colour; third, when fully ripe. The results were, in the first case 19¾ bushels per acre, valued at 61s. per quarter; in the second, 23½, at 63s.; in the third, 22¾, at 61s. There was a similar result in the straw. The total value per acre was found to be—On that cut green on 8th August, £12 17s. per acre; second, cut when yellow below the ear one week afterwards, £13 7s.; third, cut when fully ripe, one week later, £11 12s. This difference arose from that cut first and second producing more fine flour and less bran than that cut last, which proves that the gluten is converted into starch, if the wheat stands until fully ripe, the proper time being undoubtedly as soon as either end of the straw has changed to a yellow colour, the sap having then ceased to flow; but, on other hands, it is better to cut early, as no portion is lost by shedding during the process of cutting, or by the effect of high winds; it is also less liable to sprout in the sheaf, and early harvests are also generally best; besides, a few days gained in the commencement of harvest is of immeasurable advantage, and enables the farmer to take opportunities for effecting other work, which otherwise he could not do. In the three modes of cutting—reaping, mowing, and fagging—he preferred the mowing, as being the cheapest and liable to the least waste; and he would advise cutting a little earlier rather than too late, as the straw would be much better for fodder. The weight would be greater, and if they could do so he recommended them to take the medium course, but never to let the harveat be driven off too late. It was a practice in Norfolk of folding on wheat, but he never recommended it being done after February, and thought it ill adapted for their cold clay lands. After they had harvested, they should take the best care of it they could, and as he had said he preferred mowing, he did so because the sheaves were left more open, which was very essential to let in the sun and air. To prevent vermin eating the produce, he recommended the stacks being placed on stands, and was in favour of thrashing by horse-power instead of steam, as the latter bruised the grain and injured the straw. Steam-power was doubtless far cheaper than horse-power, and the flail more expensive than any; but each mode had corresponding disadvantages. By steam-power the straw was rendered useless for marketing and many other purposes; the feeding value was diminished or destroyed; and the grains split and injured. The injury was less by horse power, and there were frequently periods when little else remained for horses to do, and the thrashing might be resumed at intervals without inconvenience, and thus all the feeding properties of the straw be retained. As regarded oats and barley in which clover was abundant, the value of the feeding property when thrashed day by day with the flail is equivalent to the whole cost of the thrashing altogether. But the position of the farm, the contiguity of markets, and the cost of labour, must always govern, and the judgment of the cultivator would guide him to the selection of the best method.

He then proceeded to treat of the diseases to which wheat is subject, and entered at considerable length into their nature, which our limits will not enable us to give. He stated that all plants were more or less liable to become attacked with parasitic fungi, which consisted of a particular fungus growing upon the plant, or of entering the sap vessels during its growth, and protruding from the interior to the external vessels. Of the first was the rust, or *Uredo rubigo*. This usually attacked the blades of wheat when in a highly vigorous state, and frequently proceeded from high manuring, especially with guano or other powerful top-dressings. Sometimes it produced little injury; at other times it was exceedingly injurious, the blade of the wheat changing to a deep rusty red colour, and splitting into shreds. But the most injurious of any was that known as mildew, or *Puccinia graminis*, which bursts through the epidermis of the stem, and breaks up the active cellular tissue of the plant, which becomes rugged and changes to a black colour. Upon examination with a powerful microscope it is found to consist of myriads of club-shaped spores or fungi, which exhaust the sap, and render the grain in many cases valueless. Sudden and rapid changes of temperature are supposed to produce it; and in some seasons it destroya the crops of whole districts. The years 1804 and 1852, in the present century, were remarkable for its prevalence; and it must be remarked that the immediate cause of its appearance is unknown; still it must be observed that it is rather an effect than a cause of disease, for it is generally found that all parasites attack diseased plants in preference to those that are

healthy. The pea is especially liable to mildew; as well as the Swede turnip, cabbage, and, indeed, every description of plant and vegetable. It not only destroys the leaves, but the bulb of the turnip itself. The grape vine has also of late become exceedingly liable; and the disease is now ravaging the continent, and destroying the produce of most of the vineyards. With vines under cover, and even in exposure, flour of sulphur is a certain remedy. It must be dusted upon the leaves and fruit until the mildew disappears, which it does in a short time. There is another description of fungi which attacks the grains of wheat, converting the ovary of the grain into a black fœtid substance (*Uredo caries*), which, on being broken, attaches to the sound grains, and seriously injures the sample. This is prevented becoming injurious by immersing the grain in steeps of sufficient strength to prevent the vegetation of the smut-ball, and not sufficiently strong to injure the vegetative power of the wheat. Blue vitriol and arsenic, as well as strong ley from wood ashes, effects the object, the application of which does not need description.

The wheat-midge is a small insect of a yellow-ochre colour, about the size, and similar in appearance to a small gnat, that, by means of its tail-like ovipositor, inserts its eggs between the glumes of the chaff of the wheat, which soon become small yellow maggots, and feed upon the pollen; and, by gluing the chaff together, it prevents the anthers escaping, and the grain fructifying. It usually makes its attack upon that side of the ear which first emerges from the sheath; and thence, the injury is mostly found on one side of the ear only. Sometimes it injures the crop to an extent of upwards of 20 per cent.; and may be seen best about four o'clock of an evening, when the weather is warm and the air still, from five to ten of them being visible at one time upon a single ear.

The destructive effects of the larvæ of the *Elator tincatus*, or "lined click beetle," known as the wireworm, are sometimes exceedingly destructive, especially upon newly-raised pasture or grass land. It protracts its existence in its larva state for several years together, and destroys the young plants it meets with, by eating through them beneath the surface. A preventive is stated to have been found, by drilling in guano or rape-cake with the seed, but probably with uncertain success. The best preventive was thorough good farming, never suffering grass to accumulate, especially the stems of ryegrass; for it is in decomposing vegetable matter that the beetle deposits its eggs, which become the future larvæ, so destructive in its effects.

Mr. Baker then adverted to the interest the French people were taking to have a full supply of corn for the ensuing year, being fully alive to the necessity of having statistics of agricultural produce, and making a provision when there was a deficiency; and urged on the Club the necessity of taking up this question, with a view of pressing it on our own Government; and stated that, in his opinion, the machinery was complete, through the Boards of Guardians, for obtaining the fullest statistical returns for the kingdom at large. He also adverted to the imperfect mode of taking the averages, and suggested an improvement, by the purchasers of grain having printed receipts for all grain purchased, which should be signed by the grower, and then returned to the officer appointed for that purpose.

Mr. Baker concluded by an eulogium upon the pleasures to be derived by an investigating mind. The book of nature was open to every one; and if man would read it, an inexhaustible source of pleasure and profit might be found; whilst the mind would gradually rise from nature to nature's God, and the works of an Almighty Power would day by day become more apparent, and increase our wonder as they become investigated. Mr. B. concluded his long and eloquent address (of which the above is a mere summary) amidst loud applause.

Mr. WARNER and Mr. T. SPENCER highly complimented the lecturer, the latter inquiring how it was that some of them had ceased to grow wheat after oats, and objected to the land being ploughed so frequently, as it might lie under grass longer, and produce mutton and beef.

Mr. CAMPION did not agree with the last speaker, that it was a good plan to grow wheat after oats, as it was bad in principle to grow two white straws in succession.

Mr. WARNER, of Weston Hill, moved a vote of thanks to Mr. Baker, which was seconded by Mr. Harrison, who made some remarks urging a tenant-right.

Mr. BAKER, in acknowledging the compliment, said it had never been orthodox in his county to grow wheat after oats: there were leases to prevent it. He believed they might obtain more beef and mutton off a farm of a hundred acres, where half of it was ploughed, than where it was all grass-land.

The meeting then broke up.

EAST SUFFOLK AGRICULTURAL ASSOCIATION.

MEETING AT IPSWICH.

The county of Suffolk takes high rank in the annals of modern agriculture. It numbers within its boundaries many who have done essential service to the cause; and who have aided by the exercise of their abilities to improve not merely their own districts, but the common cultivation of the kingdom. Names that stand distinguished at such a meeting as that we have just visited often occupy as prominent a position at others, less limited in their sphere, and far more formidable in the extent of competition. They appear, too, at nearly equal advantage in either of those departments, into which the objects of an agricultural society are now generally divided. You find the Barthropps, Crisps, Catlins, and others, widely known for the excellence of their horses and cattle; while the Garretts and Ransomes have become yet more celebrated for what they have achieved in advancing the business of the farm.

A Suffolk Agricultural Association ought, consequently, to ensure a meeting of some character and importance. It has done as much. In addition to the hearty support of the farmers themselves, the East Suffolk Society appears to enjoy the genial co-operation of the gentlemen of both town and country. Their presence we are inclined to look on, so far as our own experience goes, as no mere matter of form, or

cold sense of duty. They would seem rather fully to feel the mutual advantage of thus bringing landlord and tenant together, and more and more closely identifying interests, that can never be well divided.

The Society has now reached its twenty-second anniversary; being, we believe, almost the only one in the county that has lived through "the troublesome times." Strictly practical in its composition, as well as in the direction of its operations, the feeling of the members, or at least the great majority of them, has commonly and naturally had a leaning towards what is called "the Country Party." The "no politics" rule, however, has had its use here; and while other bodies fell with the fall of its one exclusive object, the East Suffolk still continues to flourish as an *agricultural* society.

There have been, we are assured, few more satisfactory in its results than the gathering which took place at Ipswich on Thursday, Sept. 7. The attendance of visitors was very good; the receipts at the doors reaching double what was taken last year at Framlingham. The character of this attendance, too, was in itself significant. In addition to almost all the best men in the district, you recognized others as well known in adjoining or neighbouring counties. Fisher Hobbs, William Hutley, Robert Baker and others from Essex; the Hudsons of Castleacre, and Overmans from Norfolk; Turner and Rigden from Sussex; with very many more, whom the attractions of the society had drawn from even longer distances. The chief of these inducements, no doubt, was centred in the show of Suffolk horses—well-known to be one of the strongest displays of the kind in the kingdom. The Suffolk, indeed, is at present something of a "fancy" animal in the stock of an English farm. You hear frequently of his reaching such prices as, compared with others, the shorthorn only does with cattle, or the Cochin China fowl amongst poultry. His innate recommendations, however, are many and valuable: for purely agricultural purposes he has, perhaps, no superior, although other breeds may excel him for road or town work. Hardy, active, and powerful, the Suffolk soon grows into use; while his even temper and disposition help him to wear on long and profitably. There are few sorts of horses out of which more fair work may be had.

The show on the present occasion, if strong enough to the eye of a stranger, was said scarcely to reach an average. Of aged stallions there was but a small entry, though with some already famous horses amongst them. The one (Mr. Stearn's) which took the first prize had two or three points far surpassing the common or general character of the breed—a good head and a bright cheerful eye amongst other things in his favour. The three and two-year-olds—the latter more especially—were remarkable for the quickness with which they had come to their growth. The winner of the two-year-old class, Mr. Capon's colt, was really a wonderful animal of his age, with every promise of developing into something yet better. The cream, however, of the Suffolks was thought to be, this season, in the brood mares, foals, and fillies of two and three years old. It will be seen that the strength of Mr. Barthropp's and Mr. Catlin's stock was here; both these gentlemen, in these classes, at any rate, doing every credit to their previous repute. The two and three-year-old fillies, it was said, have been rarely better.

It would be scarcely safe to say as much for the general show of these horses. It is, in fact, a question with some, whether for the last year or two the breed has quite come up to its full quality. The show at Gloucester was, by comparison, commonly admitted to be but a poor one; although one of the members for the county, Sir Edward Gooch, expressed his fears at this Ipswich dinner, as to some of the best and *soundest* horses leaving the county. Another of the speakers, Mr. Fisher Hobbs, called attention to the slovenly and cumbrous manner in which they were too often shod. May not this in some measure account for their bad feet and assumed inability for road work? But this is not all. If there were bad feet, there were quite as certainly bad hocks. We saw two or three horses—prize stallions amongst them—that might pass with such as Suffolks, though we have very great doubts as to their being overlooked in any other breed of English horses.

The Suffolk is essentially a show of horses—farm, coaching, and riding. In the first of these there was nothing, of course, to oppose the native sort. In the riding were two or three very clever thorough-bred horses; and we can only say, it must have been a very good-shaped one to beat old Robin. The judges, however, considered that they found his superior in Mr. Waller's The Lion—a younger and fresher nag certainly, but *hardly* with better points.

Some very promising and well-bred young stock, with a few really famous cobs, completed the show of horses. One of the latter, a chesnut cob, the property of Mr. Gowing, who took the Duke of Hamilton's premium with him, was very near perfection, either for form or action.

With the horses, the Suffolk show is nearly over. The society—we don't know why, is about as weak in other respects as it is strong in this. Of sheep—Southdowns—there were very few entries, and those of no great merit. The gentleman who won here was much in the position of another in one of the cattle classes who—according to the public avowal of Mr. Rigden, on behalf of the judges—could not possibly have taken the prize had there been anything to oppose him! Surely the award of a *premium for excellence*, under such circumstances, is but a farce on either side—either "to him that gives or him that takes it."

A few short-horns, with a greater number of Suffolk beasts, ran out a very unattractive department of the park in which the exhibition was held. The Suffolk cow, said to be a good doer and famous milker, unlike the Suffolk horse, enjoys but small renown out of her own county. The same, to a certain extent, may be said of the Suffolk pig, which on this occasion was opposed by the more fashionable Essex; and Fashion, for once again, if we take her best test—personal appearance—is not here far wrong in the distribution of her favours.

The prize-list of the East Suffolk Society is

confined not only to premiums of the description we have already noticed, but has others for the encouragement of the farm-labourer. It would be impossible for us to dwell on this latter branch of the Society's endeavours; nor would we wish to do so after the manner in which Mr. Allen Ransome gave "Prosperity to the Working-Man," at the dinner that closed the day's proceedings. It was one of those addresses in which the warm feelings of the speaker seem to supply him simultaneously with the best words for expressing them. A wonderful gift, certainly; but one, unhappily, to which the ready hand of the reporter can rarely do justice.

Altogether, we seldom saw a dinner go off better. The President, Lord Stradbroke, proved himself in every way worthy of his office, as of the heartiness with which the meeting received him. The toast-list included amongst the speakers Sir E. S. Gooch and Sir Fitzroy Kelly, the members for East Suffolk, Mr. J. C. Cobbold, the member for Ipswich, Mr. Fisher Hobbs, Mr. Western, Mr. Ransome, and Mr. Fonnereau; to the last-named of whom the members of the Society are indebted for so picturesque a spot to hold their gatherings on. With a continuance of his kindness, they must remember that, whenever they re-visit Ipswich, they have the best Show-yard in England.

As if in anticipation of what is said to be the growing desire of the makers, the East Suffolk Society offers no premiums for Implements. There were, however, a few stands of exhibitors—Ransome's, Garrett's, Turner's, Smyth and Co., Seaman, and Page and Gurling. These, of course, brought as usual their best wares, the lion of all being the new Automaton Reaping Machine—another American invention, which Messrs. Ransome and Garrett have united their forces to perfect. Such a union speaks well for both them and their customers, and the machine itself appears full worthy of their best efforts. The great novelty—and it is a great one in mechanics—is a contrivance, jointed and moving like the human arm, which collects the corn as it is cut, into bundles, and deposits it at regular intervals ready for the hand of the binder. One of the machines was at work near the town during the morning, and although hardly yet correct in one or two minor details, it promises eventually to prove a still further advancement in the use of this important implement.

JUDGES.—AGRICULTURAL HORSES: Mr. Philips Powell, Southland, Uxbridge; Mr. G. F. Parsons, Waldringfield; Mr. Robert Baker, Writtle. RIDING HORSES: Mr. Edward Green, Bury St. Edmunds; Mr. George Appleton, India House, London; Mr. Richard Tattersall, Newmarket. CATTLE, SHEEP, AND SWINE: Mr. William Rigden, Hove, Brighton; Mr. James Turner, Clinton Seaton, Sussex; Mr. William Dodds, Nacton.

AGRICULTURAL HORSES.

	£	s.
1. Best stallion, Mr. Wm. Stearn, Elmsett	10	0
2. Second best ditto, Mr. W. Wilson, Ashbocking	5	0
3. Best three-year-old entire colt, Mr. T. Crisp, Chillesford	5	0
4. Second best ditto, Mr. John Williams, Trimley	3	0
5. Best two-year-old entire colt, Mr. T. Capon, Denington	4	0
6. Second best ditto, Mr. T. Catlin, Butley	2	0
7. Best one-year-old entire colt (Mr. Garrett's premium) Mr. W. Wilson	£3	0
8. Second best ditto (Mr. Garrett's premium) Mr. William Laws, Framlingham	2	0
9. Best gelding, Mr. S. Wolton, Newbourn	3	0
10. Best mare with foal at foot, Mr. N. G. Barthropp, Cretingham	5	0
11. Second best ditto, Mr. N. G. Barthropp	3	0
12. Best Foal, Mr. N. G. Barthropp	5	0
13. Second best ditto, Mr. Thomas Catlin	3	0
13A. Best foal by Mr. Wilson's Goliah, Mr. Moses Crisp, Letheringham	3	0
13B. Second best ditto ditto, Mr. William Laws	1	0
14. Best gast mare, Mr. Thomas Capon	5	0
15. Second best ditto, Mr. John Cockerill, Wantisden	3	0
16. Best three-year-old filly, Mr. N. G. Barthropp	5	0
17. Second best ditto, Mr. Thomas Catlin	3	0
18. Best two-year-old filly, Mr. N. G. Barthropp	4	0
19. Second best ditto, Mr. Charles Frost, Wherstead	2	0
20. Best one-year-old filly (Sir Edward S. Gooch's, Bart., M.P., premium), Mr. Thomas Catlin	5	0
21. Second best ditto ditto, Mr. Thomas Catlin	2	0

RIDING HORSES.

22. The Most Noble his Grace the Duke of Hamilton and Brandon: Premium for the best entire cob (to approach the nearest to the old Suffolk Punch for the road), not to be under 13½ hands, and not to exceed 15 hands, to be the property of a member of the association, and to have served mares in the eastern division of the county in 1853, Mr. George Gowing, Trowse, Norwich	5	0
23. The best entire riding horse, to be the property of a member of the association, and to have served mares in the eastern division of the county in 1853. Mr. M. Keer's premium, Mr. Thomas Waller, Sutton	5	0
24. The Most Noble his Grace the Duke of Hamilton and Brandon: Premium for the best cob mare (to approach the nearest to the Suffolk Punch for the road), not to be under 13½ hands, and not to exceed 15 hands, and to be the property of a member of the association, Mr. Caleb Kersey, Framlingham	5	0
25. Best foal for riding purposes, Mr. G. Sexton, Wherstead	5	0
26. Best foal for coaching purposes, Mr. Geo. Brooke, Capel	5	0
27. Best foal by Sotterley (Mr. Barlow's premium), Mr. George Sexton	3	0
28. Best three-year-old riding gelding or filly, Mr. Alfred Packard, Woolverstone	5	0
29. Best three-year-old coaching gelding or filly, Mr. Nath. Welton	5	0
30. Best two-year-old riding colt or filly, (the Right Hon. Lord Henniker's premium), Mr. F. Barlow, Hacheston	5	0
30A. Best hackney mare or gelding of any age, to be the property of a member (William F. Hobbs', Esq., premium), Mr. Thomas Crisp	5	0
30B. Second best hackney mare or gelding, Mr. J. A. Ransome	3	0

CATTLE, SHEEP, AND SWINE.

31. Best Suffolk bull, Mr. N. G. Barthropp	5	0
32. Second best ditto, Mr. G. D. Badham	3	0
33. Best Suffolk bull calf, under 12 months old, Mr. G. D. Badham	2	0
34. Best bull of any other breed, Mr. Thomas Crisp	5	0
35. Second best ditto, Sir E. S. Gooch, Bart., M.P.	3	0
36. Best bull calf of any other breed, under 12 months old, Mr. C. Jeaffreson, Melton	2	0
37. Best Suffolk cow, Mr. N. G. Barthropp	5	0
38. Second best ditto, Mr. M. Biddell, Playford	3	0
39. Best three-year-old Suffolk heifer, Mr. N. G. Barthropp	4	0
40. Second best ditto, Mr. G. D. Badham	2	0
41. Best two-year-old Suffolk heifer, Mr. A. W. Crisp.	4	0
42. Second best ditto, Mr. N. G. Barthropp	2	0

43. Best one year old Suffolk heifer, Mr. G. D. Badham £2 0
44. Best cow of any other breed, Mr. N. G. Barthropp 5 0
45. Second best ditto, Mr. Thomas Crisp 3 0
46. Best three-year-old heifer of any other breed, Major Parker, Clopton Hall, Rattlesden 4 0
47. Second best ditto, Mr. N. G. Barthropp 2 0
48. Best two-year-old heifer of any other breed, Rev. R. Moore, Worlingworth 4 0
49. Second best ditto, Mr. N. G. Barthropp 2 0
50. Best one year old heifer of any other breed, Sir E. S. Gooch, Bart. 2 0
51. Best pure Southdown tup of any age, Mr. G. Sexton 5 0
52. Best pure Southdown shearling tup, Mr. G. Sexton 5 0
53. Second best ditto, Mr. G. Sexton 2 0
54. Best pure tup of any other breed, of any age, Mr. M. Crisp 5 0
55. Best pure shearling tup, ditto, Mr. M. Crisp 5 0
56. Best pen of 5 shearling pure Southdown ewes, Mr. Geo. Sexton 5 0
57. Best pen of 5 shearling ewes of any other pure breed, no entry £5 0
58. Best pen of 5 shearling ewes not pure breed, no entry 3 0
59. Best boar, Mr. G. D. Badham 3 0
60. Best sow and pigs, the pigs not to exceed 12 weeks old, Mr. James Luff 3 0
61. Best breeding sow—the premium not to be paid until after the sow has pigged, Mr. M. Biddell. 2 0
62. Best pen of 3 young sows, not to exceed 8 months old, Mr. S. Wolton 2 0
63. Best fat ox or heifer, bred by a member, J. Moseley, Esq. 4 0
64. Best pen of 3 fat shearling wethers, premium given from a friend to the association, Mr. Richard Garrett. 2 0

Sir Fitzroy Kelly's premium of £10 for the best essay on the "Improvement of Poor Light Soil and Poor Thin-skinned Soil in the County of Suffolk," to Mr. Cornelius Welton, of Wickham-market.

THE DUKE OF RICHMOND'S CATTLE SHOW.

This cattle show was held on Thursday, Sept. 7, on the grounds around the old castle of Strathbogie, at Huntly. The competitors are confined to the tenantry on the Gordon estates, and are solely maintained by the enlightened liberality of his Grace, who, besides meeting all other expenses, yearly distributes in premiums upwards of £100. The day was very wet, which showed the stock under a disadvantage, and interfered with the attendance. There was, notwithstanding, a large number of the tenantry and of the leading agriculturists of the district. The Duke of Richmond was early on the ground, and, in spite of the heavy rain, remained till nearly two in the afternoon. The Earl of March was on the field during the entire day. Her Grace the Duchess of Richmond was also on the ground during a part of the forenoon, as was also the Duchess of Gordon and a party from Huntly Lodge. Among those on the field were—Sir J. H; Dalrymple Elphinstone, Bart.; Mr. Simpson, of Cobairdy. Mr. Lumsden, of Auchindoir; Mr. Grant, of Beldorney, and Mrs. Grant; Captain Grant, of Glenbarry; Mr. Geddes, Orbliston, &c. There was a large amount of stock shown, there being not fewer than 251 entries of live stock. In general, the quality of the animals shown was very superior, though in some cases there were traces of the severe ordeal to which cattle in this district have been subjected from the burnt-up pastures of the past summer. The shorthorn breed of cattle made a good appearance. In the class of bulls eight animals were entered, all of which exhibited considerable excellence. The first prize bull, from Orbliston, was unquestionably a very superior animal, presenting particularly fine quarters, while he was low in front, almost indeed to a fault; he also handled freely. The bull to which the second prize was awarded was, as respects merit, placed below other two animals shown respectively from Dipple and Broadland; these latter, having both carried off second prizes at former shows, could not again receive a similar money prize. Mr. Cantlie's bull was only 37 months old.

There was also a large display of cows of the same breed. The first prize animal from Broadland was a perfect beauty—showing great elegance of frame, with a well-shaped and well-set head, and at the same time not exhibiting an over-preponderance of fat. We may remark that this animal was, at the show of the Strathbogie Farmers' Club, held the preceding week, placed below the cow (one from Smithstown) to which the second prize was awarded on Thursday. Broadland's beast was decidedly the favourite on Thursday. The queys, both one-year old and two-year old, comprised many animals of high promise.

The Aberdeenshire polled breed were, as usual, a large show. It was apparent, even to the casual observer, that many of the animals shown in this class contained much cross blood, exhibiting points which, however much they might have been prized in shorthorns or in crosses, could not be regarded as other than blemishes in black cattle. We were glad to notice that the judges, in giving their awards, appeared to have been guided chiefly by a regard to the purity of the breed, and gave prizes, not to the largest animals, nor even to what to the uninitiated might have seemed the most showy, but to those beasts exhibiting the highest breeding and the greatest purity of blood. Even in the class of oxen we noticed that the prize was awarded to the smallest pair shown, both of which were very neat animals. Some of the cows and queys were good; few of the bulls exhibited much excellence.

The display of Highland cattle was of such a kind as we apprehend could not be excelled from any other estate in the country. The first-prize bull, from Minmore—a young creature, not five months old—was a perfect gem, presenting all the excellencies for which this useful and hardy breed of cattle is distinguished. The cows and queys from Minmore were also superior; it will be seen that four of them carried off prizes. Mr. Smith, Nevie, showed a very fine pair of Highland oxen, which, however, failed to get a prize. One of the two prize oxen from Coynachie was reckoned an animal of rare beauty, being peculiarly low upon the legs, and deep in the brisket. As a whole, the Highland breed, though confined to a few exhibitors, were in as great perfection as any other class of cattle on the ground.

Among the cross-bred oxen there were some very heavy animals. In the three-year-olds, the second prize was given to the heavier of the two pairs of animals; the first pair, however, were the fatter of the two, and also handled better. It was stated that the second prize pair could not weigh less than 24 cwt. They were sold, we believe, for £37. Among the

year-old prize oxen was one animal of great promise; it was apparently out of a Highland cow.

The sheep, as usual at this competition, were a fine show. In the Leicester breed the honours were wholly shared between Dipple and Orbliston. The latter were perhaps the finer sheep; the former had certainly the finer wool. In the Cheviot breed the Duchess of Gordon was almost the only exhibitor, and she at least carried off all the prizes. The specimens she showed of this hardy and useful sheep were all well bred, and apparently of great purity. Almost similar remarks may be made respecting the blackfaced breed, in which the prizes were exclusively awarded to Messrs. Smith, Coynachie. We must say, indeed, that we never saw finer tups of this breed than were exhibited by the Messrs. Smith; their ewes were also particularly good, and their wedders were strong valuable sheep. The crosses embraced some valuable sheep; and here again the contest was chiefly between Dipple and Orbliston. Both stocks were good; and the honours are pretty equally shared. We may notice, as something rather curious, that a pen of five *yearling* wedders, belonging to Mr. Hunter, having by mistake been entered among the *two*-year-olds, they actually carried off the prize in that class from sheep twelve months older than themselves! We need not say that they were of rare excellence. A sufficient proof of this will be found when we mention that, in the course of the forenoon, Mr. Hunter sold the pen for £20; being at the rate of £4 a-head for yearlings! A pretty good price this, it must be admitted.

There were few implements exhibited. The chief was a "sheep-dipping machine" shown by the Duchess of Gordon. This machine, which is designed to be used in the application of Wilson's composition, presents a sloping flooring of a triangular shape, surrounded by a railing, and divided also into two compartments by another railing running up the centre. At the lower end is a trough to contain the liquid. The sheep to be dipped are introduced into one of the compartments, and after being dipped are passed into the other; where, as they stand for some time, the liquid which drops from their fleece falling upon the floor runs down towards the trough. There is, therefore, by this principle, no waste of the composition. The judges, in their report, "very highly commended" the machine; adding, that "the judges think that thanks are due to her Grace for having shown it." Besides this machine, there was also a "urine cart," shown by Mr. Wagstaff; an implement with which much of the "manurial rain" plan of Mr. Mechi may be accomplished. Mr. Conolly also showed one of the patent churns, so celebrated for the quick conversion of cream into butter.

As usual, his grace exhibited some stock from the Home Farm of Gordon Castle. These comprised some very fine Leicester and Southdown tups, shearlings, and ewes, together with shorthorned queys and Highland stots. As the judges remarked, some of the stock were lean, having suffered from the scarcity of the grass this summer. It required no peculiar penetration, however, to discover in all the animals shown marks of high breeding, and the leading elements of good stock. The Highland stots, which seemed to have borne beat the exigencies of the past season, were all of them splendid animals. One pair was, we believe, sold on the ground for fifty guineas!

The judges were Mr. Simpson, of Cobairdy; Mr. R. Wilson, Durn; and Mr. Longmore, Rettie.

THE POTATO DISEASE.

SIR,—During the course of the last few months that dreadful scourge, the potato-blight, has again made its appearance amongst us, and has already committed great devastation in this and the sister island. My avocations having lately afforded me a few weeks' leisure, I determined to devote it to the re-investigation of the subject, in the hope of ascertaining, if possible, the cause or origin of the disease, as well as a means of curing it or preventing its occurrence. I will not now occupy your time and space with a long account of all the experiments and researches that I have made with this object, but will content myself with making you acquainted with the general conclusions at which I have arrived. They are as follows:—

1st. That the potato-blight is neither directly nor indirectly caused by the ravages of any parasitical insect.

2nd. That it is the effect of a species of putrefactive fermentation or incipient decomposition of the nitrogenous (*i.e.* albuminoid) constituents of the sap or cell-contents.

3rd. That this decomposition is either directly produced by a peculiar fungus, the *botrytis infestans*—to which public attention has been already directed by other writers—or, what is, in my opinion, a still more probable supposition, the fungus referred to only makes its appearance after the fermentative processes have been in action for some time, and, consequently, is *an effect* and not *the cause* of the disease.

4th. That the blight has been in some measure produced by the long-continued and indiscriminate use of animal nitrogenous manure, which has over-stimulated the potato plant, and thus rendered it more susceptible of disease, and has, in fact, produced the same effect upon it that alcoholic drinks, when taken in excess, do on the human system; that is to say, it has injured the stamina of the plant, and rendered the organism more readily affected by atmospheric and other influences.

5th. That animal or highly nitrogenous organic manures should be used with great caution in the cultivation of the potato, and indeed, in that of all root crops; the best manure for the potato plant being the inorganic composts, such, for instance, as those which are, or were at one time, used in some parts of the continent.

6th. That the disease having once established itself, has become epidemic.

7th. That it is contagious, if not infectious.

8th. That the only mode of eradicating it is to restore the original constitution of the plant.

9th. That this desirable result can be only brought about by introducing a complete alteration in the mode of cultivation that is adopted.

10th. That the changes in question should consist: 1st, In thoroughly drying the seed potatoes, by the process now followed in some parts of Germany; 2ndly, in steeping them for a short time in a dilute solution of the sulphate of copper (blue vitriol or blue stone), of about the same strength as that

used for "pickling" wheat; 3rdly, in planting them in poor, well drained land; 4thly and lastly, in substituting for the farm-yard manure, &c., now employed, some *inorganic* compost similar to those before alluded to.

In conclusion, I would suggest that the following simple experiment should be tried in storing the potato crop during the present season:—Let the tubers be stored in the usual way, but in the centre of each heap or sackful let there be placed a quantity of *unslacked* lime, not in actual contact with the roots, but enclosed in some porous vessel—an old wicker basket for instance—and covered over with and surrounded by a thick layer of straw or hay. By this means the tubers will be kept *dry*, and, as the presence of humidity in the air is a great incentive to putrefactive decomposition, one of the main causes of decay will be removed. The lime, so soon as it has become slacked, may be taken away and employed as manure, and, if practicable, should be replaced with fresh lime. The experiment I have described, it must be remembered, can be easily tried, and would cost but little, even if carried out on a large scale; it cannot be productive of any injurious consequences, and will be doubtless attended with beneficial results.

I remain, sir, your obedient servant,

THORNTON J. HERAPATH.

Mansion-house, Old Park, Bristol, August 17th, 1853.

WAGES.

THE EQUITABLE WAGE PRINCIPLE.

No. IX.

I have committed the political evil of raising my voice against a law that has been recognized by the rulers of the land, and which is exercised by the capitalist more or less. I have said that "until the injustice of the principle is exposed, there is no hope for the labouring man; for a necessary corollary (and certainly a most convenient one to all employers) of the law of supply and demand is the dogma of free labour, which asserts that in any way to restrict the liberty of the capitalist to buy his labour in the cheapest market, and sell it (of course) in the dearest, is to interfere with the rights of commerce, and ordinary trade ideas." But this, and solely for the capitalist, would seem to perpetrate an even greater evil than the present wage law; for it would cut both producer and consumer, and give rise at the same time to underpaid workmen and overcharged purchasers, to cheap labour and dear commodities, for the mere aggrandizement of the middle man. I will give a quotation bearing upon this point.

"To buy labour at the cheapest possible rate, without any regard to the value of the produce, is to defraud the producer; and to sell it at the dearest possible rate, without regard to the prime cost of the commodity, is to wrong the purchaser. Surely this was the principle of trade which guided the dealings of Ikey Solomons, the Jew fence; and yet he was tried at the Old Bailey, and transported, for putting it in practice. In the case of the receiver of stolen goods, the main iniquity consists in not paying a fair price for the labour represented by the article purchased; and indeed it is often this buying of articles far below their equitable value that constitutes the chief evidence as to the guilty knowledge of the receiver."

If no restrictions are to be put upon the capitalist, and, despite the principle of justice, they are to buy their labour in the cheapest market, and sell it in the dearest—or, in other words, make the necessities of their fellow-men their stock-in-trade—why then, in the name of common justice, shall they not stand with the Jew referred to, and answer to the same charge against them? for the charge is identical in both instances—that of not paying a proper price for the labour of the commodities they obtain.

Who wonders to see labourers forming themselves into Co-operative Societies, and ready ever to listen to those who obtain wide popularity by goading on the irritated feelings of their audience, by taunting them with their degradation? Who wonders to see the panaceas that are ever and anon arising to overthrow the dire effects of this rotten system: I mean the wild Socialist and Communistic theories, that are floating about amongst us—now advancing, now retreating? And so long as the doctrine of free labour, as we see it understood and practised, maintains its usurped position, and makes the remuneration of workmen depend on the greed of the commercial man, rather than on principles of justice, we need expect no settled and happy state of feeling to subsist between the two classes we have shown to be at daggers drawing.

I have used the word restriction with respect to the capitalist. I have said, if he is not *restricted*, and it is probable that I may be asked what I mean by this. All wage regulation bills I consider to be abortive attempts, and furthermore unnatural attempts, to secure that administration of justice, that should be spontaneous. Such regulations would leave the matter of *feeling* just where it was; or more likely, it would intensify it, because the capitalist would kick against the embargo, and hate the cause of it; while in the breast of the workman would be engendered no respect and gratitude to the hand that supplied his wants, but a varying form of a simply malicious triumph.

The restrictions to which I look are those natural ones, arising from a more extended diffusion of the great first principles of justice and morality, in all their various applications to trade, and likewise to the practical use that shall be made of the fact that the master's interest is bound up in the well being and happiness of his workpeople.

The admirable working of these principles, and the truth of this glorious fact is not in any way hypothetical.

The only true and equitable system of wages is the Tribute system; or that which makes the remuneration of the workman depend on the value of the produce of

his labour, and which is opposed to the *hireling* system, which pays no regard to the produce or just property of the labourer, and the *villeinage* system, which regards neither his property nor his liberty. As a tributer, the workman is neither the *slave* nor the *servant* of the capitalist, but is his *partner*, having common interest with him, and "being as anxious to promote his employer's welfare as he is his own."

The "equitable wage principle" here advocated, in contradistinction to that of the "law of supply and demand," is not entirely unknown in commerce. Mr. Babbage, in his Economy of Manufactures—mark it, good readers, in his *Economy* of Manufactures—tells us that the mode of working the mines in Cornwall, by what is called "tribute," or payment for raising and dressing the ore by means of a certain part of its value when rendered merchantable, is found to produce such admirable effects, that he advocates the principle with warmth, merely resting his argument on its economy, independently of all considerations of justice. Mr. Mayhew notices the payment of the crew in whaling ships; the profits arising from fishing with nets on the South Coast of England; the "fourth penny" among the Irish weavers, as being all "instances of the equitable mode of payment or tribute rendered to working men." And Mr. Babbage instances the establishment of M. Leclaire, the French house-painter, which is conducted on this plan, "and which is perhaps the most just and practical illustration of the principle that is at present in existence: the capitalist being paid a fair interest for the use of his money, a return for his risk, and a salary for his superintendence, while the workmen (who receive a certain weekly wage) are allowed to participate with himself in the profits." In his usually clear manner Mr. Babbage sums up the advantages of the introduction of this tribute system into factories, &c., in the following terms: (1). Every person engaged in the business would have a direct interest in its prosperity. (2). Every person would have an immediate interest in preventing waste or mismanagement. (3). The talents of all would be directed to the improvement of every part. (4). None but workmen of high character and qualifications would be admitted into such establishments. (5). When any circumstance produced a glut in the market, more skill would be directed in diminishing the cost of production. (6). All real or imaginary causes for combination of workmen against their employers would be totally removed.

Such advantages are certain to follow to workpeople on farms as well as in factories, to farmers as well as manufacturers, from the thorough adoption of this system; and I advocate it with courage, and the more so, since I am confirmed by such high authority, being confident that until it comes into operation, poverty, discontent, and class enmity will continue to exist, as they have hitherto prevailed among us.

No. X.

The sooner the generally understood principle in modern English trade, that a man's wages for the actual time of his services are full return for them, is abandoned, and the tribute system introduced, the better.

Before a good state can be brought about amongst the poor of our land, masters must be convinced practically that humanity, like honesty, is the best policy. They must be convinced that true benevolence, founded upon Christian principles, is not only consistent with trade principles, but absolutely requisite for carrying them out. This is the sentiment I am anxious to enforce, and to enforce which I would that I were gifted with special persuasive power. Legislation will do nothing in this case, save harm—the change must have a deeper root, and must be founded in conviction. Neither is it a change that we can expect to see effected speedily, for the public opinion that has to produce it needs to be educated for that purpose. Men must come to apply their religion to trade, and not unnaturally separate the one from the other, saying, I will be unjust and an extortioner six days, but on the seventh will I rest from my labours, and do no ill; for here certainly the devil has the best of it, since he is at large during the entire six days, and is only chained up on the seventh—a rather ineffectual and farcical chaining, this latter, I am inclined to think.

No: legislation will not effect this change, any more than in France it could graft a young republic by a parchment edict upon the rotten stump of a despotic monarchy. The French, accustomed to trace their evils to their institutions, taught alike by their writers and their orators to cast upon empty forms the burden of their ingrained sins—they conceived that a change of institutions and of forms would work those miracles which are the slow but certain product of private virtue and individual exertion—of patient toil and more patient endurance—of mutual respect and mutual love. They imagined they could reform society without first reforming themselves. They sought the reward without the effort—the victory without the conflict. They sought in the barren and narrow range of the mechanical, what can only be found in the rich resources of the moral world. They worked for the salvation of the individual without requiring his participation in the task. By destroying external barriers, and striking off material chains, they imagined that man might be rendered free and equal, perceiving not that freedom and equality have their sole roots and guarantees within the *man*. In attempting to legislate for such matters, we should but imitate this fatal blunder. The profound aphorism of Sir James Mackintosh, "Constitutions *cannot be made*, they must *grow*," is of use to us; for we may ever discern the impossibility of *forcing* virtue, of *forcing* justice upon man: both must have their birth within man—they must

grow with his growth, they must strengthen with his strength, else can they never yield other fruit than the famed apples of Sodom.

I have said more upon this point than I otherwise should have done, because there have been recent attempts to gain the consent of our legislators to bills of the character I mention. Mr. Cardwell very justly remarked, at the close of his speech in the House of Commons on the 5th of May, "That what had been said in the course of this debate sufficiently showed how unfit that house was to legislate in such a way, by such bills, on the details of complicated trade."

It rests with each one of us to the extent of his ability to remedy the evil we must deplore. To me the adoption of the tribute system appears the best method of doing so.

The instances and authority I have produced in favour of the tribute or equitable-wage principle will preserve me from being charged with theorism. I have shown that the system has worked, and is working; and I can yet bring further evidence to prove that it meets the unqualified approval of large numbers of men occupying conspicuous places in trade and commerce.

I should, indeed, glory in the fact of being able to bring before my readers any instances of its having been adopted by farmers. In some modified sense it may have been practised, I am quite ready to think; and it will give me pleasure to notice it when I have become personally acquainted with its operations.

There lived and died at Bristol, within the last half century, a merchant of most Quixotic notions and eccentric habits. He thought fit to set at defiance "ordinary trade ideas," and practically reversed the commercial maxim—Every man for himself. Oddly enough, he determined to draw a distinct line between duty and interest. He pursued this strange course so far as actually to treat his men as independent and intelligent co-operators in the work of life; and where he did not find them so, he left no means untried that might make them so. He traded not with their *necessities*, but liberally supplied the wants of the indigent. He educated their children, threw around their homes all the beauties and attractions of social life, and by shortening the period of labour, sent them home early to enjoy and improve their evenings with their families. There is an anecdote that shows the consistency with which he carried out his peculiar course, and it represents him every Friday evening stationed at a certain door by which the labourers made their exit, with a basket in his hand, filled with minute packages in paper. As the men passed, a package was slipped into the hand of each, and one would find that he had a present of five shillings, another of three, another of half-a-crown, and so on, each discerning in his gift an estimate of his diligence. Men who mentioned to him improvements that had occurred to them for any part of the business, he would thank and reward handsomely. And then, at stock-taking, he invariably made gifts. "Every sign of industry and of sincere interest in the establishment gave him satisfaction. When the year wound up well, the pleasure was not all with the principal; for those whose diligence and talent had a share in gaining the result, found also that they had a share in the reward. Stock taking became to them a matter of personal interest, and they would often enquire, 'Hope you find things satisfactory, Sir?' Surely it must be far more cheerful for a master to feel that those around him have some pleasure in his success, than to know that it is indifferent to them, because they are aware that however large the cake may be, he will eat it all alone." His men all testify to the truth of these statements. One, with a fine glow of good feeling, said, when questioned, "He never had a good year but I was the better for it, when stock taking came." Another, a young man with whom he had taken great pains, said, "At stock taking he has sometimes given me a hundred pounds at a time." The same young man told also of the strange conduct of his master when calling on him one evening—"Seeing the three children, he said he would like to make them a present, and when he went home gave him a ten pound note for each of them." Curious, good reader; was it not? Little Miss Flirt might probably press her finger on her lips, and whisper softly, as Mr. Budgett passed, "Rather, m—; rather, m—."

"Well, but of course," you say, "this man died insolvent." Remark the sequel.

From a very humble rank he rose rapidly to become one of the most affluent and respected citizens of Bristol—in fact one of the order of *merchant princes*. The tears of those whose interests he had so carefully considered fell thickly upon the receptacle of his mortal remains, testifying to all beholders that in him, the departed, his people had lost a friend indeed. "Rarely," says the *Bristol Times* of that week, "has a neighbourhood suffered a greater loss in the death of a man." Upwards of 200 men broken down in heart on account of the death of their master! There is a lesson to be learnt in this fact. Such a monument as this above a man's grave, it has been well remarked, costs a price, *and it must be paid for in a man's own lifetime, and by his own hand.*

In business this man was keen—deliberately, consistently, methodically keen. He could buy as scarcely any other man could buy; and sell as scarcely any other man could sell. "He was an Athletes on the arena of trade"—conquered he would not be. And yet, with all this sagacity, and tact, and knowledge of mankind, we find him lending

himself to promote such extraordinary practices as those I have mentioned. Yes, we behold a great man actuated by a high sense of duty, and justice, and worldly wisdom; he throws away the advantages that accrue to the man who acts upon the spirit of our received commercial maxims—who makes self his duty; and in their place maintains that "humanity, like honesty, is the best policy," and "liberality is the truest economy."

No. XI.

OTHER FORMS OF THE TRIBUTE SYSTEM.

We have seen that the system has been approved and practised—nay, originated by men of great worldly wisdom and high standing in the trading, commercial, and manufacturing communities. We have seen that its unvarying results have been *wealth*—pecuniary profit beyond the most sanguine expectations. I am well aware that this is very low ground to take, and that the proper position to have chosen and maintained would have been the plain Christian duty of taking care of our work-people, following the bent of our principles wheresoever they might lead us, without reference to their trade results.

But it is possible that I am addressing many persons who consider that trade and Christianity may be considered as two very distinct pursuits, the one to be followed by all traders; and the other, by such traders as have the same eccentric and quixotic turn we noticed in Mr. Budget, or, in other words, by those who have a fancy for it. There are those who understand the maxim, that "Property has its duties as well as its rights" in this manner: if they succeed to property, *their duty is to increase it* by all the means in their power. The *duty* they see only as it refers to the aggrandisement of *self*. Philanthropic measures and small dividends don't agree with such folks; but humanizing efforts and heavy dividends are very laudable. The invariable question that comes from this class is, "But will it pay?"

There are evidently, considering the two classes of people with whom we have to do, two lines of argument to be pursued—a higher and a lower. There is the moral and Christian argument, and there is the worldly and money-making argument. Even if I proved my position firm in the higher, there would still be the tenable nature of the lower to maintain; whereas if I at once make my position firm on the lower, I preclude the possibility of contention respecting the higher.

There has been a great deal already cited to this effect. It may be well to bring one more instance of the manner in which the truth of the maxim, *Liberality* (not indiscriminate liberality) *is the truest economy*, is adopted by the eccentric class to whom I have repeatedly referred.

I do so the more readily, because it is an important example; and furthermore, because it embodies the experience, and is the result of the deliberate consideration of no less than four hundred practical men of business.

Very many of my readers are acquainted with the fact that there is a candle company, called "Price's Patent Candle Company," in London. This company has its principal works at Vauxhall, where it employs some eight hundred people. The managing directors of this company are two gentlemen, brothers, of the name of Wilson, men upon whose labours it is a joy to look. The history of what has taken place at Belmont factory is very long; but I will endeavour to compress the facts as much as possible. One of the brothers gave his own account of the origin of the educational projects; and I cannot do better than give his words. "The school began in a very humble way by half-a-dozen of our boys hiding themselves behind a bench two or three times a-week, after they had done their day's work and had their tea, to practise writing on scraps of paper with worn-out pens begged from the counting-house. The foreman of their department encouraged them. As they persevered, and were joined by other of the boys, he begged that some rough moveable desks might be made for them. When they had obtained these, they used to clear away the candle-boxes at night, and set up the desks, and thus work more comfortably than before, although still at great disadvantage as compared with working in any ordinary school-room. My brother encouraged them with some books as prizes. The fact of the whole thing being the work of the boys themselves seemed to form so large a part of its value, that we carefully abstained from interfering in it further than by these presents of books for prizes, and of copy books, spelling books, and testaments, and by my being (but not until long after the commencement, and after being much pressed and being assured that it would cause no restraint) always present at the school-meetings to give them the sanction of authority, but taking no more active part than hearing the most backward boys their spelling." Mr. J. P. Wilson then erected a school-room at the expense of £172, and this was completed and occupied in the winter of 1848. Everything for a time was conducted by themselves, till the principle of self-government on which it started was superseded, at the request of the boys, and authority introduced. The exercise of this authority was guided, however, by the general vote, as, for instance, in all cases of fixing the days and hours for schooling. The demand for child-labour in this manufactory is very spasmodic. During a slack time the children not employed are drafted into the school when upon the premises, and remain there well employed, instead of playing about in the streets, till the next flush of work requires their little hands. The evening school throve well.

During eight months in the year the elder boys used to give three nights a-week to it, and one hour and a-half each night. When it is remembered that the 1½ hours of schooling was always after a hard day's work, it cannot be wondered that the boys did not all offer themselves; and by the simple expedient of joining to it some harmless pleasure, eventually all were induced to attend the school. One of these pleasures was the introduction of the game of cricket. The lower part of Lambeth and Battersea Fields, where the chief part of the factory people live, was fearfully swept by the cholera in 1849. It was decided that fresh air and exercise were the best preventives. The Messrs. Wilson obtained the loan of a field, and organized three or four cricket clubs amongst their men and boys. The effect was admirable, for out of the youths employed only one died. So well did it answer, that these gentlemen considered it worth while to hire a piece of ground subsequently, and to incur the expense of £249 for three years. The annual expense is now £80. Mr. Wilson says of it, "I feel that the amount of money, though so large, has been exceedingly well laid out. It induces a quickness of hand and eye, a strength and activity of body," which is of the utmost value in the works, and, besides this, "there may be observed amongst our first-class boys in one of their matches an entire freedom from rudeness of conduct or language; in fact, a really gentlemanlike behaviour towards each other, which makes us feel that the moral training quite keeps pace with the physical." He goes on to say, "I think the mixing of the boys and myself with the men in the cricket and gardening produced much good feeling among us all, and has made many work together in the factory during the winter as friends, who felt almost as strangers before.**** Once get well thrown in with them with a conviction on their part that you are thoroughly in earnest in wishing their good, and the better educated and more formed mind is quite certain to get very great influence for good over the less educated and less formed one, and this influence once obtained goes on working almost unconsciously to the person exercising it, except in its effects."

I cannot do better, in order to show the spirit in which the business arrangements of this company, as far as regards the welfare of its work-people are carried out, than by again quoting from Mr. Wilson's report which lies before me.

"I cannot leave the gardens and the cricket without noticing that they have been the means of softening to the boys one of the greatest evils now existing in the factory—the night-work, for which the men and boys come in at six in the evening and leave at six in the morning. In the course of years we hope entirely to do away with this. To do so now, would require so heavy an outlay as to render it impossible. The boys who are on night-work do not go to bed directly their work is over, being unable generally to sleep if they do so. They used to dawdle about or to take a walk, or in some other way get rid of the time till later in the day, when they went to bed just time enough to get as much sleep as they needed before getting up for work again. The same boys are not always at night-work, but there are two gangs working a week at a time. Now all last summer, the night gang of boys, on leaving work at six o'clock in the morning went straight to our field, and there they thoroughly enjoyed themselves in gardening and cricket until about a quarter-past eight: they then collected in a shed which we have on the ground, to hear a verse or two of the New Testament read to them, and to say the Lord's Prayer before going home to sleep: and the way in which they joined in this little religious service, coming as it did just as a part of their enjoyment, would make one hope for very happy effects from it. I think had the factory and its profits belonged to me, and had the cricket and garden cost double what I have stated, I should have thought it but a sort of conscience money, well spent in thus strengthening the physical and moral health of these boys, obliged by the necessities of the work to keep such unnatural hours. Four mornings a week were thus occupied, whilst on the other two they attended our school from six till eight."

Then there is the summer excursion. The first that took place was to Guildford. One hundred of these boys started at six o'clock and returned at nine at night, breakfast, dinner, and tea being provided for them to eat on the grass. They played a cricket match here, "and, from the way in which they looked at and spoke of the country to each other when there, and spoke of it after returning, I am sure many of them, if they live till ninety, will remember that one day, and with a feeling more beneficial to their minds than any which months of ordinary schooling would be likely to produce." The next year 250 started at an early hour for Herne Bay. "On the whole," says Mr. Wilson, "I think this excursion was as completely successful as that of the previous year, both in the delight the boys derived from it, and its effects in opening and benefiting their minds."

The expense of these two trips was £76. This summer excursion is a reward to those only who stick closely to the school through the winter, and so is the cricket. Dishonour is not therefore put upon those who do not attend, but honour is put upon those who do. Many would settle this matter by simple authority—saying, "There is the school, and you shall come to it." Mr. Wilson, who is actuated by another spirit, and shows a true sympathy with those beneath him, remarks, "When it is considered how very much you are asking of a boy, in asking

him, after working hard in the factory from six in the morning till half-past five at night, to come into it again at half-past six for schooling till eight, and this for three or four days a week, during eight months together, and that this is asked, not only of the best boys, and those most eager for improvement, but of all the very mixed set which such a factory as ours necessarily contains, you will not be surprised that, while always holding out the improvement as the grand inducement to belong to the school, we are glad with the general run of them to avail ourselves of all other inducements also."

I have yet to say much concerning the manner in which the adults of the establishment are treated, and the humanizing effects of the course pursued by the Messrs. Wilson. I have also to show that the company's dividends are very much increased since this system has been employed, and that the proprietors are so well satisfied with the expenditure made in these matters that they have requested to be allowed to bear the burden of the educational and other plans for the future, and to re-imburse the Messrs. Wilson the amount they have laid out.

It is impossible to state the direct pecuniary advantage to the company from all that has been done, and is doing. *One can only say, that the whole spirit of a factory, such as this is now in prospect of becoming, will be different from that of one in which the giving and taking of wages is the only connexion between the proprietors and their people.*

No. XII.

OTHER FORMS OF THE EQUITABLE WAGE PRINCIPLE.

To continue the report of the doings at Belmont factory works, it must be observed that the increasing demand for school-room obliged the Messrs. Wilson to build a room on the top of the original school, at an expenditure of £276. The total number of children belonging to the evening school of the two rooms was two hundred and eleven. Then there was a school-room engaged, and furnished for the use of the girls, at a further expense. Subsequently the educational plans, and the religious and moral culture of the establishment, were placed under the control and superintendence of a chaplin. After this a chapel was built for the the work-people, and the day's work was commenced and finished by an act of worship. Morning and evening the chaplain was thoroughly employed in the schools, and in the afternoon he visited the sick, &c.

These amounts for educational purposes, and for the chapel, added to which are other smaller items, which from want of room I must omit, make a total £3,289 for the whole past expense to December '52, and a sum of £1,105 for the whole present annual expense!

Up to this point the proprietors had taken no share in what was going on. That the work-people employed by their capital were thus treated was not generally known. The directors, however, caught wind of what was on foot, and desired that a report should be made at a general meeting "as to the nature and extent of education at present available to the children and adults employed at the company's works, the outlay incurred, &c., the nature and extent of religious instruction available for the work-people and their families in the employ of the company, and the facilities afforded them for attending public worship or otherwise, and the suggestions as to the course it may be expedient for the company to adopt on these heads, and the nature of the propositions which it may be advisable to submit for the sanction of the proprietors." Mr. Wilson wrote a letter to the gentleman authorised to draw up the report, stating all the particulars of the case, and from this I have extracted. In the postscript of his letter he says, "If you think fit to submit our educational question to the proprietors at their coming meeting, their decision will involve a principle affecting wider interests than the concerns of our factory. It will bring with it their answer to the question on which we have so often had conversation at the board—What are the duties of the directors of a trading company, and, indeed, the duties of the company itself? Is such a company only bound to give an honest living to the young people who work for it, leaving all other care of them to the general institutions of the country, and to parental and other individual exertion? Or is it bound to take, also, a moral charge over them, and to provide in the factory system itself counteracting influences to those evil ones which are sure to spring up and to spread rapidly in any collection of young people of this class, if left to take care of themselves? Now, if the separation of the owners of capital from those by whose labour it fructifies, which is looked upon as forming the chief danger of England at this moment, can be completely counteracted by the introduction *into the very business system* of such a company certain arrangements to form the working part of the association to such a character as will keep them in full sympathy with their employers, by the possession of the same ideas and feelings, and, to some extent, the same intellectual culture, *and if these arrangements shall be declared by a deliberate law of the proprietors to be an essential part of their system of business*, and, as such, to be attended to by the directors to whom they entrust that business, as carefully as anything else in it, am I not right in saying that the recognition of such a principle by even one powerful company will be a matter of national importance? Will not this one fact be worth all the theoretical books upon masters and men that have ever been written?"

The report speaks in very conclusive and high

terms of Mr. Wilson's system. After presenting the items of expenditure, and stating that all expenses had been defrayed by Mr. Wilson "from his own moneys," it goes on to say, "Inasmuch as the children employed in the factories would, but for schools especially adapted to factory hours, be prevented from obtaining any education at all, your committee think that it is the clear duty of the company to continue the present schools, *and so to provide for the intellectual and moral welfare of those by whose labours every shareholder profits.*

"The cricket ground and summer excursion seem to add so much to the efficiency of these schools, that your committee think they should be continued. The reimbursement of the sums already expended on the schools, &c., by Mr. Wilson constitute a third question, &c. **** Your committee have no doubt that the system of education introduced by Mr. J. Wilson has a direct bearing on the efficiency of the work done, and *pro tanto* on the pecuniary success of the company; and with reference to this point, would specially call attention to the employment of boy-labour in work with which boys would not formerly have been intrusted, and which was, therefore, always performed by men, until, to save expense, machinery was for some time entirely substituted for hand-labour, but without obtaining that perfect execution of the particular task which nothing but hand-labour has hitherto been able to insure, &c."

Now, this report and Mr. Wilson's letter were not read at the general meeting, but both were printed and circulated some time beforehand amongst the proprietors, so that the line of conduct determined upon was *deliberately struck out*—not hastily adopted.

The first resolution proposed to the meeting was as follows:—

"That the shareholders, cordially coinciding in the views of the company's duty with regard to education, which are expressed in the report presented by the educational committee to the directors, authorise the directors to expend a sum not exceeding £900 per annum in maintaining the educational system now in operation in connexion with the company's factories."

After some discussion, this resolution was passed with only *one* dissentient, who subsequently became a consentient. I believe the second resolution was to this effect:—

"That the company authorise the directors to expend a further sum, not exceeding £300 annually, in order to provide means of public worship for such of their work-people as may require and choose to avail themselves of such means."

This resolution was passed with only one dissentient.

The next motion was to this effect:—

"That the warmest thanks of this meeting be given to Mr. J. P. Wilson, and that the expenses incurred by him in the establishment of the schools, and providing religious advantages for the work-people and children in the company's employ, be reimbursed to Mr. J. P. Wilson by this company in such manner as the directors may arrange."

Like the others, this resolution met with only one dissentient; but, curious to say, this dissentient was no other than *Mr. J. P. Wilson himself*, nor did he subsequently become consentient. The whole body of proprietors, about 400 in number, did not attend this meeting. All were, however, apprised of what was to be proposed, and from the great bulk were received letters of the highest approval.

We therefore see that the *deliberate* votes of the proprietors adopted the educational arrangements into the company's *business system*, thus giving a triumphant reply to the questions "What are the duties of the directors of a trading company? Is such a company only bound to give an honest living to the young people who work for it, leaving all other care of them to the general institutions of the country, and to parental and other individual exertions? or, in other words, Is it true that a man's wages for the actual time of his services are full return for them."

When a joint-stock company (a body without a conscience!) deems it proper to pursue such a course, a private capitalist has no ground upon which to hesitate. Let me remind my readers, that Mr. Wilson's plans were not to be executed by the private benevolence of certain shareholders, or the majority of shareholders—nothing of the sort: *they were adopted into the company's business system.* I wish I had room for the speeches that followed the propositions given above. It does one good to know that practical men of business do possess good and sound notions with respect to the relationship between master and servant—and to know, morever, that they are ready not only to write and to speak, but to *act.*

F. R. S.

DIMENSIONS OF A LINCOLNSHIRE RAM.—(To the editor of the Mark-lane Express.)—SIR,—It has often been said by many south and west of England farmers, that the Lincolnshire sheep are flat sided. To prove that they are not all so, the following dimensions were taken, about four years back, of a Lincolnshire ram, three shear bred and fed by Mr. Hodgkin, of Dyke, near Bourn, Lincolnshire. Girth in the narrowest part behind the shoulders, 5 feet 10½ inches, when naked; breadth across the hips 1 foot 10½ inches; the same over the ribs; breadth of the shoulders, 2 feet; collar thick; cut 13 lbs. of wool, 14 lbs, when a hog; stood 32 inches high. This sheep was exhibited the same year at Northampton fair, 19th September, and at Peterborough, 2nd October.—A LINCOLNSHIRE GRAZIER.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

CONSECUTIVE ANALYSIS OF THE STOCK SHOWN AT THE GLOUCESTER MEETING.

The following report from the pen of our correspondent "A Practical Farmer," has stood over longer than we could have wished. We insert it now, however, with no further apology, considering the merits of the show to amply warrant the consideration thus given to them. It will be seen, we allow our correspondent's report to stand as it was originally written, opening with a few remarks on the implement department, a branch of the exhibition that has already been as carefully dissected in the *Farmer's Magazine*.

"We have again to report another highly interesting meeting of our Royal Agricultural Society. To-day (Tuesday) has been devoted to the trial of implements, and, though we observed many of our leading agriculturists, we were disappointed as to numbers. We think it one of the most important departments of the meeting; and our farmers ought to attend, and see what improvements the manufacturers of implements have effected for them, and to ascertain for themselves the value of such improvements. We think the trial of reaping machines highly satisfactory, and as the price of labour is fast advancing, they will soon be in general request; and we must say we think a farmer would manifest great fastidiousness to object to the quantity of work done by some of them, and the manner in which it was done. We say again, we were sorry to see so few present; perhaps 500 individuals would comprise the whole number in the field. This is decidedly wrong; farmers must look out for themselves. While on this point we will further say, that the Society, as a whole, is by no means supported in that spirited way that it merits. A National Society like this—designed to provide the best and cheapest support for the population of the country, and in doing this to enhance the prosperity of one of the leading interests of the community—ought to meet with more general support. The names of every peer and commoner ought to be on its subscription list. What a comparatively paltry number of annual subscribers—under 4,000! and including all classes of subscribers, the number is under 5,000! We say it is a paltry list for such a Society. The number ought to be quadrupled, and the operations of the Society extended accordingly. Say not that they comprehend all that is requisite; far from it. We could point out many excellent classes for adoption, had we the means for payment of prizes. Why crowd so many different orders of animals in one class? Sheep, for instance: how many varieties of *Southdown sheep* have we? none but pure Downs get prizes. How many varieties of Leicesters have we? Again, of long-wools, and many others? The same, and more, with regard to cattle. We should like to see more classes and clearer distinction of breeds; the better would be our decision as breeders on seeing them in competition. Of pigs the subdivisions of breeds are remarkable; these require better identification and more classes. The breeding and fattening of pigs is becoming one of the most important departments of agriculture, and will speedily possess extraordinary influence upon the meat markets of the kingdom. It has been effective during the past spring in ruling the price of meat. No other animal can be brought to market so soon or in such great numbers; and the prolific nature of the animal, his extraordinary growth and aptitude to fatten, and that at a cheap rate, will always lead to the breeding of immense numbers. We say, these classes might be increased and defined with great benefit; but we want many more subscriptions. Poultry—This has become a very interesting feature of our exhibition, and we heartily rejoice at its adoption. We recollect that about 15 years ago the late Mr. Handley—*Henry Handley*—offered two or three prizes for poultry, to be competed for by one of the local societies in Lincolnshire. We know that he was much sneered at, for it; and it was thought beneath the dignity of most societies to accept such frivolous premiums. What has it grown to now? What would have been said then, if told that a couple of fowls would sell at 50 to 100 guineas? But see the vast improvements in the breeding of poultry, and the importance of promoting it still further: we want more and higher premiums for these classes. One great feature at this meeting is the attempt to define the condition of a breeding animal. We highly approve it, and hope it will ultimately prove successful. The judges of condition have an unenviable task; but the animals are before the world. Every one attending the show-yard may judge for himself; and if mayhap a wrong is unintentionally inflicted, a discerning public will set all right, and breeders will not be discredited in consequence. We think the view a correct one. The society's aim is to promote improvements in breeding; and though many animals will make themselves fat on the most ordinary keeping, yet there is a point they cannot reach with common feeding; hence the value of judges or juries of condition."

SHORT HORNS.

These classes did not, as a whole, quite equal those of some former years; many animals possessing very superior merit were exhibited, and in the cow and the in-calf heifer classes we do not remember to have seen better animals than those which carried off the prizes. These fully retrieved the character of shorthorns as compared with the other classes, as nothing equal to them was exhibited in the yard. Many of the bulls were very good, but none equalled that nobility of character we have seen. No "Duke of Northumberland" was there. We can only in a word or two endeavour to lead

our readers to a defect or excellency. The following are our jottings down at the time of inspection :—

CLASS I.—BULLS calved previously to the 1st of July, 1851, and not exceeding 4 years old.

1 N. Bland, of Randalls Park, Leatherhead, Surrey, a red and white bull. A well-formed animal, deep and good.

2 J. T. Robinson, of Leekby Palace, Topcliffe, near Thirsk, York, a roan bull. Has a rather thin chine, and his ribs are not sufficiently springing.

3 R. Webb, of Calcot Farm, Reading, Berks, a light roan bull. Is thick and well-formed, but rather short in frame.

4 E. Bewly, of Siddington House, near Cirencester, Gloucester, a white bull. Well formed; rather too short. Horns rather too thick, and standing out.

1101 A well-made bull with great depth of frame.

6 R. Stratton, of Broad Hinton, near Swindon, Wilts, a roan bull. Well formed, but too short and low; a deep chest, very broad hips, and loin and tail well laid in between good tuts or pot-bones, much like a good cow. 2nd prize of 20*l*.

7 E. Akroyd, of Denton Park, near Otley, York, a roan bull. A longer frame, and very useful animal.

8 E. W. S. Owen, of Condover Hall, near Shrewsbury, a roan bull. A frame of fair length; fair animal.

9 T. Robinson, of Burton-on-Trent, Stafford, a dark-red bull. Prettily formed, but rather narrow frame.

10 B. H. Allen, of Longserofts Hall, near Lichfield, Stafford, a roan bull. A thick-formed animal, but too short in frame.

11 The Right Hon. Lord Berners, of Keythorpe Hall, near Tugby, Leicester, a roan bull. A very good animal; colour, strawberry-roan; he is well formed, possesses a fine frame, but lacks that grandeur of appearance we have sometimes seen; his neck is thin, and his chine is not quite wide enough; but the ribs spring out well, and his girth is deep and good, with beautiful breast; his hips are wide, a long good rump, deep thighs, good fore-flank, back level, and head and countenance pleasing. 1st prize of 40*l*.

12 Wm. Fowle, of Market Lavington, near Devizes, Wilts, a roan bull. A good level back, ribs well thrown out, good chest, neck too slight, and frame rather too long.

13 T. Mace, of Sherborne, near Northleach, Gloucester, a white bull. A very level, well-made, good animal.

14 D. J. Niblett, Haresfield Court, near Gloucester, a white bull. This animal did no great credit to the show-yard, but was commended.

15 J. Rennie, of Penylan Maindee, near Newport, Monmouth, a roan bull. A rather small animal, but commendable in many points.

16 Wm. Tod, of Elphinstone Tower, near Tranent, Haddington, a roan bull. This animal looked rather too delicate in frame and form.

17 J. Kinder, of Sanbridge Bury, near St. Albans, Herts, a red and white bull. A good level back.

18 A. M. Tinperon, of New Barns, near St. Albans, Herts, a white bull. A very fair and useful bull.

CLASS II.—BULLS calved since the 1st of July, 1851, and more than 1 year old.

19 J. H. Elwes, of Colesbourne, near Cheltenham, Gloucester, a roan bull. Is a good bull-calf.

20 Rev. F. Thursby, of Abingdon Rectory, near Northampton, a roan bull. An ordinary animal.

21 R. Booth, of Warlaby, near Northallerton, York, a white bull. Is a well-formed animal, with beautiful level back, and tail well set; hips good and broad, thighs deep and good, good chest, the chine somewhat defective, and the head and horns a little amiss; but he possesses very symmetrical proportions, and is not surpassed by any bull in the yard. 1st prize of 25*l*.

22 C. Fielder, of Spersholt, near Winchester, Hampshire, a light roan bull. A common-looking animal.

23 H. L. Maw, of Tetley, near Crowle, Lincoln, a roan bull. Possesses good hips and tail, stands well, frame long.

24 B. H. Allen, of Longcrofts Hall, near Lichfield, Stafford, a white bull. A very neat and good frame.

25 Wm. Fletcher, of Radmanthwaite, near Mansfield, Notts, a roan bull. A very good symmetrical animal, with wide hips, long rump, capital thigh; his horns are rather queer, chine not quite broad enough, and tail rather high, but a first-rate animal. 2nd price of 15*l*.

26 T. Robinson, of Burton-on-Trent, Stafford, a roan bull. A fair and useful animal.

27 R. Stratton, of Broad Hinton, near Swindon, Wilts, a roan bull. A fair and useful animal.

28 Wm. Tod, of Tranent, Haddington, a roan bull. A fair and useful animal.

29 Wm. Woodward, of Bredon's Norton, near Tewkesbury, Worcester, a roan bull. A fair and useful animal.

1102 A very useful bull; horns rather "staggy."

CLASS III.—COWS IN-MILK OR IN-CALF.

30 N. Bland, of Randall's Park, near Leatherhead, Surrey, a red-roan cow, in-calf. This cow possesses good hips, rumps, and thighs; but rather narrow in girth, and fore-quarter and back not quite level.

31 G. Sainsbury, The Priory, Corsham, near Chippenham, Wilts, a red-and-white cow, in-calf. Moderately good.

32 G. Sainsbury, The Priory, Corsham, near Chippenham, Wilts, a roan cow, in-milk and in-calf. Fair animal; chine defective.

33 H. Smith, The Grove, Cropwell Butler, near Bingham, Notts, a roan cow, in-milk and in-calf. This is a first-rate animal in nearly every point; loins and hips very broad; tuts good, thighs good, breast very deep, chine good, ribs well springing; back straight, level, and broad, neck rather thin; a noble-looking cow. 1st prize 20*l*.

35 R. Booth, Warlaby, near Northallerton, York, a roan cow, in-milk and in-calf. A first-rate animal; broad loin, and hips rather high, round, and fat, giving her a very broad back and a slightly hollow appearance along its otherwise level top; ribs full and fat chine, broad shoulders and well out; very heavy tuts, causing her tail to look a little down. 2nd prize of 10*l*.

36 T. Ivens, of Lutterworth, Leicester, a red cow, in-milk. A rather small but well-formed good cow.

37 T. Ivens, of Lutterworth, Leicester, a roan cow, in-calf. A rather small but well-formed good cow.

38 J. Lane, of Barton Mill, Cirencester, Gloucester, a roan cow, in-milk and in-calf. A large good cow, with extraordinary rump and tuts, and stands high; a well-formed good frame.

39 J. Logan, of Maindee House, near Newport, Monmouth, a red-and-white cow, in-milk. A useful good cow, but rather small.

40 E. W. S. Owen, of Condover Hall, near Shrewsbury, a light roan cow, in-milk and in-calf. A useful old cow, of good frame.

41 E. W. S. Owen, of Condover Hall, near Shrewsbury, a light roan cow, in-milk. A very fair animal, with many good points. Commended.

42 T. Robinson, of Burton-on-Trent, Stafford, a red-and-white roan cow, in-milk. A large good cow, but uneven in her points.

43 T. Robinson, of Burton-on-Trent, Stafford, a light roan cow, in-milk. A large good animal, almost fat; capital breast, loin broad, deep and wide in frame.

44 W. J. Sadler, Bentham Purton, near Swindon, Wilts, a mottled cow, in-milk. Rather light, and delicate in frame.

45 W. Fletcher, of Radmanthwaite, near Mansfield, Notts, a roan cow, in-milk. A very good and useful cow; back level and broad, rumps good, tuts heavy and round.

46 J. H. Langston, M.P., of Sarsden House, near Chipping Norton, Oxon, a roan cow, in-milk. A fair and moderate frame.

47 J. H. Langston, M.P., of Sarsden House, near Chipping Norton, Oxon, a red-and-white cow, in-milk and in-calf. Better hips, but an ordinary animal of great length.

48 R. Stratton, of Broad Hinton, near Swindon, Wilts, a roan cow, in-milk and in-calf. A large good cow, but rather defective in her loin and chine, and girth too narrow.

50 W. Woodward, of Bredons Norton, near Tewkesbury, Worcester, a flecked roan cow, in-milk, and supposed in-calf. Her hips nicely formed, but too delicate in frame.

51 E. Bate, of Kelsterton, near Flint, a white cow, in-milk. Prettily formed, but small.

52 J. Logan, of Maindee House, near Newport, Monmouth, a roan cow, in-milk. Rather too delicate and thin.

CLASS IV.—HEIFERS IN-MILK OR IN-CALF, not exceeding 3 years old.

54 R. Booth, of Warlaby, near Northallerton, York, a roan heifer. This is a nearly perfect animal of ita kind; beautiful back, level and broad; hips not prominent, but exceedingly well formed; tuts good; deep in frame, excellent in form, and handsome in appearance. 1st prize of 15*l*.

55 R. Booth, of Warlaby, near Northallerton, York, a roan heifer. Much in character with the above. Hips and rump rather narrower, and tail standing rather high, but a well-formed, proportionate animal, of exceedingly good quality, and worthy of the 2nd prize of 10*l*.

57 E. Bowly, of Siddington House, near Cirencester, Gloucester, a light roan heifer. A very deep, good frame, but short and low standing.

58 E. Bowly, of Siddington House, near Cirencester, Gloucester, a roan heifer. A nicely-formed long frame, of fair depth; narrow girth.

60 J. Lane, of Barton Mill, near Cirencester, a white heifer. A beautiful frame, and good in girth; rather defective loin.

62 R. Stratton, of Broad Hinton, near Swindon, Wilts, a roan heifer. A good animal, but too narrow hips; and back and chine defective. Commended.

CLASS V.—YEARLING HEIFERS.

63 G. Sainsbury, the Priory, Corsham, near Chippenham, Wilts, a dark roan yearling heifer. Very good in frame; breast not good.

64 G. Sainsbury, the Priory, Corsham, near Chippenham, Wilts, a roan yearling heifer. Moderately good.

65 Right Hon. Viscount Hill, of Hawkstone, near Shrewsbury, a roan yearling heifer. Moderately good.

66 Right Hon. Viscount Hill, of Hawkstone, near Shrewsbury, a roan yearling heifer. Good and symmetrical; fore-quarter rather thin.

67 E. Bowly, of Siddington House, near Cirencester, a roan yearling heifer. Very good, with capital flank.

68 E. Bowly, of Siddington House, near Cirencester, a red-and-white yearling heifer. Very good, but uneven in some points; too fat.

69 H. L, Maw, of Tetley, near Crowle, Lincoln, a roan yearling heifer. A fair and useful heifer.

70 J. Lane, of Barton Mill, near Cirencester, a red yearling heifer. Very useful animal.

71 R. Stratton, of Broad Hinton, near Swindon, Wilts. a roan yearling heifer. Very good animal, with a beautiful top throughout, but rather defective in her plaits, flank, and "ripping" parts. 2nd prize of 5*l*.

72 R. Stratton, of Broad Hinton, near Swindon, Wilts, a roan yearling heifer. Prettily formed, but small.

73 R. Timms, of Braunstone, near Daventry, Northampton, a roan yearling heifer. A good heifer.

74 B. H. Allen, of Longcrofts Hall, near Lichfield, a white yearling heifer. A very good and beautiful form; a first-class heifer; deep and good frame throughout; if she has a defect, it is in the hips being rather too narrow; her form is nearly perfect. 1st prize of 10*l*.

75 E. Bate, of Kelsterton, near Flint, a roan yearling heifer. A well-formed animal, with beautiful level back; rather too long in frame, and somewhat unlevel in make for a first-class heifer, which she is. Commended.

HEREFORDS.

In looking over these classes we presently saw that we were in the country more particularly favoured as the district for breeding and fattening this peculiar breed. The numbers and variety shown were both varied and rather large. We never saw finer animals of any breed than some that presented themselves in these classes. Lord Berwick's bull would stand at the head of any class as of transcendent beauty, worth, and usefulness. We were not altogether satisfied with some of the decisions. we prefer nobility of appearance and equal symmetry to short legs and like symmetry. Mr. Sexty's bull is a noble animal. Mr. Monkhouse's cow is a fine specimen of a Hereford cow; so is that shown by Mr. Ackers and several others. The other classes showed well, but not in great numbers.

CLASS I.—BULLS calved previously to 1st July, 1852, and not exceeding 4 years old.

76 J. Naylor, of Leighton Hall, near Welshpool, Montgomery, a red and white bull. A short animal, of uneven frame.

77 Right Hon. Lord Berwick, of Cronkhill, near Shrewsbury, a red and white bull. This is one of the handsomest and most profitably-proportionate animals we ever saw; amazing depth of chest, and breadth of shoulder and girth; back very level and broad; chine fair, and ribs fairly springing, but rather too flat in the side. As usual, even with the best Herefords, his hips are rather narrow, and rump rather short; his quality is very fine, and his countenance very spirited. 1st prize of 40*l*.

81 G. Sexty, of Aylton, near Ledbury, Hereford, a brown and white bull. A very fine animal, with pleasant, docile looks. He possesses a deep, chest, good chine, and ribs well springing; good girth; rather long in frame from hip to chine; rump rather short, and tail low; stands high and well. Highly commended.

82 J. Carwardine, of Stockton Bury, near Leominster, Hereford, a dark brown bull. A very useful short-legged animal; low chine, and ribs not springing enough; docile looking, and tolerably proportionate. 2nd prize of 20*l*.

83 W. Taylor, of Showle Court, near Hereford, a red (with white face) bull. A large and long-framed animal, of far greater substance; his great defect is a short rump, and patchy near the tail.

85 B. Powis, of Newnham, near Tenbury, Worcester, a grey bull. A useful bull.

CLASS II.—BULLS calved since 1st July, 1851, and more than one year old.

86 E. Price, of Court House, near Leominster, Hereford, red and white bull. A very neat, well made animal, of beautiful quality and proportions, on short legs. 1st prize of 25*l*.

87 Right Hon. Lord Berwick, of Cronkhill, near Shrewsbury, a red (with white face) bull. A well-made animal, of fine quality of flesh; chine and fore-quarter a little too narrow.

88 Right Hon. Lord Berwick, of Cronkhill, near Shrewsbury, a dark red (with white face) bull. A very superior frame; his defect is in chine and girth. 2nd prize of 15*l*.

89 J. Monkhouse, of the Stow, near Hereford, a red (with white face) bull. A good animal, of deep frame; rather slender girth. Commended.

90 R. Biddulph, of the New House, near Ledbury, Hereford, a brown (with white face) bull. A fair animal; good proportions.

91 J. Walker, of Westfield House, Holmer, near Hereford, a dark brown (with white face) bull. A longer frame, but defective points.

92 W. Perry, of Cholstrey, near Leominster, Hereford, a dark red (with white face) bull. An ordinary animal.

93 W. Taylor, of Showle Court, near Hereford, a red (with white face) bull. A useful animal; sides too flat.

CLASS III.—Cows in milk or in calf.

94 J. Ackers, of Prinknash Park, near Painswick, Gloucester, a dark brown (with white face) cow. A very good and well-made cow, with calf by her side; large frame, and noble looking. 2nd prize of 10*l*.

95 Right Hon. Lord Berwick, of Cronkhill, near Shrewsbury, a red (with white face) cow. A very useful cow; back low and hollow.

96 Right Hon. Lord Berwick, of Cronkhill, near Shrewsbury,

a grey (with white face) cow. A very even, good frame; neck rather thin. Commended.

97 P. Turner, The Leen, Pembridge, Bereford, grey (with white face) cow. A very thick form, and short frame.

99 J. Monkhouse, of the Stow, near Hereford, a white face Cow. A very good and noble looking animal; hips very broad; rump rather short; loin rather low; breast exceedingly good; plaits comparatively thin; a fine specimen of a Hereford cow. 1st prize of 20*l*.

100 R. Biddulph, of the New House, near Ledbury, Hereford, a brown (with white face) cow. Too delicate in frame.

101 J. Walker, of Westfield House, Holmer, near Hereford, a brown (with white face) cow. A useful cow; good calf.

102 J. Walker, of Westfield House, Holmer, near Hereford, a brown (with white face) cow. A fair, profitable cow; good calf.

103 J. Barrett, of Ross, Hereford, a light brown (with white face) cow. A good cow, but uneven frame.

104 W. Bennett, of North Cerney, near Cirencester, a dark brown cow. A good cow; hind quarters very good; chine and girth defective.

CLASS 4.—HEIFERS in-milk or in-calf, not exceeding three years old.

105 W. Maybery, of Brecon, a brown and white heifer. A good and profitable heifer—highly commended.

106 The Right Hon. the Lord Berwick, of Cronkhill, near Shrewsbury, a red heifer. Very good, and of first-rate quality; fat, and uneven in her feeding. 1st prize of 15*l*.

107 W. Stedman, of Bedstone Hall, near Ludlow, Salop, a a blood red (with white face) heifer. A larger animal, of fine shape.

108 P. Turner, of the Leen, Pembridge, near Leominster, a red (with white face) heifer. A very thick, well-formed animal, deep and good frame. 2nd prize of 10*l*.

109 J. T. Morgan, of Dairy Crug, near Brecon, a brown and white heifer. A tail and noble looking heifer.

111 E. Williams, of Llewes Court, near Hay, Brecon, a brown heifer. Small, but very fine in quality—commended.

CLASS 5.—YEARLING HEIFERS.

112 W. Mayberry, of Brecon, a brown and white yearling heifer. A well formed heifer; rather narrow.

113 W. Mayberry, of Brecon, a brown and white yearling heifer. Good, but uneven in frame.

114 E. Price, of Court House, Pembridge, near Leominster, a red and white yearling heifer. A very handsome heifer, but chine too high and narrow, and neck thin. Prize of 10*l*.

115 J. Nayler, of Leighton Hall, near Welshpool, Montgomery, a red and white yearling heifer. A straight and even back; girth narrow—commended.

116 W. Stedman, of Bedstone Hall, near Ludlow, Salop, a red and white yearling heifer. Prettily formed.

117 J. Walker, of Westfield House, near Hereford, a brown (with white face) yearling heifer. A broad, well made animal; neck rather thin.

118 W. Bennett, of North Cerney, Cirencester, a light brown yearling heifer. Small, with defective girth.

DEVONS.

These classes presented to us the greatest symmetry and beauty, and the quality of their flesh is pre-eminently fine; the offal is very slight, and their sleek and delicate appearance is much in their favour; they may be, and undoubtedly are, well adapted to high lands and mountain pasturage, but we think both short-horns and Herefords much more profitable for general usefulness: we breed small pigs because we can get them fat in very early life; but we much doubt if these beautiful little Devons will attain to much earlier maturity than the larger breeds. We greatly admire their proportionate beauty and delicacy of appearance, but we demur to the profitableness of the breed generally. The richer lands of Devonshire will graze any good animal to profit; the moors may require a lesser breed. The most profitable animals are those that will grow satisfactorily while they are moving towards maturity: a little compact animal will fatten well, but it cannot attain to a large weight. If the Devons are better breeders, or possess other qualifications better than their beauty, it may form a good reason for upholding such a small and delicate breed; but if they possess no qualifications beyond those possessed by the short-horn or Herefords, they ought, notwithstanding, to be discouraged, if not altogether discountenanced, as a profitable breed of cattle. We say again we must produce more meat in less time, and all lands adapted to the production of large animals ought to possess them. We would suit the animal to the pasture, as being in our opinion the most profitable mode of grazing.

CLASS 1.—BULLS calved previously to the 1st of July, 1851, and not exceeding 4 years old.

119 J. Talbot, of Temple Quiting, near Cheltenham, a dark red bull. This is not a very good animal.

120 R. Wright, of Moor Farm, Taunton, Somersetshire, a red bull. A very good and noble looking fellow, of beautiful quality, great depth, and good substance; chine good, but ribs come down suddenly, making flat sides; hips too near, and rumps too narrow. 2nd prize of 20*l*.

121 G. Turner, of Barton, near Exeter, a red bull. Possesses beautiful symmetry and correct proportions; his quality of flesh very fine; his flank is extraordinary, but his hips are rather too narrow; as are also his tuts; tail set rather high. 1st prize of 40*l*.

122 T. W. Fouracre, of Durston, near Taunton, a light red bull. Fair animal.

123 S. Farthing, of Stowey Court, near Bridgewater, a red bull. A good, well made bull.

124 J. Hole, of Knowle House, Dunster, Somerset, a red bull. Just passable.

126 J. Tucker, of Yard Farm, Staplegrove, near Taunton, a red bull. A useful bull, but uneven in form. Commended.

CLASS 2.—BULLS calved since the 1st of July, 1851, and more than 1 year old.

128 G. Turner, of Barton, near Exeter, a red bull. This is a very handsome and complete animal. 1st prize of 25*l*.

130 W. M. Gibbs, of Bishop's Lydeard, near Taunton, a bull. Rather uneven in frame.

132 S. Farthing, of Stowey Court, near Bridgewater, a red bull. A good frame, but hips too narrow, and queerly formed about the tail. 2nd prize of 15*l*.

133 S. Farthing, of Stowey Court, near Bridgewater, a red bull. Very pretty in appearance, but not correct in form. Highly commended.

134 G. Goode, of Croft Cottage, Carmarthen, a red bull. Fair and useful animal.

135 J. Tucker, of Yard Farm, Staplegrove, near Taunton, a red bull. Prettily formed, and nice back.

CLASS 3.—COWS IN-MILK OR IN-CALF.

136 Rev. C. Smith, of Lydeard House, near Taunton, a red cow. A very good cow; hips wide, and tail well set; too fat.

137 J. Talbot, of Temple Guiting, near Cheltenham, a dark red cow. Very much out of condition, and small.

138 J. Talbot, of Temple Guiting, near Cheltenham, a dark red cow. Very much out of condition, and small.

139 W. Hole, of Hannaford, near Barnstaple, Devon, a light red cow. Very much out of condition, and small.

140 W. Hole, of Hannaford, near Barnstaple, Devon, a dark red cow. A little better condition.

141 W. Hole, of Hannaford, near Barnstaple, Devon, a dark red cow. Is a fair useful cow.
142 G. Turner, of Barton, near Exeter, a red cow. A prettily formed animal, of fine quality; hips and tuts good; rather small; the hind quarter good throughout. 1st prize of 20*l*.
143 G. Turner, of Barton, near Exeter, a red cow. Is a contrast to the above; she has a very good fore quarter; but indifferent hips, rumps, and tuts. 2nd prize of 10*l*.
144 T. Webber, of Holberton Court, near Tiverton, Devon, a red cow. Very good and useful. Commended.
145 W. M. Gibbs, of Bishop's Lydeard, near Taunton, a cow. Very good and well formed. Highly commended.
147 S. Farthing, of Stowey Court, near Bridgwater, a red cow. Good cow.
148 J. Hole, of Knowle House, near Dunster, Somerset, a red cow. Is a very useful poor cow. Highly commended.
149 J. Tucker, of Yard Farm, Staplegrove, near Taunton, a red cow. Is a good animal, and well formed.

Class 4.—Heifers in-milk or in-calf, not exceeding 3 years old.

151 W. Hole, of Haunaford, near Barnstaple, Devon, a light red heifer. Not very creditable to the show.
152 G. Turner, of Barton, near Exeter, a red heifer. A beautiful animal in every respect. 1st prize of 15*l*.
153 T. Webber, of Halberton Court, near Tiverton, a red heifer. Not good.
154 T. Webber, of Halberton Court, near Tiverton, a red heifer. Not good.
155 T. Webber, of Halberton Court, near Tiverton, a red heifer. Not good.
156 W. M. Gibbs, of Bishop's Lydeard, near Taunton, a heifer. Good in form, but neck rather thin. Highly commended.
157 J. Hole, of Knowle House, near Dunster, Somerset, a red heifer. Good in frame, but neck also thin.
158 J. Hole, of Knowle House, near Dunster, Somerset, a red heifer. Possesses a beautiful frame, and fine quality. 2nd prize of 10*l*.
159 A. Umbers, of Weston Hall, near Leamington Spa, Warwick, a heifer. Beautiful form, but small and fine in quality; commended.
160 A. Umbers, of Weston Hall, near Leamington Spa, Warwick, a heifer. Beautiful in form, but small and fine in quality; commended.
161 J. Tucker, of Yard Farm, Staplegrove, near Taunton, a red heifer. Too large and heavy for class, very fat.

Class V.—Yearling Heifers.

162 Rev. C. Smith, of Lydeard House, near Taunton, a red yearling heifer. Pretty frame, and very neat; commended.
163 Rev. C. Smith, of Lydeard House, near Taunton, a red yearling heifer. A very pretty little heifer; commended.
164 J. Talbot, of Temple Guiting, near Cheltenham, a dark red yearling heifer. Not good.
165 H. D. Seymour, of Knoyle House, Hindon, Wilts, a brown yearling heifer. Not good.
166 J. Talbot, of Temple Guiting, near Cheltenham, a red yearling heifer.
167 G. Turner, of Barton, near Exeter, a red yearling heifer. A very pretty and good animal; highly commended.
168 J. Quartley, of Molland House, near South Molton, Devon, a red yearling heifer. A very pretty animal, good frame, and most beautiful quality; first prize of £10.
169 J. Quartley, of Molland House, near South Molton, Devon, a red yearling heifer. An excellent duplicate of the above; second prize of £5.
170 S. Farthing, of Stowey Court, near Bridgwater, a red yearling heifer. Good and profitable; commended.
171 J. Hole, of Knowle House, near Dunster, Somerset, a red yearling heifer. Fair, useful, and well formed; highly commended.
172 J. Hole, of Knowle House, near Dunster, Somerset, a red yearling heifer. Good and very pretty; highly commended.
173 A. Umbers, of Weston Hall, near Leamington Spa, Warwick, a yearling heifer. Rather thin and narrow in frame.

WELSH BREED.

Class I.—Bulls calved previously to the 1st July, 1851 and not exceeding 4 years old.

No entry.

Class II.—Bulls calved since the 1st of July, 1851, and more than 1 year old.

175 W. Powell, of Eglwysnewydd, Margam-Taibach, Glamorgan, a dark brown and white bull. A very ordinary animal, not good in any point; prize of £10.

Class III.—Cows in-milk or in-calf.

176 G. Goode, of Croft Cottage, Carmarthen, a black cow. Long and queerly formed; 2nd prize, £5.
177 W. Powell, of Eglwysnewydd, Margam-Taibach, Glamorgan, a black and white cow. Better form, but too delicate in frame; 1st prize, £10.

Class IV.—Heifers in-milk or in-calf, not exceeding 3 years old.

178 William Powell, of Eglwysnewydd, Margam-Taibach, a brown and white in-calf heifer. This is a fairly-formed useful heifer; 1st prize, £10.

Class V.—Yearling Heifers.

179 G. Goode, of Croft Cottage, Carmarthen, a black yearling heifer. A very unpromising animal; prize of £5.

The Welsh classes were wretchedly competed for. We heard one of the judges in some of the classes, but a stranger to us, say he valued the lot at about the value of the prizes.

OTHER BREEDS.

Class I.—Bulls calved previously to the 1st of July, 1851, and not exceeding 4 years old.

180 The Rev. T. Williams, of Tir-y-cwm-ystrad, near Swansea, a West Highland brindled bull. Not shown.
181 N. G. Barthropp, of Cretingham Rookery, Woodbridge, Suffolk, a Suffolk red bull. A fair Suffolk bull, of good depth and level back, but bad chine and flat sides; 1st prize, £10.
182 E. David, of Fairwater House, Cardiff, Glamorgan, a white and yellow Ayrshire bull. Not good.

Class II.—Bulls calved since the 1st of July, 1851, and more than 1 year old.

183 S. Burbery, of Wroxhall, Warwick, a white long-horned bull. Not good, but possesses merit; first prize, £10.

Class III.—Cows in-milk or in-calf.

184 S. Burbery, of Wroxhall, Warwick, a brindled and white spotted long-horned cow. A rather long but good and useful cow; commended.
185 W. C. Cartwright, of Aynhoe Park, Brackley, Northampton, a black Angus polled cow. Not shown.
186 W. C. Cartwright, of Aynhoe Park, Brackley, Northampton, a black Angus polled cow.
187 E. David, of Fairwater House, Cardiff, Glamorgan, a liver-coloured and white Ayrshire cow. Rather long frame, but fair animal.
188 E. David, of Fairwater House, Cardiff, Glamorgan, a liver-coloured black and white Ayrshire cow. Not good, back defective.
190 Captain Ingle, of Thorpe, Tanworth, Stafford, a red and white long horned cow. A good long horned cow; prize of £10.

Class IV.—Heifers in milk or in calf not exceeding 3 years old.

194 E. Cane, of Berwick Court, Alfreston, Lewes, Sussex, a red Sussex heifer. A pretty and useful Sussex heifer; prize of £5.

Class V.—Yearling Heifers.

196 S. Burbery, of Wroxhall, Warwick, a brown, red, and white long horned yearling heifer. A fair animal, but not good.
197 W. C. Cartwright, of Aynhoe Park, Brackley, Northamp-

ton, a black Angus polled yearling heifer. A useful heifer, with some merit; prize of £5.

198 E. David, of Fairwater House, Cardiff, Glamorgan, a yellow or liver coloured and white Ayrshire yearling heifer. Not good.

199 E. Cane, of Berwick Court, Alfreston, Lewes, Sussex, a red Sussex yearling heifer. A fair, useful Sussex heifer; highly commended.

These classes are not well sustained; we hope another year to see much greater competition. The latter class is open to many breeds, particularly long-horns. We have often seen some very good animals of this kind, but this year there was a great deficiency. The Suffolks and Norfolks are good milkers, and possess other good qualities; why not exhibit more of them? We would earnestly invite more competition in this class for next year; if they are worth breeding, it is to the interest of individual breeders to exhibit their stock; if not, the sooner they are dispensed with the better. The long-horns are a very good milking breed—let us have more of them. Who does not remember the splendid long-horned bull shown at the Oxford meeting! The Welch breed was wofully represented—surely our Welsh breeders can excel these. Our Sussex breed was at all events not numerously represented; and our Scotch breeds had scarcely a representative. The Ayrshires, known as one of our best milking breeds, had only three representatives, and some of these of somewhat doubtful character. We would not have it so. We call upon our readers to exert themselves to obtain more subscribers, in order that better prizes may be offered; for in this lies the difficulty. Who would send a good animal 200 or 300 miles with the mere chance of obtaining a small prize of £5? Breeders like honour well enough, but that is not all; it is a greater credit to win a prize of £10 than merely to win £5: the competition is assuredly greater, and always will be.

HORSES.

The researches of our correspondent, "A Practical Farmer," have already done full justice to the different varieties of Cattle exhibited at Gloucester. He now proceeds to the Horses; and, as will be observed, with a higher opinion of those in the classes devoted to "Agricultural purposes" than the public generally were inclined to admit. In his own words, however, we would premise that "such short notes must manifestly be very imperfect;" the more particularly where no opportunity is allowed of testing the action of the animal. In this respect the Royal Agricultural Society is far behind some other meetings of the same character. Either York or Ipswich might offer an example.

CLASS I.—STALLIONS for Agricultural Purposes, foaled previously to the 1st of January, 1851.

200 J. Crump, of Grafton, near Tewkesbury, Gloucestershire, a dark brown cart stallion. A fine animal, of noble appearance and well made, though rather light in body—his legs overdone; commended.

201 H. Taylor, of Bishopstone, near Faringden, Berks, a black cart stallion. Thick form, good legs.

202 G. Thomas, of Shirehampton, near Bristol, a dappled brown pure cart stallion. Very pleasing-looking horse, short, rather narrow.

203 C. Gillett, of Foss Bridge, near Andoversford, Gloucestershire, a dappled brown pure cart stallion. Strong legs and thick-made body, a good horse.

204 S. Perkins, Woodhouse Bodenham, near Leominster, Herefordshire, a roan cart stallion. Rather small animal, but well formed.

205 E. Browning, of Bulmer-Kitchen Farm, Sudbury, Suffolk, a chestnut pure Suffolk stallion. Good legs, fine forward neck and head, buttocks or quarters high, body long.

206 T. Dunckley, of Staverton, near Daventry, Northampton, a black cart stallion. A very good horse; highly commended.

207 T. Earl, of Saint Mary Hill, near Cowbridge, Glamorgan, a bay cart stallion. Ordinary horse.

208 H. D. Seymour, of Knoyle House, near Hindon, Wilts, a chestnut true Suffolk stallion. Good legs, head not good, too thick.

209 H. D. Seymour, a dark chestnut true Suffolk stallion. Rather small, but compact.

210 Newman and Langbridge, of Priestbury, near Cheltenham, a brown cart stallion. A fine horse, legs rather weak, good form, head and neck short.

211 C. Wilson, of Elbury Hill, near Worcester, a grey cart stallion. A fine-looking horse, with ordinary legs, short neck, and small eyes.

212 R. Choyce, of Bramcote Hall, near Tamworth, Warwick, a black Leicester stallion. Not good, narrow in frame.

213 S. and R. Spencer, of Daventry, Northampton, a grey cart stallion. A good horse, body well formed, and good legs.

214 Earl Bathurst, of Cirencester, a bright chestnut thoroughbred Suffolk stallion. A good frame and form, but small, legs good.

215 H. Harbidge, of Donnington, near Stow-on-the-Wold, Gloucestershire, a chestnut Suffolk stallion. Slight body, thin and tall, hind legs light, very active.

216 M. Anger, of Ashbury, near Faringdon, Berks, a chestnut cart stallion. A thick, well-made horse.

217 J. E. Ball, of South Creake, near Fakenham, Norfolk, a bay pure cart stallion. Not present.

218 N. G. Barthropp, of Cretingham Rookery, near Woodbridge, Suffolk, a chestnut Suffolk stallion. Upstanding, good horse, too high on buttocks or quarters.

219 S. Clayden, of Little Linton, near Linton, Cambridge, a chestnut Suffolk stallion. A very handsome, well-formed horse, complete in frame, with good legs and fine countenance—not a large horse; 1st prize of £30 (see previous report).

220 W. Greenaway, of Even Swindon, near Swindon, Wilts, a grey cart stallion. A large, good horse, of handsome frame; highly commended.

221 J. Odams, of 2, Horton Villas, Camden-road, Holloway, Middlesex, a dark grey half-bred Suffolk stallion. A fine topped horse, with rather light legs.

222 T. K. Bickell, of Milton Abbott, near Tavistock, Devon, a dark chestnut Suffolk Punch stallion. A handsome and useful horse.

223 R. Langham, of Littleworth, near Faringdon, Berks, a chestnut cart stallion. Useful, ordinary horse.

224 T. Miles, of St. Briavel's, near Coliford, Gloucestershire, a black cart stallion. Not shown.

226 E. and G. Wilkinson, of Marlesford, near Wickham Market, Suffolk, a chestnut Suffolk stallion.

227 W. Wilson, of Ashbocking, near Ipswich, Suffolk, a chestnut true Suffolk stallion. A capital horse, well formed, deep in frame and good legs; 2nd prize of £15 (see previous report).

228 A. Gibbon, of Staunton, near Coleford, Gloucestershire, a dark cart stallion.

229 T. Groves, of Plumpton Hall, near Harrogate, Yorkshire, a brown cart stallion. A handsome, sprightly horse, rather light thighs and legs, very active.

230 G. Limbsick, of Horton, near Chipping Sodbury, Gloucestershire, a dark chestnut Leicester stallion. A coarse and heavy horse.

231 J. Bostock, of Spout-street, near Leek, Stafford, a dappled-grey cart stallion. A useful, common cart-horse, of great power.

CLASS II.—STALLIONS for Agricultural Purposes, Foaled since the 1st of January, 1851.

232 J. H. Elwes, of Colesbourne, near Cheltenham, a bay Gloucestershire stallion.

233 H. Crawshay, of Oaklands Park, near Newnham, Gloucester, a roan half-bred cart stallion. Light enough for a roadster.

234 T. Thomas, of Ty-draw Lantrithyd, near Cowbridge, Glamorgan, a bay Hereford and Scotch stallion. This is a good colt.

235 Lord Hill, of Hawkstone, near Shrewsbury, Salop, a chesnut Suffolk stallion. A very useful colt, good legs and active looking.

236 H. D. Seymour, of Knoyle House, near Hindon, Wilts, a chesnut pure-bred Suffolk stallion. A sprightly good colt.

237 F. T. Bryan, of Knossington, near Oakham, Rutland, a brown pure cart stallion. A fair useful animal.

238 G. Sexton, of Thorrington Hall, Wherstead, near Ipswich, a chesnut pure Suffolk stallion. Beautiful in form and colour, good legs, back rather short; 2nd prize (see previous report).

239 T. B. Browne, of Hampen, near Andoversford, Gloucester, a chesnut Suffolk stallion. A fair useful colt.

240 T. B. Browne, of Hampen, near Andoversford, Gloucester, a red chesnut Suffolk stallion. Too small, an ordinary horse.

241 C. Wilson, of Elbury Hill, near Worcester, a grey cart stallion. A good useful cart colt.

242 W. Wilson, of Ashbocking, near Ipswich, Suffolk, a chesnut pure Suffolk stallion. A well-formed body, pleasant looks, good colour, a good horse; commended.

243 F. L. Popham, of Littlecott, Wilts, near Hungerford, a brown pure cart stallion. A good useful colt, with cleanly legs and good looks; highly commended.

244 N. G. Barthropp, of Cretingham Rookery, near Woodbridge, Suffolk, a chesnut Suffolk stallion. A very lively nice colt, but small.

245 I. Everett, of Capel, near Ipswich, a chesnut Suffolk stallion. A good size, but not compact in form.

246 J. Ward, of East Mersea, near Colchester, Essex, a chesnut Suffolk stallion. A splendid colt in every respect, legs very powerful and clean; 1st prize, £20 (see previous report).

247 J. Ramsbottom, of Bitham Grange, near Doncaster, a dark brown cart stallion. By no means first-rate; commended. (Why?)

248 The Earl of Jersey, of Middleton Stoney, near Bicester, Oxford, a chesnut Suffolk stallion. A very useful horse; commended.

249 W. Melsome, of Norton Bavant, near Warminster, a chesnut Suffolk and Wilts stallion. A nice colt enough; commended.

250 G. Townshend, of Sapcote Fields, near Hinckley, Leicester, a brown Leicester stallion.

251 Lord St. John, of Melchbourne, near Higham Ferrers, a dark grey Northampton stallion. A good colt, rather long back.

251A W. Tod, of Tranent, Haddington, a bay Clydesdale stallion. A very prettily-formed colt, rather light make.

Class III.—Roadster Stallions.

252 G. Goode, of Croft Cottage, Carmarthen, a bay half-bred stallion. A rather long back, ordinary head and looks.

253 G. Jesty, of Druce Farm, near Dorchester, a dark brown stallion. A fine horse, with great symmetry, and blood-looking.

254 J. Midwinter, of Kineton, near Moreton-in-Marsh, Gloucester, a chesnut half-bred stallion. An ordinary strong horse.

255 W. Lewis, of Ewyas Harold, near Hereford, a bay half-bred stallion. Common looking horse, with light legs.

256 J. Villar, of Leckhampton Farm, near Cheltenham, a bay thoroughbred stallion. A likely-looking horse, with overdone legs.

257 W. Chambers, jun., of Llanelly House, near Llanelly, Carmarthen, a brown Welsh cob stallion. A strong horse, not unlike butchers' fashion.

258 W. Dray, of Swan Lane, London, a dark grey or roan Suffolk stallion.

259 T. Groves, of Plompton Hall, near Harrogate, Yorkshire, a brown stallion. A useful good roadster, qualified for his class, and worthy of it.

260 J. Lister, of Addingham, near Otley, Yorkshire, a bright bay half-bred stallion. A very prettily-formed and good-looking hackney horse; prize of £15 (see previous report).

261 J. Norris, of Gostling's Hall, near Debenham, Suffolk, a bay brown Yorkshire stallion. Not good.

Class IV.—Stallion Ponies.

262 J. Boughton, of Adsett Court, near Westbury-upon-Severn, Gloucester, a Welsh stallion pony. A pleasant-looking pony.

263 Rev. P. H. Morgan, of Devynnock, near Senny Bridge, Brecon, a dark brown mountain stallion pony. Not good enough for the show.

264 Rev. T. Williams, of Tir-y-cwm-ystrad, near Swansea, Glamorgan, a grey Welsh mountain stallion pony. A very strong good cob pony; prize of £10 (see previous report).

265 Rev. T. Williams, of Tir-y-cwm-ystrad, near Swansea, Glamorgan, a dark grey Welsh mountain stallion pony. A neat-framed pony.

266 Rev. T. Williams, of Tir-y-cwm-ystrad, near Swansea, Glamorgan, a roan Welsh mountain stallion pony. A neat-framed pony.

267 J. T. Harrison, of Frocester Court, near Stroud, Gloucester, a dark grey Shetland stallion pony. A neat-framed pony, but very small.

268 J. T. Harrison, of Frocester Court, near Stroud, Gloucester, a dun Shetland stallion pony. A neat-framed pony, but very small.

269 W. Bennett, of North Cerney, near Cirencester, a dark brown Welsh stallion pony. Very light, and very small.

270 J. Steed, of the Brewery, Baldock, Hertford, a spotted roan chesnut stallion pony. A very fanciful colour, but a nice pony.

271 R. Sewell, of Little Oakley Hall, near Harwich, Essex, a chesnut stallion pony.

271A J. Rogerson, Cnewr, Senny Bridge, Brecon, a cream-coloured Breconshire stallion pony. A useful fair pony.

Class 5.—Mares and Foals for Agricultural Purposes.

272 F. Barlow, of The Shrubbery, Hasketon, near Woodbridge, Suffolk, a chesnut Suffolk mare and foal. A capital mare; back rather too long.

273 J. H. Elwes, of Colesbourne, near Cheltenham, a bay mare and foal. A fair, useful cart mare.

274 F. Noyes, of The Cottage, Salisbury, Wilts, a chesnut Suffolk mare. A good mare; thick, and well made.

275 S. Druce, of Eynsham, near Oxford, a chesnut Suffolk mare and foal. A rather small made mare.

276 H. Bailey, of Walgaston Farm, near Berkeley, Gloucester, a dark brown cart mare and foal. A very good mare, and capital frame, but rather small; good foal, and fat (see previous report). 1st prize of 20*l*.

277 T. B. Browne, of Hampen, near Andoversford, Gloucester, a chesnut Suffolk mare and foal. A well made good mare; foal not so good.

279 R. Biddulph, of New House, near Ledbury, Hereford, a grey cart mare and foal. Beautiful colour; a useful mare and foal.

280 N. G. Barthropp, of Cretingham Rookery, near Woodbridge, Suffolk, a chesnut Suffolk mare and foal. A good mare, large, and fine looking; why missed?

281 H. Watts, of Whitminster House, near Stroud, Gloucester, a brown Gloucestershire mare and foal. A very large mare, but not so good in frame. Commended.

282 Lord St. John, of Melchbourne, near Higham Ferrers, Northampton, a brown Northamptonshire mare and foal. A very good mare, good legs; low on her withers. Commended.

Class 6.—Mare Ponies.

283 Rev. T. Williams, of Tyr-y-cwm-ystrad, near Swansea, Glamorgan, a roan Welsh mountain mare pony. A poor little thing.

1104 A nice little pony.

284 Rev. T. Williams, of Tir-y-cwm-ystrad, near Swansea, Glamorgan, a grey Welsh mountain mare pony. A small and ordinary pony.

1105 A very good pony, and fat (see previous report). Prize 5*l*.

286 M. Newman, of Court Farm, Hayes, near Uxbridge, Middlesex, a bay Norfolk mare pony. A pretty pony.
287 Rev. T. Williams, of Tir-y-cwm-ystrad, Swansea, Glamorgan, a black Welsh mountain mare pony. Very ordinary.
288 J. Matthews, of Boulsdon, near Newent, Gloucester, a chesnut mare pony. A clever, quick pony.
289 P. H. Morgan, of Devynnock, near Senny Bridge, Brecon, a dark brown Brecon forest mare pony.
290 J. Dunderdall, of Dudshill Court, Clifton-on-Teme, near Worcester, a brown Welsh mare pony. A good little thing.

CLASS 7.—TWO-YEAR OLD FILLIES FOR AGRICULTURAL PURPOSES.

291 J. H. Elwes, of Colesbourne, near Cheltenham, a dark bay Gloucestershire filly. A very good and useful cart filly.
292 W. Timms, of Grandborough, near Southam, Warwick, a bay cart filly. A good active, pleasant looking filly, rather light.
293 T. B. Browne, of Hampen, Andoversford, Gloucestershire, a chesnut Suffolk filly. A well formed good Suffolk filly; capital frame (see previous report). 1st prize of 15*l*.
294 J. E. Owen, of Odcott, West Ilsley, near Newbury, Berks, a pure cart filly. A very good filly; good and clean legs.
295 N. G. Barthropp, of Cretingham Rookery, near Woodbridge, Suffolk, a chesnut Suffolk filly. A fine filly; capital legs; high quarters.
296 N. G. Barthropp, of Cretingham Rookery, near Woodbridge, Suffolk, a chesnut Suffolk filly. A beautiful frame, and good throughout.

(To be continued.)

FURTHER SUGGESTIONS TO ENCOURAGE IMPROVEMENT IN BREEDING HORSES.

SIR,—When I visited the Exhibition of the Royal Agricultural Society, held at Gloucester, I was much surprised and disappointed there were so few horses to compete for the prizes offered to the very important and valuable class distinguished as "roadster stallions;" and those few which were shown possessing very moderate pretensions. There was but one thorough-bred horse in the yard, although there are many within a moderate distance of Gloucester, and some of which are quite worthy of approbation. This induced me to inquire into the cause; when I found it was a prevailing feature at agricultural meetings, &c., that owners of stallions of that kind were not generally disposed to exhibit them. It is well known to all persons conversant with breeding horses, that many thorough-bred ones, in high repute as sires of racing stock, are not the most eligible if their progeny be intended for other purposes. Numerous examples of this kind may be brought forward. Modern instances might convey invidious distinctions; but breeders who have had experience of the stock derived from Fyldener, Master Henry, and Spectre, will acknowledge that neither of them was the sire of anything with racing pretensions, although first-rate mares afforded them opportunities for distinction, and they were superior runners themselves. Nevertheless they were the progenitors of many valuable hunters and riding horses. To account for the reasons why so few of this very useful and important class of stallions are brought to the agricultural exhibitions, it may be observed that defective legs might be overlooked in candidates for racing fame, if the animal possessed the speed and properties of a Bay Middleton; while such legs would not pass muster in a hunter or hack. A head badly set on to a light weak neck, might not be a great impediment in a race-horse; but in one devoted to the purpose of carrying a lady, or one of the other sex, desirous to "witch the world with noble horsemanship" in Rotten-row, such unsymmetrical proportions would be fatal.

An owner of a country stallion in good favour is reluctant to become an exhibitor, because if he fails to gain a prize it lowers the horse in the estimation of the public—while gaining one does not raise him in an equal ratio. Every person having a mare reflects upon the misfortune of an unsuccessful competitor; but of horses belonging to those who do not make the attempt, no comments are made. There are many trifling imperfections or blemishes, which in reality, if not hereditary, are not the slightest impediments to a horse becoming the sire of very valuable and superior stock, but which might be the cause of a horse's rejection for a prize. Owners of stallions are often reluctant to submit their horses to the opinion of those who are selected as judges; and it is a difficulty which must for ever exist on subjects to be decided by opinion. Some would reject horses with bad hocks, whether for agricultural or other purposes—the judges at Gloucester did not in one of their decisions regard them in the position of insurmountable objections.

Taking all these circumstances into consideration, I am strongly impressed with the advantages which would follow the plan I proposed in your valuable columns of the 11th July last, namely, to offer premiums at local agricultural meetings for future years to the progeny of such stallions which may be examined, approved, and passed by the judges of those local societies. There are many reasons for advocating this plan, suggested by the late meeting at Gloucester, which did not occur to me in the first instance. The objections which the owners of stock horses entertain against sending them to compete for prizes would be withdrawn. They would naturally embrace the opportunity of sending horses for inspection and approval, in order to have them enrolled upon the lists as worthy of being the progenitors of their species, although they might not be disposed to compete for prizes. The approvals would be more numerous than prizes; and the increase in the number of mares would be equivalent to prizes. Another point of considerable importance would be gained: it is well known among breeders that a horse's qualification as a sire cannot be determined till the stock come into use. The prevailing colours may be bad, or they may be bad goers, or weakly in their constitutions—failings which the sire does not proclaim, but which are inherited from

his ancestors. These are all points of the greatest importance to those who breed for profit. Few breeders devote sufficient attention to minute details, which the practice of breeding with success demands. If properly studied, and the results of experience are strictly carried out, it is not the speculative concern by which it is generally characterised. Most of the events commonly accredited to luck have their origin in causes which observation and attention will in many instances detect and regulate.

It has lately been argued that the present breed of thorough-bred horses is predisposed to lameness, and fancied that, with a view to breeding for racing purposes only, they are injured by injudicious strains; an argument which the Stud-book does not corroborate. Whoever will take the trouble to examine those pages, will find the practice by no means so prevalent as it was a century ago; and, to substantiate the assertion that the national breed of horses has deteriorated, it must be done by comparison with those of former times. No one can deprecate the pernicious custom of incestuous breeding in horse or hound more strongly than myself, but I cannot find that it is either approved or practised by the majority of the most experienced and influential breeders of the day. Yours, &c.,

CECIL.

ON THE BREEDING OF HORSES.

SIR,—The letter of your able and experienced correspondent "Cecil" induces me to trouble you with a few remarks on the same subject. I am sure that he is right in saying that "owners of stallions are often reluctant to submit their horses to the opinion of those who are selected as judges." I go further than this; for I maintain that their reluctance is a well-founded one, inasmuch as the majority of decisions are based on the mere individual caprice of those who happen to be the judges for the day. For my own part, I will never in future exhibit a horse of any description until two radical changes are made in the principle on which the premiums are awarded.

1st. Let a scale of points be drawn up, by men of acknowledged authority, which is to be taken as the standard of perfection. This plan has already been adopted at the exhibitions of Guernsey cattle. No prize is there allowed to be awarded to any cow or bull which does not possess a given number of the required points. In the case of horses it might be advantageous to go further, and to make certain points essentials, and others accessories. To begin with the case mentioned by "Cecil"—that of bad hocks, which, according to him, were looked upon as a venial defect by the judges at Gloucester: I would stamp them as at once disqualifying a horse from winning a prize, either as a hunter, or as a stallion for getting hunters, even did the animal which was so unfortunate as to possess them exhibit every other merit under the sun. In like manner, malformed feet, whether contracted or too flat, ought to be a decisive disqualification for every kind of horse. All horses, too, ought to have their legs properly set on, and to possess good action, taking into account the purposes for which they are intended. I give these as indications of what I consider the essential points of a horse, but by no means as a complete list. For hunters there are others which may be classed as essential for them, although some might be dispensed with in other descriptions of horses. The hunter ought to be sufficiently well bred—*i. e.* he ought to show in his pedigree at least two crosses of blood. He ought to have sufficient power to carry at least twelve stones across the country. No horse not up to this weight ought to take a prize. In proportion as he combines the power to do more than this, with the breeding which ensures the requisite speed, and the form indicating endurance, is his value enhanced. A thorough-bred horse, well made, sound, temperate, and able to carry fifteen stone with ease, is priceless. With respect to temper, the hunter must be neither a slug, nor a fiery, impatient brute.

These cardinal points being disposed of, I pass to those which, although not essential, indicate either beauty or some useful quality, and which must therefore not be disregarded.

The shape of the head is, when symmetrical, both a mark of high blood (although many thorough-bred horses have bad heads), and denotes an animal light and pleasant in hand, especially when well set on a neck naturally arching, so as to allow of the head being drawn downwards and inwards without difficulty to the rider or distress to the horse. A star-gazer, or ewe-necked brute, though always ugly, may do useful work in harness, but would be as unsafe as unsightly for a hunter. Many persons attach importance to a horse being "well ribbed up." Provided the shape of the barrel is good, considerable latitude may be allowed on this point. The hips ought to present sufficient width; ragged hips may be unsightly, but I prefer them to those which are too narrow. A long hind-quarter is handsome, but some good horses are both short there, and goose-rumped.

These are mere hints jotted down in haste. Let a committee of experienced judges be commissioned by the Royal Agricultural Society to prepare a table of points, attending first to those which are essential to all horses; secondly, to those which are the characteristics of each separate class, whether hunters, roadsters, or farm horses; and thirdly, to those which, though not absolutely necessary, are nevertheless desirable as indications of some good quality. The breeders of horses will then be in possession of an object at which to aim. Exhibitors will have some idea as to how far the animals they send conform to the standard thus promulgated by

authority. How different, and how infinitely to be preferred from the state of affairs at present, which might be justly characterised by a slight modification of the Latin proverb, "Quot *judices*, tot sententiæ." Perplexing indeed, when selecting a horse for show, is the reflection that you have neither principle to guide you in your choice, nor clue as to what will govern the decision of your judge. Some judges prefer a large horse, others a small, compact one; one gives the palm to blood, and another to power; a third likes large bone; while a fourth is only to be propitiated by a big body. Action is everything with some persons, and nothing with others; some look at the head, others at the hocks; and a few of the more judicious are critical concerning the setting on of the fore-legs and the position of the shoulder. There is one piece of advice which I can give to exhibitors, and only one which will be of the slightest practical use: Attend above all things to the condition of the animal which you show. Let him be as fat as possible; and let his skin shine like a star. Never mind the means, but make this your aim; and if you do not win, you must either have an animal bad indeed, or your luck must be worse than your horse.

Seriously speaking, this is the only principle which I have been able to discover which invariably, and under all circumstances, governs the decisions at agricultural shows. The horse or the colt which is in the highest condition, and is best "got up," is certain to be the winner. It is melancholy that it should be so; but it is, alas! the fact that the "judges" must have something to "flatter the eye," as well as the common herd who are no judges! It is my firm conviction that no degree of merit would suffice to secure a premium to a horse thin and out of condition. I might have substituted the word "animal" for "horse," in the last sentence; but with regard to cattle or sheep, there is at least this excuse—that the "aptitude to fatten" is with them one point of perfection. Is this the case with the hunter, the hack, or even the team-horse? For my part, I call that man a "judge," in the highest sense of the word, who is able to discern merit, or the promise of it, under a rough skin and an unpampered condition, and who, on the other hand, has the strength of mind to reject a defective form, even though his eye be "flattered" by condition ever so alluring to the vulgar eye.

I must defer the discussion of the second change which I propose until another letter, should you think fit to allow me the space.

I remain, your obedient servant,

WILLOUGHBY WOOD.

Holly Bank, near Burton-on-Trent.

THE WHEAT TRADE.—No. II.

SIR,—In my former letter I pointed out the principal sources from whence our supplies of wheat are derived. I now propose to follow up the subject, by giving the best statistics I can procure of the quantity of that grain exported from the cereal districts, and also that imported into the United Kingdom. This subject will not be deemed unimportant, when we reflect that the consumption of the kingdom is annually increasing, and will therefore require a constantly increasing foreign supply. But it is doubly interesting at the present period, when every day renders it more clear and certain that our stock of native wheat at the close of the present harvest must of necessity be very far below the average; whilst, on the other hand, those of foreign growth, both here and on the continent, are also much lower than usual.

Before, however, I go into the statement of figures, it may not be deemed irrelevant to take a slight glance at the past history of the wheat trade, to show the rapid progress it has made the last thirty years. The British commerce in wheat is of very ancient date. That grain was introduced into England by the Romans at the time of the conquest; and during their occupation of the country, which extended over four hundred years, the cultivation of that cereal, as well as agriculture in general, was extensively and successfully prosecuted, so that large quantities of wheat were exported to the continent. But upon the Norman Conquest, and the introduction by that people of the feudal system, agriculture as rapidly declined; nor did any effectual revival of that branch of industry take place until the latter end of the fifteenth century, when it again became an object of attention both with the middle class and the gentry. In 1534 the first English treatise of any account on agriculture was published by Sir E. Fitzgerald, one of the judges of the Court of Common Pleas, which shows the degree to which that subject had engaged the attention of the higher class. This work is curious also, as conveying a good idea of the manners and condition of the rural population of that day.

In those early ages of our history the use of wheaten bread was almost exclusively confined to the upper ranks of society, whilst the working classes were fed on barley, rye, and oaten bread, as is the case in most of the countries of northern Europe at the present day. The farmers, too, were restrained by the covenants of their leases, as well as by legislative enactments, from growing more than a certain proportion of wheat, it being considered too exhausting a crop. And this unwise restriction was enforced by many leases, in some districts of England, until a very recent period. It is now, I believe, entirely banished from modern leases; and the laws by which it was enforced are either repealed or gone into desuetude.

Long after the time of the Tudors, England continued to be a wheat-exporting country, the small advance made in population being more than compensated for by the improved and extended cultivation of the land. It is a well-known fact, that during the entire even of the last century the increase of population was scarcely perceptible; and consumption and production went hand in hand, with a balance, upon an average of years, in favour of the latter: so that we exported more wheat than we imported.* The stimulus also given to agriculture by war at the close of the last and beginning of the present century enabled us in common years to meet the wants of the then rapidly increasing population, consequent upon the extension of our manufactures; until about the year 1825, which I have been led to consider the turning period, when

* It would be difficult to procure a regular series of statistics of that period; but, as an instance, I may state that in the five years from 1748 to 1752, inclusive, the exports of wheat were 3,219,804 qrs., whilst the imports were only 671 qrs.

the equality between consumption and production no longer existed, but an annual supply of foreign wheat became necessary.

From that period the stimulus given to consumption by the increasing population has never shown any symptoms of decline. The necessity for importation has certainly been greater or less, according to the abundance or otherwise of the home produce; but from the year I have mentioned there has never been a season in which foreign corn has not been imported largely and *used*, nor has there been in the most abundant years so great a surplus as to render unnecessary, in the following season, a foreign supply.

But it was the stimulus given to our manufactures by the measure of 1846 that produced the extraordinary increase in the consumption of wheat, as well as of every other kind of agricultural produce, we now witness; and which has rendered annually increasing supplies an absolute necessity, whatever may be the abundance of the home produce. Thus during the last four years we have imported upwards of twenty million quarters of wheat and wheaten flour, the whole of which has been consumed (with the exception of a small portion re-exported), although our own crops have been fully average ones. And the same cause must continue to operate with accelerating force now that the markets of Australia open an unlimited demand for British manufactures; so that the difficulty now is, not to find a sale, but how to furnish supplies of goods fast enough. I now proceed with the more immediate object of my letter, by showing the exporting power, in regard to wheat, of the various countries from whence we receive our supplies.

I shall commence with the first section named in my former letter, taking the northern ports of Russia, including Archangel, Petersburg, and Riga. Archangel lying on the shore of the White Sea, and the 65th deg. north latitude, is incapable of producing wheat, which cannot arrive at maturity above the 63rd degree; nor is the land in the immediate vicinity of Archangel of a quality capable of a bearing wheat. A considerable quantity, however, is brought down the rivers Dwina, Onega, and Mezene, during the short summers, and stored at Archangel. These rivers are all connected with the Wolga by canals, and wheat is thus brought by them as far as from Siberia. The quantity exported from Archangel in five years, from 1838 to 1842 inclusive, was 83,413 quarters, or an average of 16,683 quarters per annum.

Petersburg receives its supplies of wheat by the Neva and its tributaries, during the summer, and by land carriage during the winter. The quantity exported from thence is about 190,000 qrs. per annum.

Riga exported in 1847 about 70,000 qrs.; but the average exportation of twenty years from that port did not exceed 32,000 qrs. per annum.

Norway and Sweden, like Archangel, contains a thin poor soil, and an inhospitable climate; the greater part of these countries being incapable of growing wheat. In Norway, especially, the seasons are precarious; and there are three nights in August called "iron nights," on account of the blasting winds, which frequently destroy the crops. On these nights the farmers burn large ranges of fires on the windward side of their corn fields, to temper, in some degree, the severity of the atmosphere. Throughout Norway, the Government has established public granaries, to which the farmers may send their surplus produce, or receive loans of corn, if they stand in need of them. The depositors receive at the rate of 12½ per cent. of increase on their corn remaining twelve months; and the borrowers, on replacing the quantity advanced, pay 25 per cent. increase at the expiration of the same period, the difference of 12½ per cent. paying the expense of the establishment. Sweden is well cultivated, and wheat succeeds well, as high as 63 degrees north; but the quantity exported from both countries is very small, not exceeding, we believe, on an average, 5,000 qrs. per annum.*

Denmark, including the dependencies of the Duchies of Schleswick and Holstein, grows a considerable quantity of wheat, the chief part of which, however, is consumed by the rapidly increasing population, and Holstein supplies most of that portion which is exported. This is chiefly conveyed by land-carriage to Hamburg, a distance of forty or fifty miles, through bad roads, on account of freight, insurance, &c., being cheaper there than at the Baltic ports; besides the advantage of its port being open at all seasons of the year. Denmark proper exported, in five years, from 1844 to 1848 inclusive, 850,000 qrs. of wheat from the port of Copenhagen alone, or an average of 175,000 qrs. per annum. From other ports we estimate the quantity at 100,000 qrs. The landed proprietors in Denmark, as in most of the continental states, are small, and generally poor and embarrassed.

Dantzic, Konigsberg, Rostock, and Stettin, are the granaries for the produce of Prussia and its dependencies. The two first, the one on the right and the other on the left branch of the Vistula, receive the wheat and other produce brought down that river from Prussian Poland and the neighbouring districts; the wheat obtained from thence is mostly white, and of the finest quality. The Rostock and Stettin wheat are also excellent in general, but chiefly red. Dantzic shipped in seven years, from 1834 to 1840 inclusive, about two million qrs., or an average of 285,714 qrs. per annum. Konigsberg exports about 65,000 qrs. per annum, Rostock averages about 110,000, and Stettin about 250,000.

Hamburg is the depôt for corn brought down the Elbe from the Mecklenburg, Hanover, Western Prussia, Anhalt, Saxony, Bohemia, &c. All the wheat thus obtained is granaried in one bulk at Hamburg. Much of this, especially that from Mecklenburg, is very inferior in quality, which deteriorates the entire sample. The quantity exported in three years, from 1839 to 1841 inclusive, was 1,650,000 qrs., or 550,000 qrs. per annum.

Bremen receives the produce brought down the Upper Weser, but the greater part is consumed on the spot. Thus, out of 38,670 qrs. of wheat stored in three years, only 5,400 qrs. were exported.

From the Netherlands were exported in eight years, above the imports, 2,787,760 qrs. of wheat, or an average of 348,470 qrs. per annum. A good deal of this was not of the growth of the country, but imported and stored. As, however, it was the excess above the imports, it must be considered as native produce.

Northern Europe therefore stands as follows, in regard to the proximate quantity of wheat she is able to supply, and the actual importation into the United Kingdom:—

	Exporting power.	Exported to the United Kingdom. Averages.
	qrs.	qrs.
Northern Russia, including Archangel, Petersburg, and Riga ..	238,683	50,830
Sweden and Norway	6,000	2,280
Denmark, direct.....	275,000	190,908
Prussia, including Dantzic, Konigsberg, Rostock, and Stettin	716,000	716,145
Smaller ports	150,000	
Netherlands	348,000	466,689
Hamburg.....	550,000	380,824
Smaller ports, say.....	100,000	
	2,377,683	1,807,679

NOTE.—The exports to the United Kingdom are taken

* The peasantry of Sweden subsist very much upon rye-cakes, baked only twice in the year, and as hard as a board, like the ship-biscuit of our navy.

from the Parliamentary returns; and are the returns of 1849, 1850-1.

SECTION II.

France, like England, is both an importing and an exporting country in corn; but, upon the average of years, the former greatly preponderates. Thus, from 1816 to 1852, the aggregate excess of imports of wheat and flour above the exports was 21,218,102 hectolitres — equal to 7,293,722 qrs., the largest excess of export being in the five years from 1848 to 1852 inclusive, when it amounted to 4,189,423 qrs., or an average of 837,884 qrs. per annum. It is now, however, very evident that this grand start in the export of wheat and flour has not been entirely the result of increased production, but the temptation of higher prices than could have been obtained at home; and that she could not well afford it, is equally certain, for she is now compelled to repurchase at greatly advanced prices. Upon an average of years, therefore, France, like ourselves, must be an importing rather than an exporting country. Her imports of wheat and flour in 1846 and 1847 amounted to 4,708,738 qrs. of wheat, and 1,567,095 cwts. of flour; and it is more than probable that during the next season we shall have her as a competitor for the purchase of wheat in the other cereal districts of the world, and that if she is able to export any wheat or flour, it will only be the excess of her imports above what her own requirements demand.

Spain has, of late years, exported very little wheat or flour. We have received a small quantity of the latter in the present season, but it forms no criterion for the future. Some of the maritime districts of Spain are but ill supplied from the interior, on account of the bad state of the roads, and find it cheaper to purchase and import from America, when the price there is moderate, than to use the native-grown wheat.

Portugal also exports no wheat of any consideration. In that country, as well as Spain, agriculture is in its infancy—or dotage, we scarcely know which. At any rate, very little improvement has been made in the country generally, and recent laws passed there are likely to throw it back still further in social progress.

Sardinia, Tuscany, and the Papal territories export but little wheat, probably not more than the excess of imports from the Black Sea. In fact, the exportation of wheat or flour is frequently prohibited by law in the Italian states, and no estimate can be depended upon as to the quantity to be obtained from thence.

The Austrian territories have in general yielded a considerable quantity of wheat for exportation, but at present they are purchasers to a large extent at Trieste, their only port. The crop of wheat this year in Austria is stated to be a very deficient one; consequently she will have no native produce to dispose of.

From Sicily there has been an increasing exportation of wheat since the restriction was removed; but I understand that the prohibition has been renewed, and therefore no wheat will be obtained from thence this season.

Greece has begun to export wheat, some shipments having been made from Salonica, but the quantity is very small at present. The Greeks, however, are beginning to improve in agriculture, and their natural turn for commerce will enable them, before many years, to become wheat exporters.

From the Turkish province of Roumelia a considerable quantity of wheat is obtained. Adrianople is the depôt, whence it is shipped and brought down the Maritza in the Grecian Archipelago. I have no statements of the entire shipments from thence, but the quantity exported to the United Kingdom in 1852 was 27,650 qrs.

Constantinople exports a considerable quantity of wheat, but as she also imports largely from Odessa and other ports of the Black Sea, it is impossible to make even a proximate estimate of the quantity of native produce exported from thence. The stimulus given, however, to the trade of late years will probably cause the cultivation of wheat in Asiatic Turkey to be more attended to. Formerly the French imported largely of wheat from Smyrna and other parts of Asia Minor, and in some years drew 300 cargoes from thence; but the Turkish Government prohibited the trade, and, in fact, excluded all foreigners from passing the Dardanelles, and this prohibition continued for many years, but was rescinded towards the latter end of the last century. We imported from Syria in 1852 about 7,000 qrs., but the quantity is generally included in the aggregate shipments from all the ports of the Mediterranean and Black Seas.

Egypt furnishes a large and increasing export of wheat, of a much improved quality and condition. Formerly the grain from thence bore a very low value, compared with our own, the wheat being as much as 15s. per qr. below English wheat; but so much has it risen in the estimation of our millers, that at one time during last year it sold at only 5s. per qr. below it in the London market. What Egypt is likely to become in the hands of the present liberal and enlightened Pacha, it is impossible to say; but the exceedingly rich quality of the land in the valley of the Nile, the productive powers of which are now beginning to be developed, renders it probable that an increasingly large amount of produce may in future be looked for from thence. As a specimen of the increase, we may state that the importations of wheat from thence into the United Kingdom in the years 1849, 1850, and 1851 were respectively as follows: 128,273, 247,235, and 533,191 qrs.

Syria begins to export wheat, but the quantity is small. It is, however, a question of price; and should wheat advance much here, it would bring an increased quantity from thence. The exports from thence the last three years were 67,467 qrs., or 22,489 qrs. per annum.

From the southern shores of the Mediterranean no wheat is obtained: yet that grain is extensively cultivated in the Highlands of Upper Ethiopia, and could be brought by way of the Red Sea to the Mediterranean at a small expense. At present the produce is all consumed on the spot; but the cultivation could be greatly extended if encouragement was offered, and the quality of the wheat is far superior to any of the Mediterranean wheats, such perfection have the natives attained in its cultivation*.

Our second section will, therefore, exhibit the following relative and proximate statement:—

	Exporting power.	Exported to the United Kingdom. Average.
	qrs.	qrs.
France, except under the pressure of high prices	None.	1,025,537
Spain do.	Do.	—
Italy do.	Do.	118,583
Austria do.	Do.	94,373
Naples & Sicily, do.	Do.	—
Greece	30,000	21,784
Turkey, at the Mediterranean Ports	120,000	96.678
Syria	30,000	22,522
Egypt	550,000	302,877
	730,000	1,682,354

* "Within a circuit of five miles round Ankober twenty-four varieties of wheat, sixteen of barley, and two each of rye, oats, and maize, are distinctly recognized by the natives; being produced by hybridizing, and frequently changing their seed-corn."—*Harris's Highlands of Ethiopia.*

Section III.

The free port of Odessa, at the northern end of the Black Sea, first claims our attention. The supply of wheat at this port is one-third soft and two-thirds hard, and is brought in part down the rivers Dniester, Dnieper, and Bug; but a large proportion is also brought by land from Podolia, Volhynia, &c, in carts drawn by oxen, on account of the danger and difficulty of navigating the rivers. The quantity of wheat exported from Odessa in six years, from 1844 to 1849 inclusive, was 8,982,047 qrs., or an average of 1,488,457 qrs. per annum. The distribution of this immense quantity was as follows:—

	Qrs.
To the United Kingdom	2,228,821
Northern ports of Europe	369,652
Mediterranean ports, including Constantinople	6,383,574
	8,982,047*
Or, per annum:—	
United Kingdom	371,470
Northern Ports	61,608
Mediterranean do.	1,063,929
	1,448,457

In the two following years, 1851 and 1852, the quantity shipped was 2,320,901 qrs.; of which the United Kingdom received 1,041,024 qrs. The hard, or Ghirka, wheat of Odessa was formerly used chiefly in the Mediterranean countries for making vermicelli, macaroni, &c. Constantinople, the Greek Islands, the Asiatic Coast, Anatolia, Smyrna, Malta, Sicily, Tuscany, Genoa, Nice, &c., are all to a certain extent supplied with wheat from Odessa and other ports of the Black Sea. But of late this description of wheat has come into favour with the English millers, and is now used in making the best flour. Of the above import 453,700 qrs. were hard and Ghirka wheat.

Marianople, Taganrog, and Berdianski, all situated in the Sea of Azoff, receive their supplies of wheat from the country about 100 miles inland, beyond the sandy steppes which border the coast to that extent, and are incapable of bearing wheat. It would seem that the soil on which the Ghirka wheat grows is peculiarly adapted to that grain; for it is a singular fact, that it is perfectly free from any seeds of either weeds or corn. It is brought down the rivers Don and Donetz. In 1847 there were shipped from Taganrog 546,856 qrs., and from Marianople and Berdianski say 200,000 qrs.

A considerable quantity of fine wheat, the produce of the Crimea, is shipped at Tirtschi, at the eastern extremity of tha peninsula, the exact quantity of which, however, I have not been able to ascertain.

The Turkish ports of Galatz and Ibraila, the former in Bulgaria on the south, and the latter in Wallachia on the north bank of the Danube, and Varna, on the coast of the Black Sea, receive the immense produce of Moldavia, Wallachia, and Bulgaria. These fine principalities contain a deep, rich alluvial soil, and, with proper cultivation, are capable of supplying us with an ample quantity of cereal produce. If peace continue, there is no calculating what may be produced there. Formerly the wheat from thence was damp and earthy, from being stored in pits under ground. It is now, however, much better conditioned, and is rapidly getting into favour with the English millers.

In 1847, Galatz exported 180,860; Ibraila, 390,818; and Varna, 377,500 qrs. of wheat. The average export from Galatz in ten years, from 1840 to 1849, was 151,467 qrs. per annum. The Moldavian wheat is chiefly hard, but the Wallachian and Bulgarian is soft.

Shipments of wheat have begun to be made from the southern and eastern shore or Asiatic side of the Black Sea, and a small supply may be obtained from thence, but no estimate can be formed of the quantity.

Our third section therefore will provide as follows:—

Exporting power—	qrs.	Exported to the United Kingdom—	average qrs.
Odessa	1,488,457	Black Sea (Russia)	484,348
Taganrog	546,856	Ditto (Turkey)	281,381
Marianople and Berdianski—say,	200,000		
Galatz	151,467		
Ibraila	390,818		
Varna	377,500		
	3,155,090		765,729

Section IV.

I am now come to the New World, the boundless resources of which might lead us to expect a corresponding extent of supply; this, however, is not the case. From an account before me of the produce of each of the States of the American Union, I find the aggregate quantity of Wheat produced in 1840 was only 9,373,343 qrs.; that the quantity exported in twelve years, from 1830 to 1841, inclusive, was 3,471,276 qrs. of wheat, and 11,968,147 brls. of flour, which, reckoning the latter at two, to one of the former, makes an aggregate of 9,455,349 qrs., or an average of 787,945½ qrs. per ann.; and that in the previous nineteen years the exports were 1,610,638 qrs. of wheat and 19,173,867 brls. of flour, or an aggregate of 11,197,571 qrs., which allows an average of 589,345 qrs. per annum. During the last three years the quantity exported did not exceed 2,400,000 qrs*.

In British North America the export of wheat and flour is gradually increasing. In the ten years from 1838 to 1847 inclusive, there were exported from Canada 362,222 qrs. of wheat and 3,348,526 brls. of flour—making an aggregate of 2,036,485 qrs., or an average of 203,648 qrs. per annum. Since 1847 the quantity exported from Canada has much increased, and in 1852 she exported 687,089 qrs., which is almost as much as was exported from the States. Little or no wheat or flour is exported from New Brunswick and Nova Scotia. The importations from British North America into the United Kingdom in the three years, from 1849 to 1851 inclusive, were 351,340 qrs., or 117,113 qrs. per annum.

The exporting power of the American continent in wheat may therefore be reckoned as follows:—

	Exporting power. qrs.		Exported to the United Kingdom. Average qrs.
United States—say,	10,00,000	.....	484,348
British North America	600,000	.....	117,113
	1,600,000	.....	601,461
Summary.			
Section 1	2,377,683	.....	1,807,679
Section 2	730,000	.....	1,682,354
Section 3	3,155,090	.....	765,729
Section 4	1,600,000	.....	601,461
Sundry places not included in the above	50,000	.....	38,931
	7,912,773	.....	4,896,154

* In 1847 alone the export of wheat from Odessa was 2,016,692 qrs.

* The following table will show the small progress the cul-

In reference to some of the items in Section 2nd, it is necessary to explain why they have been filled up with blanks. With regard to France it is not likely that she will have any native produce to export *this year*, to which alone my letter has reference. Whatever wheat therefore she exports must be subtracted from the exporting power of other countries, *obtained in excess of her own consumption*. The same also may be said of Austria and the Italian States. Naples and Sicily can export none—it being prohibited. Spain stands in a different position, and under the pressure of high prices would export considerably; but I can make no estimate upon such a contingency.

Sections 1 and 4 cannot much increase their exports, for such is the approximation of consumption towards production that any pressure upon their stocks in consequence of high prices here would at once raise *their* prices at home on a par with us, and put a stop to it.

It is therefore on Section 3 alone that we can depend for an increase of exports for the coming year, much beyond the average of past years; and the boundless extent of the Russian and Turkish provinces on the north and west of the Black Sea affords us the satisfactory assurance that until we are shut out of that sea by a war, we shall never want an abundant supply of wheat.

I am, Sir, yours, &c.,

S. C.

London, August 17th.

tivation of wheat has made in the United States beyond the wants of the population:—

	Average export of flour.	
1800 to 1809	923,402	brl.
1810 — 1819	1,011,949	„
1820 — 1829	904,091	„
1830 — 1834	1,137,550	„
1835 — 1844	955,331	„
	5) 4,934,323	„
Average	986,864	„
Or	493,432	qrs.

ROYAL BUCKS AGRICULTURAL ASSOCIATION.

An agricultural meeting would appear necessarily to furnish a fine source for ridicule and contemptuous allusion. No man who ventures to express his opinions on such an occasion but who feels, while he is doing so, that he is certain to have his best intentions misconstrued, and the object of his labours derided and retarded. Enough let it be that he has in any way identified himself with the farmer's interests, and he must be wrong. Had he been doing as much for tradesmen or manufacturers, his efforts might have exalted him into a hero, and his orations into an oracle. His great aim, however, is unhappily to pay his first dues to those with whom he is more immediately identified; the prosperity of the working-farmer and of the working man consequently becomes his chief care. To their condition he devotes his talents; to their feelings he directs his eloquence; and with this one foregone conclusion, that gross abuse will follow every word he utters, and systematic opposition every step he advises.

One might have imagined there was some promise of the autumn gatherings of the present year going off with far more than usual good feeling, and unanimity. Instead of creating division, indeed, such assemblies might now be expected to bring the different classes of society more and more together. It was not thought likely that any of the speakers would touch upon unpalatable themes. There was hardly an opportunity for their doing so; and we are happy to record that so far they have in no instance attempted it. Perhaps the most dangerous ground we have yet been over was in following Sir Fitzroy Kelly at the Ipswich Meeting a few days back. The learned gentleman seemed scarcely inclined to admit that it was just one certain line of policy which had done everything for us—that had made bread cheap and labour high; that had discovered the gold fields in Australia; and rendered Great Britain so unprecedentedly prosperous as to lead to as unprecedented an emigration out of it! Sir Fitzroy rather went with the venerable Sam Slick, who, at the Gloucester Meeting touched so quietly and (as usual) so 'cutely on "politicians who claimed to themselves the merit of all this." Surely those upon whom the weight of the trial fell might have some little claim of their own; and the county member did his constituents but justice when he put it thus for them at the Suffolk show—it will fit a kingdom almost as well as a county:—

"He (Sir Fitzroy Kelly) was well aware that, upon these festive occasions, there was an honest and a salutary rule, from which he should be the last to depart, to avoid all allusion, at least which could be avoided, to political subjects, upon which, in this free country, it was impossible but that there must be great and serious differences of opinion. He would endeavour to conform to that rule in the few words which he should now address to them; for at least he should presume, consistently with that justice which he owed to all within that hall, to make some allusion to the changes lately effected in the state of agriculture. It would be in vain to deny, whatever might be the cause—and he would not expressly allude to that cause—it would be in vain to deny that when they last met, the farmers of this county, and indeed the farmers of all England, were suffering severely under a depression, from which he rejoiced to feel that they had partially arisen, and that the sun of prosperity was beginning to shine upon their efforts to right themselves. Now that that change had been undergone; now that we all saw that something had transpired—from whatever cause that happy change had arisen—to place them in a better position in the scale of society; now that they saw the result of their efforts to support themselves in

the pursuits in which they were engaged, and that they had some chance of realizing their expectations, it became them all to consider a little what were the causes which had led to this appearance of prosperity. Now it was in vain to deny that some of the causes were such as might be considered beyond human control. Undoubtedly it was rather by a dispensation of Providence than by the efforts of men that, at a time when the effect of legislation was almost to prostrate them in the dust, to deprive them of all hopes of maintaining that position in society which the great interest entrusted to their hands entitled them to hold—it was in vain to deny, he said, that it was by that dispensation of Providence, the influx of gold into this country, its effect upon the circulation, and its effect upon the prices, aided perhaps in some measure by the great tide of emigration which had rolled away from this kingdom—it was in vain to deny it was by these that the unhappy depression to which they had been reduced, had, to say the least, been partly removed. But it was with feelings of proud satisfaction that they might all be conscious that it was not only to the dispensation of Providence to which he had alluded, but that to their own great and untiring efforts they owed the relief which they had experienced. It was impossible not to see, assembled as they were upon an occasion like the present, when all that industry, all that perseverance, all that the power of man could do to improve the state of society in which they were placed, had been done by the farmers of this county, as evidenced by the magnificent display which had been made—it was impossible not to see that it was in a great measure to their own efforts that they owed the relief which had been extended to them, and which had placed them in a so much happier and prouder position."

Of course the critic caught at such bold speaking as this; but he could do little with it, and Sir Fitzroy Kelly's testimony remains, as it must remain, an unimpeachable tribute to the courage and perseverance with which the English farmer bore himself through a trial, that tried him and none else.

The Suffolk has been succeeded by the meeting of the Buckinghamshire Society at Aylesbury—an anniversary that for the last few seasons has been rendered more than commonly remarkable by the presence of a very remarkable man. He was present on this occasion; and though we will believe he never intended better, we find he never offended worse. Compared with the honourable member for East Suffolk, Mr. Disraeli was discretion itself. He denounced the slightest attempt at political allusion or inference; he denied that the principles which brought himself and his constituents there together had ever in any way been dependent on "the transitory passions of the hour." He would let the society have no standing and no character, but as strictly as that it was termed —an" Agricultural Association." He attributed the continued existence of the Society to the observance of these principles, and in defining them he placed this as the first amongst them—"that which acknowledges there is a sympathy of sentiment and an identity of interest between the employer and the employed." One might suppose it would be rather difficult, if not imprudent, to attempt to deny or to weaken so desirable a union. Mr. Disraeli's only offence, however, has been in acting up to it. He himself has offered and presented testimonials in appreciation of the conduct of the labouring man. He has held him up to his fellows as an example of how honesty and industry may elevate a man in any sphere of life, let it be ever so humble. He has given honour where honour has been due, and presented the public thanks to the good citizen. And for so doing—the man who has dared to offer, and the one who has deigned to accept such a tribute, have been jeered at quite in the spirit and almost in the words with which the village vagabond, hopeless himself of ever attaining such a distinction, would wish to regard it: "Here's a fine reward for forty years' hard work"—"Here's a smart coat to fit an honest man"—"Here's propriety of conduct, and what's paid for it. Why, I could make more in a week by snaring pheasants or selling bad beer than you have got by this in all your lifetime." One of these critics, and his position is a high one, distinctly tells the agricultural labourer that it is a disgrace for him to receive such a reward as that the Buckinghamshire Association offers him; that his forty years of honest industry are simply an absurdity, and that he could do much better "by a profitable traffic in bad spirits," or by "*sending up pheasants to Newgate market!*" Our only wonder is, that the personal and national advantages of incendiarism were not as warmly dwelt on, or the many attractive features in the commendable art of sheep-stealing as pointedly referred to. Happy employed! and yet more happy employer! When the labourer is in the Union or the prison-house, whose fault is it but the farmer's? When he is honest and independent, and yet encouraged to continue so, whom have we here to blame again? It is the farmer still, who offers testimonials to honest industry, and dares appreciate the conduct of an upright man.

The best reply to this worse than nonsense will be found in Mr. Disraeli's speech, which we give in another column. He anticipated the attack, knowing as he did how sure it was to be made on any one who advocated the objects of an agricultural association. We believe with him "that societies like the present have a tendency to elevate the condition, because they elevate the feelings, of the labouring classes;" and we only hope that criticism (such as that we have had to refer to) will ever have as little weight with the employed as it can but have with his employer. Its only possible aim or effect is to encourage indifference on the one part, and immorality on the other.

The annual meeting of this society was held on Wednesday, Sept. 14, at Aylesbury, and the members and friends of the association afterwards dined together at the George Hotel. There was a very large gathering—the large and two smaller rooms being densely crowded. Among the gentlemen present were —Mr. Lownes, the president of the day, Mr. Du Pré, M.P., the Right Hon. B. Disraeli, Mr. Bernard, Mr. John Hall, the Rev. Mr. Young, Capt. Robarts, and several other gentlemen connected with the county. The gallery of the large room was filled with ladies, attracted no doubt by the report that Mr. Disraeli was to be present. The chair was taken by Mr. William Lownes, of Chesham, on whose right and left sat the members for the county, Mr. Du Pré, and the Right Hon. B. Disraeli.

After the usual loyal toasts,

Mr. Du Pre gave "The Health of the President of the day—Mr. William Lownes." (Hear, hear.) The president was always to be found at his post when required, and he hoped he would long have health to perform his duties. (Hear, hear).

The Chairman returned thanks, and regretted that there was not a larger number of farmers present (although he must say the room looked as full as it could hold), but he was aware that many of them were engaged at home carrying their corn. The farmers had had serious times to contend with during the last twelve months, owing to the wet, and he knew their hay had suffered; but he hoped this fine weather would enable them to get in their corn, and that when it was thrashed, it would turn out better than they expected. The wheat crop throughout the county was scarce, in consequence of the small quantity of grain put into the ground, owing to the prevalence of wet weather. The other crops, however, were doing very well, and he was happy to say that he had himself some as good as any of his neighbours. (Hear.)

Mr. Bernard proposed "Prosperity to the Royal Bucks Agricultural Society." He was happy to be able to congratulate the members upon the prosperity of agriculture generally —a prosperity which they knew to be co-existent with the prosperity of all other classes in the country. This was a subject of considerable gratification to all who, like the farmers, were interested in the general prosperity of the people.

The successful candidates, including shepherds, ploughmen, farm-labourers, and others, were then introduced, and a sum of money was distributed to them by the chairman.

The Chairman addressed a few words of congratulation and encouragement to each candidate, after which they retired, apparently much gratified with the decision of the judges.

The Chairman observed that the next toast in order on the paper was the healths of the county members, Mr. Du Pré and the Right Hon. Mr. Disraeli (loud cheers). He considered the society was much indebted to Mr. Du Pré and to Mr. Disraeli not so much for their attendance that day, or for the interest they had shown for the society, but for their services as members of Parliament (cheers). There was no occasion upon which either of those hon. gentlemen had ever been absent from their Parliamentary duties when their attendance was necessary. He need scarcely say that to Mr. Disraeli they all felt gratitude and admiration for his exertions and talents in Parliament; and in the hope that he and his hon. colleague might long have health and happiness, he begged to propose the county members (loud cheers).

Mr. Du Pre said, it gave him sincere pleasure, in this eventful year, to be able to meet the members of a society which deserved such warm encouragement and support, and to see around him the faces of many well-known friends, for whom he entertained the most sincere respect and affection (Hear, hear). Having said thus much, he was bound to confess that he did not think he ought to enter on any lengthened discussion. It was a wise rule that the principal topics of party warfare were excluded from their meetings; and, although in former times they had discussed all matters relating to agriculture generally, it was far better that subjects of a political tendency should be omitted on such occasions. He had been for many years a member of that society; and although he had never had the opportunity to indulge in the healthful and delightful occupation of cultivating the soil, yet he hoped he would one day be able to do so. But, not having had any practical experience, he felt that it would be presumptuous in him to make observations upon any topic of that nature to persons who were so much more competent to speak upon them than he was. He could not, however, refrain from congratulating them that, among the changes of the past few years, the prosperity of the society had been undiminished. Its friends were as cordial and as numerous as ever, and its funds continued to be well supported; and what they had seen that day gave them reason to hope that the society would continue to do good and flourish (Hear, hear). Nevertheless, he was bound in candour to confess that, since they last met in that room, things had not gone on so well as they had anticipated. He had given his cordial support to those whom he believed to have acted in the best spirit for the interest of the country (Hear). Their measures were introduced in no party or factious spirit. He believed they were not retrograde, but had been framed with a view to the spirit and necessities of the age (Hear, hear). After what had been passed, it would be wrong for him to say that he would give his unqualified adhesion to any party (Hear, hear). But this he could say, that any measures for the benefit of agriculture would meet his support, come from what quarter they might (Hear, hear). He hoped that the prosperity which agriculture at present enjoyed would not be of a temporary nature, but that it would take deep root in the country, and be productive of advantage to all classes of the community (Hear, hear).

Mr. Disraeli then rose to return thanks. The right hon. gentleman was enthusiastically cheered, and remained standing for some time before order was restored. He then said: Mr. President and Gentlemen,—The relations between us are so intimate, that it is unnecessary for me to say that I must always appreciate in the spirit it deserves the high honour which you have conferred upon Mr. Du Pré and myself by drinking our healths. I have had the honour, for some years, to act with Mr. Du Pré in the House of Commons, and without referring to the political subjects which my hon. colleague has told you are very properly omitted from our discussions, I can truly say that, in all questions in which your local interests were concerned, I have ever found him a wise counsellor and an earnest and able supporter (Hear, hear). With regard to the society which has brought us together today, I confess I have ever felt an interest in it, which the circumstances of the case have, I think, justified. I had the honour of being present at its first meeting, and I have now the pleasure to hear its majority announced and toasted by the Colonel of the Buckinghamshire Yeomanry—a very proper person to introduce such a subject to your notice (Hear, hear). This is a society the object of which was much less ambitious originally than many others which have not lasted so long; and there has been no society of the kind, the purposes and objects of which have been more misrepresented and maligned than the present. It has been the interest of many persons to denounce this society as a political machine; and I may say that, during the 21 years it has been in exist-

ence, its conduct has been such as to show that the accusations made against it had no foundation in fact; and at this moment, when there is no question of immediate urgency affecting the interests with which it is connected, the society has remained in existence; and we find, by this well attended assembly, that the principle which has always brought us together has been deep and sincere, and that it has been perfectly independent of the transient passions of the hour (Hear, hear, and cheers). Those who are now assembled perfectly justify the character which they claim for the society, and account for the interest which those who are connected with the county must ever feel for it (Hear, hear). I remember when the rewards which we offered were ridiculed. It is true they were humble, but they were rewards which gratified the humble (Hear, hear). They are not offered to those who have received them with heartfelt delight as rewards, but as symbols that we respect the virtuous (Hear, and cheers). And when it is said that a man may serve forty years, and at the end of that time receive a reward of merely the same number of shillings, they who pass such comments show a profound ignorance of the feelings of the peasantry of this country, and of the motives which induce them to exertion (loud applause). Once admit into the consideration of this question that pounds shillings and pence are to govern all the motives which influence human life, and I should like to know how many anomalies you might point out, and how many examples you might hold up to ridicule (Hear, hear). But that is because you would choose to adopt the lowest test for what we esteem the highest conduct. (Applause). But it is unnecessary for me to make any remarks on this point, for the best refutation of all such charges is the feeling exhibited by the labouring classes. When assembled as you have seen them this day, they receive those rewards out of those means which you have at your disposal, and in the manner which you adopt here in bestowing those rewards. I have not the least hesitation in saying that this society—limited though its influence may be—has, during the term of its existence, exercised a most beneficial effect on, and has held out many inducements to, the labouring classes of this country, by whom it is looked up to with considerable interest, and with an estimate far different from that formed by those who pass critical remarks on a matter in which they are but indifferent judges. There is not a single shepherd, or ploughman, or dairymaid, who enters this room to receive these public rewards, who does not fully comprehend that they are offered as the consequence of moral conduct, and does not measure them by the amount—though that is not despicable—but they regard them as the rewards of their skill and assiduity. We find that those who by their good conduct have merited the uniform of the society, go to church in that uniform with the same pride, and the same rational pride, which a nobleman feels who goes to Court decked with his blue ribbon, if he have merited that badge of distinction (applause). The principle which dictates the reward is the same, and why should we not give to them the credit of being influenced by the same feelings? My own convictions are—and I have ever entertained the same opinion—that this society has a tendency to elevate the condition, because it elevates the feelings, of the labouring classes. No doubt the society might do more, but it is a great thing to do even some good continuously during 21 years (Hear). Many societies have started with very much greater and more commendable efforts, and with much greater promises, but have died within five, or sometimes three, years. And when we see that a society, which has existed for 21 years under all imaginable circumstances, can bring together so large an assemblage for so pure, so honest, and so honourable a purpose as that which has brought you together this evening, then do I see reason in this to congratulate you on the success which has attended your efforts, and on the progress which your association has made. This may be the foundation of greater efforts, and may lead to more extended results in accomplishing that great object—ameliorating the condition of the working classes; but I have no doubt that the principle which you enunciated one-and-twenty years ago is the sound principle, and that the results which have accrued from this society have been most satisfactory, and have exercised a most beneficial effect in elevating the feelings and the position of the labouring classes in the county of Buckingham. It is a subject ever of considerable interest, and at no time greater than at the present, that great changes are taking place, and that the tendency of these changes appears to exercise a great influence on the condition of the labouring classes. For example, if it be probable that an elevation of the labouring classes may occur—on which point I will not now pass any opinion, for it is an intricate subject, and one which gives rise to considerable controversy—it will be something for us that we have shown a sympathy with the labouring classes, and that we have prepared them for those changes which are taking place (loud applause). Here is the machinery to show that we recognize their claims—(Hear, hear)—the respectability of their position, and to prove that they are rendered, by their meritorious conduct, worthy of the sympathy of the community. In an age of change like the present, no one can tell what may be the future position of those classes on whose behalf we are to-day more immediately interested. How can we know what may be the condition of the ploughman in a few years? I am informed by a gentleman of considerable authority, and whose opinion is entitled to great weight, that in a few years the plough will be entirely superseded. It was in all ages, and in all times, and under all changes, ever considered safe to say, "Speed the plough!" but now I much fear that if in future we use that familiar phrase of "Speed the plough," we should be reckoned almost as old-fashioned as those who would cry, "Success to a jarvey!" (laughter.) But whatever may be the changes in our material affairs, let there be none in our moral proceedings; and though the plough may be superseded, the community will respect the virtues of those that show them, and will ever be ready to reward their good qualities, if they prove they are entitled to our respect and to those rewards (applause). I am happy to see that the right principle has ever regulated the actions of this society. What is the principle? Sympathy of sentiment, and identity of interests between the employer and the employed. That is the sympathy we ought to consecrate, and to take every opportunity to show that it influences our actions. With it, we may be prepared for all changes—and the wildest changes—and look forward to those changes without apprehension, for we should all be members of a society founded on principles of public virtue, and between all classes of men the principle of good feeling which should regulate our conduct would prevail (applause). I again find myself near my excellent friend the Chairman, as your guest—if I may call myself a guest, who am a member of your society. There were few occasions on which I was not present at your annual meetings; and when I have been unable to attend, my absence has been accounted for by reasons which were considered valid. I need not say that I ever feel a pleasure in meeting you all as I do to-day. I need scarcely assure you that, so long as I continue your member, I shall ever be happy, by every means in my power, to promote the welfare of a society, the general effect of which has been so beneficial to the county of Buckingham.

The right hon. gentleman resumed his seat amidst loud and long-continued applause.

The PRESIDENT then gave "The Healths of Mr. T. T. Bernard, Mr. John Hale, Captain Roharts, and the Country Gentlemen who support the association" (Hear, hear).

Mr. BERNARD acknowledged the compliment.

The CHAIRMAN said the next toast on his list was "The Healths of Mr. Lovitt and Mr. Howard, the Treasurer and Secretary of the Association.

Mr. LOVITT, in returning thanks, expressed a hope that the society and the country would not forget the Parliamentary services of Mr. Du Pré and Mr. Disraeli. Many and many a night in the eventful session of 1846 had they been kept hard at work, fighting the battle of the farmers (Hear, hear). He believed that no agricultural county would ever flourish under the system of free trade, nor did he think it could be established generally with advantage to the public until foreign countries were induced to follow our example, which they did not appear disposed to do at present. He did not like the idea of being dependent upon a foreign country for our supply of food, nor did he like to make advances in a free trade policy which were not reciprocated.

Mr. HOWARD thanked the assembly for having done him the honour to drink his health. He was glad to say that the society was in a most prosperous condition, and he had no doubt it would continue so. The present was also a prosperous epoch for agriculture, and he saw no reason for thinking they would soon see a diminution of it (Hear, hear).

The remaining toasts were—"The Committee," "The Judges of the Day," "The Stewards and the Vice-President," all of which were duly honoured.

IMPORTANCE OF GORSE FOR THE PURPOSE OF FATTENING STOCK AND ECONOMICALLY FEEDING MILCH COWS.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—The consumption of gorse by milch cows, horses sheep, and even cattle put up to fatten, is very much on the increase; yet little or no attention has been paid in many parts of the United Kingdom to its advantageous use as a substitute for many kinds of much more costly food for these purposes, few persons being aware of its nutritious properties, although, were its value more fully known, it would at once become the staple food for stall beasts, who fatten more rapidly on it than on other food. One great barrier, however, to its general use has hitherto been the difficulty of reducing it to a harmless pulp; and as the manufacturers have not as yet brought out a cheap and efficient machine, adapted to hand labour for this purpose as a remedy, allow me to inform you, for the benefit of your agricultural readers, that the most effective, simple, expeditious, and inexpensive method of performing this operation is by a chaff-machine, which will cut it into lengths not exceeding an eighth of an inch, which is sufficient if the gorse be young; but if not, pass it, in its already cut state, through an ordinary corn crusher, and it may then be safely given as food to cows, who will at once yield more milk, of a richer kind and more analogous to cream; and to horses, whose coats will in a few days become more sleek and glossy, and the animals themselves rapidly improve. And as gorse is found in great quantities in many parts of England, Ireland and Wales, and is generally cut for fuel, when it could be used with great profit as food for cattle, allow me to request the favour of a place for the insertion of this in the valuable columns of your next issue.

I am, sir, your most obedient servant,

JOHN BEWLEY.

Trafford-buildings, Liverpool, August 17, 1853.

GORSE AS FOOD FOR STOCK.

SIR,—My attention has been called to a notice in your paper of the 29th inst., headed, "Importance of Gorse for the Purpose of fattening Stock, &c., &c." In reference to your correspondent's mode of reducing gorse or whins, I can testify most fully to the power of converting that hitherto-intractable fodder into the finest possible condition for feeding stock. I have consumed the produce of between two and three acres of the growth of one year (nearly 20 tons), and all my stock eat it with avidity. I have further to remark that the machine and mill for the proper system of carrying out this preparation was supplied to me by Richmond and Chandler, of Liverpool (but made by them at Manchester). Mr. Garnett, of Bleasdale Tower, is just now adopting the same plan.

I am, Sir, your most obedient servant,

ANTHONY WILLIAMS.

Ludworth, Lancaster, Aug. 31.

—Mark Lane Express.

GORSE AS FOOD FOR STOCK.

SIR,—In a late number of your Journal I read an article on Gorse, or Whins, as being an excellent food for horses and cattle; the following extract from the *Edinburgh Gazette*, published 150 years ago, showing that the value of gorse was well known then to the farmers of Fifeshire, may be worthy of insertion. I am, sir, yours respectfully,

Whitchurch, Salop. JOHN BROWN.

"From Fife we are credibly informed, that these several months past they have made use of whins for food to their horses and black cattle, which they prepare thus:—First, having cut them as near the root as possible, for their better stowing into carts or sleides; after they have brought them home, they cut off the green tops with an axe, upon a block, then thresh them well with flails, and sift the sand and dust from them with a wide riddle. Upon this their beasts feed more greedily, and become more fat and hearty, than upon straw or hay; yea, they are able to work upon it without corn, or any other food, and many countrymen there have fed their work-horses there with aleuneriy several months. Considering the present circumstances the country is in, we thought the publishing thereof may be profitable to many."—*Edinburgh Gazette*, March 10, 1699.

ON THE DISEASE IN THE FOOT OF THE SHEEP—CALLED FOOT-ROT.

TO THE EDITOR OF THE MARK-LANE EXPRESS.

SIR,—This disease is undoubtedly now among sheep, and first appeared about the year 1842. It is confounded with the foot-rot, but it is more violent and difficult to cure. Its attack is also widely different in character as it suddenly attacks the largest portion of the flock simultaneously, and not gradually one by one, as was the case formerly with foot-rot, which usually first attacked the sole of the foot; but this disease more frequently breaks out at the top of the hoof or between the division of it. During wet weather it is extremely difficult to cure, and which can only be effected by great perseverance and the removal of the sheep to a dry floor until the foot is healed and the hoof hardened. The floor should be kept cleanly swept, and dusted over with fresh-slacked lime every morning; and the foot dressed with a solution of verdigris in verjuice, cutting the diseased parts clean away. Every sheep, as it becomes lame, should be removed from the flock, and not returned until cured.

I have for the last ten years at various times been troubled with this complaint amongst my sheep, which has given me great trouble and caused great expense to cure. Some persons decidedly succeed better than myself in curing it. A person known to me undertakes flocks at one shilling per head upon the whole flock,

and, as I have learned, makes the cure certain; but, as I think the charge is exorbitant, I do not employ him. And my object in writing now is to elicit information from any of your correspondents who may be in possession of the secret, or who may have any method whereby they succeed in speedily and certainly curing it. I need hardly say, that not only myself, but numerous other correspondents, will be also greatly obliged by any information on the subject.

I remain, sir, your obedient servant,

Writtle, Essex, Aug. 18. R. BAKER.

FOOT-LAMENESS IN SHEEP.

SIR,—I was glad to see Mr. Baker's letter in your last week's paper on this subject, which is a serious disease, not only to the growers of sheep, but to the consumers of mutton; for when this disease attacks a flock, it reduces their condition very much. I hardly know a flock in my neighbourhood that have not suffered more or less from it; and many have it now raging very badly.

I think it is a subject worthy the attention of the Council of the Royal Agricultural Society, to offer some premium for the best treatise upon the disease and its cure.

I have had several hundred sheep lame with it this summer—some of them fat sheep—which have wasted quite a stone (14lb.) in weight. I have used an ointment of the following composition:

1 oz. butter of antimony,
$0\frac{1}{2}$ oz. stone supplement,
$0\frac{1}{2}$ oz. blue vitriol,
$0\frac{1}{2}$ oz. verdigris,
2 drachms spirits of salts;

First having carefully pared the foot, and then applied this ointment, holding the foot up until it has been absorbed, and afterwards keeping the sheep on dry straw an hour, before letting them on to layers or pastures.

If any gentleman, having had the misfortune to have the disease in his flock, can give me a better recipe, I shall be much obliged. Your obedient servant,

A SUFFOLK FARMER.

FOOT-ROT IN SHEEP.

SIR,—I, in common with Mr. R. Baker, of Writtle, and many others, suffered severely from that disease, foot-rot in sheep; not foot-rot of old standing, occurring at the end of summer and autumn, principally in rich fattening pastures, but foot disease from the effects of murrain—and a lasting one it is, too—in the breed of sheep called *Sussex downs*, which, though otherwise possessed of good constitutions, yield quickly to the murrain in feet: for which cause I laid off a flock of pure Sussex downs, and have crossed them with others more suitable to our Scotch climate. I tried every preparation my scientific friends could suggest, when a Lammermoor neighbour called one day. I told my dreary tale of foot-rot. He immediately said he thought he had found a cure for it—TAR and SALT. I tried it, and found it to answer much better than any other application I had ever used. I added, however, a little finely-powdered blue vitriol, and have now got quit of the disease altogether. I had many varieties of sheep, but the DOWNS caught the disease first, and retained it the longest. A MOORLAND FARMER.

Berwickshire, September 1.

EXTRAORDINARY SALE OF CATTLE, &c.

[We direct the attention of our readers to the following table of the cost prices of stock sold in this country, with the profits on their re-sale in Kentucky, U.S. High as these prices are, it is but right to explain, that they can scarcely be considered altogether *bona fide*, the purchasers, for the most part, having been shareholders in the importation. These animals here sold constituted, with Mr. Alexander's, part of the cargo of the ship "Crown," as mentioned in the *Mark Lane Express* in June last.]

The Northern Kentucky Importing Association of Breeders had an auction sale of their pure-blooded short-horned stock (purchased in England in 1853), at the farm of Brutus Clay, of Bourbon county, Kentucky, on the 18th of August, 1853. The association is a Kentucky one, and the purchasers were put under obligations not to remove the stock from the state for one year; with this limitation the sale was well attended, and the bidding spirited.

Name.	Colour.	When Calved.	Cost in England	Sold for	Profit.
BULLS.			Dols	Dols.	Dols.
Young Chilton	White	May 1850	600	3005	2405
Diamond	Roan	June 1850	630	6001	5371
The Count.....	Roan	July 1851	525	2515	1990
Orontes	R. & W	Sept. 1852	630	4525	3895
Fusileer	Roan	Feb. 1853	375	4475	4100
Senator	White	April 1852	630	2000	1370
Belleville	Roan	Jan. 185.	1050	1500	450
Challenger.....	Roan	Jan. 1852	450	4858	4108
Fortunatus	Roan	Dec. 185.	275	1800	1525
Yorkshire Maynard	D. Roan	March1852	475	1000	725
COWS AND HEIFERS.					
Lady Stannope...	Roan	In 1847	375	1500	1125
Lady Fairy	Red	June 1848	525	1150	625
Roan Duchess ..	R an	July 1850	275	900	625
Goodness	Red	Sept. 1847	525	2025	1500
Gem	Roan	April 1851	775	825	50
Equity	Dp. Red	March1852	400	1000	600
Necklace (twins)..	Roan	April 1852	260	805	545
Bracelet (twins)..	Roan	April 1852	260	750	490
Mazurka.....	D. Roan	Aug. 1851	600	3050	2450
Lady Caroline	L. Roan	July 1851	400	1825	1425
Duchess of Sutherland.....	Red	Dec. 1850	375	900	525
Maid of Melrose ..	Rh.Roan	Oct. 1851	775	2200	1425
Muffin.....	R.Roan	June 1852	225	535	310
Orphan Nell	Roan	Nov. 1852	375	1 00	675
Flattery	White	Nov. 1851	325	805	480

SHEEP.

SOUTHDOWN.—Three bucks sold for 755, 480, and 340 dols.; and three ewes for 250, 180, and 230 dols.

COTSWOLD.—Two bucks sold for 1,010 and 710 dols.; and six ewes for 270, 150, 221, 230 200, and 150 dols.

LEICESTER.—One buck and two ewes sold for 52 dols. each.

HORSES.

CLEVELAND.—Bay horse (Young Lord), cost 1,900 dols., sold for 2,800 dols.—*Cincinnati Gazette.*

CALENDAR OF AGRICULTURE.

The sowing of wheat will be finished this month. The water-furrows, cuts, and ditches being cleaned out by the spade, the sown fields are shut up for winter with fences and gates in proper repair.

Prepare by fallowing the lands intended to be sown with early green crops.

Raise potatoes, in dry weather, by the plough or by the hand-fork; pull and carry the haulm to the dung-yards. Carry the potatoes to a dry place; form the heaps longitudinally, and about four feet high; cover with turf and earth, and thatch with straw. Secure mangel-wurzel, carrots, and parsnips in a similar way; and remove from clayey loams the crops of rutabaga, to make way for the land being sown with wheat. Give the tops of Swedish turnips and beetroot to cattle and sheep moderately at one time, in order to prevent hoving. Plant potatoes with farm-yard dung on fallowed lands;

drill widely and deeply, to preserve the sets from frost.

Put rams to ewes, 1 to 50, and place each lot in a separate field. Give them turnip tops and of beetroot, which will much promote the salacity. All aged, and unsightly, and ill-shaped animals, and bad thrivers, and those ewes that missed lambs last year, must be rejected for the purpose of breeding, and supply their places with the same number drawn from the ewe lambs that are now 18 months old. Much care and discrimination must be exercised in assorting qualities for the purpose of propagation. Mark the rams on the brisket with red paint or black pigment, which will mark the ewes on the rump, and enable the shepherd to put marks on the ewes regularly, as they are impregnated. This mark, being affixed every fortnight, will be found very useful in the spring, in housing the ewes for lambing, and in preventing any lambs being dropped unknown and unseen. Ewes must be got into good condition for the tupping season.

Sheep are smeared with some liquid ointment during this month, to kill vermin, and to prevent rubbing and tearing of the fleece. Tobacco liquor is much used, with a small quantity of the spirit of tar; but it is now most approved to dip the animal in Bigg's composition, dissolved in water, in an immersion of a few minutes, and then drying them on clean bare ground. It kills all vermin, and very much promotes the growth of the wool.

The lambs will require the assistance of artificial food in the end of this month, as the grass will begin to fail. On dry turnip lands, confine the animals on spaces of the crop divided by hurdles, and give fresh spaces as the others are finished. On wet loams, cart the turnips to lea or stubble ground, and cut off the roots on the field where they grow. The sheep intended to be fattened, will require turnips in a similar way.

The bullocks that are foremost in condition must be tied up in stalls singly, or put into yards two or four together, and amply fed with turnips, with the tops and roots cut away. Give the tops to the young cattle, and store flocks of ewes. The young cattle are put into yards six or eight together, and have ample food and litter.

Feed milch cows with cabbages, the tops of turnips, and of beetroot; give hay and straw in chaff, or steam the roots and chaff in mixture. Juicy food is indispensable for the secretion of milk.

Begin to feed hogs for bacon; use steamed food of meals and roots mixed, and finish with hand corn.

Get the manure pit in readiness; fill it with earthy and vegetable matters, in order to absorb the urinary liquid, and clean out all the culverts that lead from the cattle-yards to the tank. The absorption of urine by earthy substances is the best use of liquid matters. Tanks should be roofed over, as the exclusion of light is found to promote putrefaction.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR SEPTEMBER.

The all-absorbing topic of consideration during he whole of the month has been the great excitement observable in the corn trade, and the rapid improvement in the value of wheat and spring corn, including both English and foreign flour. When we calmly consider the general bearings of the trade, and the causes which have led to the excitement, we are in no way surprised at the present comparatively high prices. In the first place, it is quite clear that the total yield of wheat in England this year is nearly or quite one-third less than an average, and that there is no prospect of any falling off in the consumptive demand; on the contrary, looking to the high wages paid to our artizans in all parts of the country, and the scarcity of labour in the metropolis and in all large provincial towns, there appears to be every chance of the demand improving as the cold weather approaches. In the next, we may intimate that a decided scarcity exists in France; the produce of wheat being from 22 to 25 days below consumption for the year; hence French millers and others have become active competitors with us in the Baltic and Black Sea markets for supplies of wheat; and, further, that in spite of the enormously high freights, shipping is comparatively scarce. No doubt, as the season progresses, we shall draw largely from the United States; but, as the arrivals from the continent must of necessity be small, we see very little chance of any decline in prices; on the contrary, there is every prospect of even higher rates. There are one or two features which, however, require to be noticed as being opposed to famine prices, viz., the great abundance of grain in the United States and Canada, the large yield of wheat and all other articles of food in Ireland and Scotland, the full average supplies of last year's wheat on hand, and the large quantities of grain in store at Odessa. Of course the heavy growth of potatoes in this country and on the continent is favourable to the consumers; but the present warlike tone of our advices from the East, in reference to the dispute

between Russia and Turkey, render it impossible for us to calculate with any degree of accuracy as to the extent of our importations from that quarter. At all events, we regard the present value of wheat as of a legitimate character.

Notwithstanding that the weather has been extremely changeable, a steady progress has been made in harvest work. Even in our most backward counties nearly the whole of the crops have now been secured in quite as good a condition as could reasonably be calculated upon. We regret to state that our accounts from nearly all quarters agree in stating that the produce of wheat is decidedly deficient in quantity, and by no means fine in quality. The yield of all spring corn, however, is greatly in excess of last year, the principal increase being in barley, beans, and peas.

The appearance of most potato-fields for some time past has been indicative of extensive disease, the haulm having become much decayed long before the usual period. However, as yet, the tubers have not been affected in an equal ratio; and it is hoped that the actual losses will not be very large. The increased breadth of land under potato-culture this season will, no doubt, compensate for losses by disease; at all events we see no reason to anticipate any scarcity of the article during the whole of the winter. In Ireland the yield has been unusually large, and extensive supplies have been forwarded to Liverpool and elsewhere, and which have found buyers at full average prices, say from 90s. to 120s. per ton.

The growth of most kinds of fruit has been tolerably good this season. Prices, however, have ruled comparatively high, owing to the activity in the demand and the falling off in the imports from France, Holland, and Belgium. The second cut of hay has turned out exceedingly large, and it has been mostly secured in good order. The quantity of grass in the pastures has continued very abundant; consequently there have been no complaints on this head from the graziers.

In Sussex, Kent, and other quarters the picking of hops has been commenced. Up to the present time nearly 1,000 pockets have appeared in the Borough, and sold at from £7 10s. to £13 13s. per cwt., the latter figure being paid for the first arrival. As the produce is coming down light, and the consumption of beer in this country is large, and the export demand very extensive, both new and yearling qualities are likely to continue in active request at corresponding prices. The duty has been done at £155,000 to £165,000. About 350 bales have arrived from the continent.

The crop of seeds is turning out good; yet turnip seed has been selling at high rates, viz., from 19s. to 23s. per bushel. Linseed, rapeseed, and all other articles have been in fair request at good prices.

Everything has gone on prosperously both in Ireland and Scotland. In the former country nearly the whole of the crops of grain have been secured in excellent condition, and the growth of potatoes is represented as considerably in excess of many previous years. In the latter, large patches of land have yet to be cleared of their grain; but present appearances are in favour of the harvest being secured about the usual period. Potatoes are represented as very abundant and of good quality.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The same influences which have operated in favour of an advance in the value of live stock, for some months past, have tended to keep the various markets very firm since we last wrote. In the first place, owing in a great measure to the advance in the rates of wages, a very large consumption has been going on; and, in the second, the actual supplies of home-fed beasts and sheep brought forward have been very moderate, and, comparatively speaking, in middling condition. It is true that large *numbers* have been shown in Smithfield; but at least one-third of them has been derived from abroad. From there having been no improvement in the weight of the foreign stock, it is obvious that the supply of food has not kept pace with our increasing wants. We have before intimated that the quantity of stock in the country is limited, and the events of the three past months have more than ever confirmed us in that opinion. Such being the case, we are in no way surprised at the enormously high prices lately paid for store animals, and the great activity observed in our cattle fairs. Amongst some of the graziers, surprise has been expressed at the present value of beasts in the metropolitan market. They have argued that, according to the prices of lean stock, and the present quotations for sheep, beasts are from 15 to 20 per cent. lower than they ought to be; but they must bear in mind that the imports of the latter description of stock have been considerably in excess of the former—taking weight of meat as the basis of our calculation—and that in most inferior localities, foreign meat is found very saleable and more profitable than English. This must be obvious, when we state that we have frequently known from four to five hundred Dutch beasts sold in Smithfield in the same time that it has taken the salesmen to dispose of from fifty to one hundred from our own grazing districts. The same remark may be applied to calves; and hence many of those who formerly

reared them in Essex and elsewhere, have almost wholly abandoned the trade—preferring to slaughter the animals at home, and forwarding the carcases to Newgate and Leadenhall.

Notwithstanding that the aggregate supplies of stock are unquestionably small, it may be pretty safely assumed that the arrivals of beasts from Lincolnshire, Leicestershire, and Northamptonshire during the remainder of the year will be somewhat in excess of last season, from the fact that great efforts have been made to increase the weight and condition of the stock destined for metropolitan consumption, and that a favourable season has been experienced for the rearing of both beasts and sheep, under the influence of an abundance of natural food. Immense quantities of oilcake have also been consumed upon most farms, and but few, if any, serious cases of disease have been complained of; indeed, we regard the present as by far the most profitable year almost ever recollected—especially to the breeders. That sheep are likely to realize very high prices until quite the close of the year, is evident from the great demand, and the immense general wants; besides, in less than two months from this time, the navigation in Holland will be interrupted, and we shall be almost wholly thrown upon our own resources for supply.

The markets for the sale of hides and skins have been very active, and prices have continued to advance, notwithstanding that the supplies brought forward have been very extensive. Nearly one-half of the calf-skins offered have changed hands on French account.

The recent decree of the government of France admitting foreign stock for consumption at nominal duties—viz., 3 francs per head for oxen or bulls; 1 franc for cows and young cattle; 25 cents. for calves, sheep, and pigs; and 10 cents. for lambs and sucking pigs—is calculated to raise the pretensions of breeders, feeders, and speculators in Holland. In all parts of France, but more particularly in the neighbourhood of large towns, meat is selling at extravagantly high prices; and, in many instances, the butchers have lately experienced great difficulty in obtaining adequate supplies to meet the wants of their customers. The decline in the import duties appears to have been a matter of necessity; and it is most probable that large numbers of beasts, sheep, and calves, which otherwise would have found their way hither, will be purchased in Holland, for shipment to France. Thus, we shall have French competition extended to meat as well as to corn.

The turnip and carrot crops are proving large, and of excellent quality. Although large quantities of hay have been damaged by excessive moisture, the supply for winter use is unquestionably large.

The imports of foreign stock into London have been as under:—

	Head.
Beasts	8,372
Sheep	28,845
Lambs	273
Calves	2,535
Pigs	1,498

IMPORTS AT CORRESPONDING PERIODS.

Sept..	Beasts.	Sheep.	Lambs.	Calves.	Pigs.
1852 ..	6,619	34,759	1,132	2,388	1,847
1851 ..	6,177	28,566	2,075	2,518	1,994
1850 ..	5,556	19,802	1,939	1,819	752
1849 ..	4,214	17,649	734	734	428
1848 ..	4,301	18,000	3,681	1,625	55
1847 ..	4,000	14,000	683	1,362	270

The total supplies of English and foreign stock exhibited in Smithfield have been:—

	Head.
Beasts	27,063
Cows	518
Sheep and mbs	157,750
Calves	3,037
Pigs	3,170

COMPARISON OF SUPPLIES.

	Sept. 1848.	Sept. 1849.	Sept. 1850.	Sept. 1851.	Sept. 1852.
Beasts ..	21,714	19,868	22,212	23,007	24,911
Cows	421	447	475	600	490
Sheep and lambs ..	161,230	168,350	173,450	169,390	148,680
Calves ..	2,707	2,080	2,491	2,220	2,924
Pigs	3,153	1,957	2,639	3,447	2,980

From the northern grazing districts, the bullock supplies have amounted to about 10,200 short-horns; from other parts of England, 3,000 Herefords, runts, Devons, short-horns, &c.; and from Scotland, 410 horned and polled Scots. An arrival of 230 oxen has taken place from Spain.

Beef has been disposed of, at from 2s. 10d. to 4s. 6d.; mutton, 3s. 2d. to 5s. 2d.; veal, 3s. 6d. to 4s. 8d.; and pork, 3s. 4d. to 5s. 2d. per 8lbs., to sink the offal. Lamb has gone out of season.

COMPARISON OF PRICES.

	Sept., 1849.		Sept., 1850.	
	s. d.	s. d.	s. d.	s. d.
Beef, from	2 10 to	3 10 ..	2 4 to	3 8
Mutton	2 10	4 0 ..	3 2	4 0
Veal	3 0	3 6 ..	2 10	3 8
Pork	3 2	4 2 ..	3 2	4 0

	Sept., 1851.		Sept., 1852.	
	s. d.	s. d.	s. d.	s. d.
Beef, from	2 2 to	3 6 ..	2 0 to	4 0
Mutton	2 8	4 0 ..	3 0	4 6
Veal	2 8	3 8 ..	2 10	4 2
Pork	2 4	3 8 ..	2 10	3 10

Very moderate supplies of meat have been on offer in Newgate and Leadenhall. The general demand has ruled steady, as follows:—Beef, from 2s. 8d. to 4s. 0d.; mutton, 3s. 2d. to 4s. 10d.; veal, 3s. 4d. to 4s. 6d.; pork, 3s. 8d. to 5s. 4d., per 8lbs. by the carcase.

METEOROLOGICAL DIARY.

Barometer.			Thermometer.			Wind and State.		Atmosphere.			Weat'r.
Day.	8 a.m. in. cts.	10p.m. in. cts.	Min.	Max.	10p.m.	Direction.	Force.	8 a.m.	2 p.m.	10p.m.	
Aug.24	29.81	29.76	47	67	56	E. by N.	gentle	fog	cloudy	fine	dry
25	29.76	29.50	49	67	59	S. West., Var.	lively	fine	cloudy	cloudy	showery
26	29.37	29.20	55	63	56	S. West	forcible	cloudy	cloudy	cloudy	wet
27	29.34	29.54	52	61	53	S. West	v.brisk	fine	cloudy	fine	showery
28	29.61	29.80	49	64	50	S. West	lively	fine	sun	fine	dry
29	29.80	29.89	46	66	56	Westerly	lively	cloudy	sun	fine	dry
30	30.0	29.95	49	67	53	W.S.W.	lively	fine	sun	cloudy	dry
31	29.94	29.88	48	63	55	W.S.W.	gentle	fine	cloudy	cloudy	rain
Sept. 1	29.75	29.70	52	62	55	S. West	lively	fine	cloudy	fine	wet
2	29.71	29.92	50	55	47	North	gentle	cloudy	cloudy	cloudy	wet
3	30.0	30.23	43	57	51	N. by West	gentle	fine	cloudy	cloudy	dry
4	30.31	30.36	50	67	55	N. by East	liv.clr.	fine	sun	cloudy	dry
5	30.38	30.37	50	65	52	E. by N.	gentle	cloudy	sun	fine	dry
6	30.38	30.26	45	68	52	N. East	brisk	cloudy	sun	fine	dry
7	30.17	30.10	49	58	53	N. East	lively	cloudy	cloudy	cloudy	dry
8	30.03	29.93	50	60	53	Variable	gentle	cloudy	cloudy	cloudy	showery
9	29.92	29.82	58	58	56	Variable	var.	cloudy	cloudy	cloudy	showery
10	29.77	29.85	53	62	50	S. by East	gentle	fine	sun	fine	dry
11	29.98	30.03	43	70	54	Every Way	calm	fine	sun	fine	dry
12	30.05	29.98	53	71	60	S. by East	gentle	cloudy	cloudy	cloudy	dry
13	29.98	30.10	53	60	59	N.W., S.E.	lively	cloudy	sun	fine	showery
14	30.10	30.02	42	68	56	Var., S.W.	gentle	fine	sun	cloudy	dry
15	29.99	30.0	51	63	57	Easterly	airy	cloudy	cloudy	cloudy	rain
16	30.0	29.99	55	65	56	N. East	calm	cloudy	cloudy	fog	dry
17	29.99	30.11		73	57	North	gentle	haze	sun	fine	dry
18	30.15	30.24	48	70	56	W. by N.	calm	fine	sun	fine	dry
19	30.27	30.16	46	70	56	W. by S.	gentle	fine	sun	fine	
20	30.11	30.0	53	60	52	S. West	gentle	cloudy	sun	fine	
21	30.0	29.91	47	68	54	S.S.W.	gentle	cloudy	sun	fine	
22	29.90	29.82	48	65	59	W.S.W.	lively	cloudy	sun	fine	

ESTIMATED AVERAGES OF SEPTEMBER.

Barometer.		Thermometer.		
Highest.	Lowest.	High.	Low.	Mean.
30.410	29.410	74	36	57.8

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
64.66	49.46	57.6

Weather and Phenomena.

Aug. 24. Foggy; fine after sunset. 25. Showery; windy and wet night; and, on the 26th and 27th, gleams of sun. 28, 29, 30. Much better; favourable to the harvest. 31. Sharp showers, and gloomy night.

Lunation.—Last quarter, 26th, 3h. 38m. p.m.

Sept. 1. Fine morning; then, and on the 2nd, profuse rain. 3. Generally overcast. 4. Fine, and airy. 5. Changeable. 6. Clear fine day. 7. Changeable; rich sunset. 8, 9. Changeable; showery. 10. Fine; a mere hint of a shower. 11. Most fine. 12. Overcast. 13. Smart shower; then fine. 14. Superb day; afternoon rather cloudy. 15. Two soaking showers. 16. Gloom; clearing, with gleams. 17 to 22. All dry and fine; the last day somewhat doubtful.

Lunations.—New moon, 3rd day, 11h. 42m. forenoon; first quarter, 10th day, 8h. 58m. morning; full, 17th day, 10h. 12m. morning.

Remarks connected with Agriculture.—Harvest work was certainly interrupted by the changeable weather of the latter week of August and first of September. But much greater have been the complaints made than the injury really sustained; twenty-four dry days in August and fifteen in the three weeks of September instant must have secured abundance of grain. Perplexity and trouble cannot be doubted, but the public are paying heavily in remuneration. As to the green crops and roots, they speak for themselves. The weather has varied amazingly in different localities. In the north drought prevailed; here, in South Surrey, we have had more than our usual quantity of rain, estimated to the 16th of September at about 1 in. 37 cents.

Croydon, Sept. 23rd.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF SEPTEMBER.

The excitement which prevailed in the grain trade when we last addressed our readers, has been further increased since then. Our worst anticipations in regard to the result of the wheat harvest have, we are sorry to say, been realized; and there can be no doubt that in point of quantity the result will be the most unsatisfactory we have had for many years past. As a considerable portion of the spring-sown wheat is still uncut, and in many cases quite green, it would be premature to venture on an estimate of the deficiency; but from what is already known, it is abundantly evident that the acreable yield on the best wheat lands is miserably short. On light sandy soils the result is not so bad; but scarcely an instance has come to our knowledge in which, on testing the produce of a given number of acres by thrashing, the result has come up to expectation. We are now, it must be recollected, speaking of the yield to the acre, irrespective of the shortness of the breadth of land cultivated with wheat. Those who will look back to the weather experienced at seed time, will at once understand the difficulties which were experienced in getting the seed into the ground. In many cases it was impossible to work the land, and on very few farms more than three-fourths of the breadth originally intended for wheat was seeded. If, therefore, the acreable yield had proved a full average, there would still have been a serious deficiency; and, under existing circumstances, it is difficult to form a judgment as to what the deficiency may amount to in quarters. In such a case, figures are much more likely to mislead than to prove useful, especially as we have no authentic data on which to ground a calculation. That this should be the case appears almost incredible; it is nevertheless a fact that statistics are wholly wanted in all matters relating to agriculture. It is not known what number of acres are under tillage, or what is the annual consumption of the different kinds of grain in Great Britain. Mention of this state of things has occasionally been made by different members in the House of Commons, without leading to any result. We have for years past directed attention to the matter, but thus far our legislators have taken no steps to remedy this evil, and in the year 1853 no attempt has been made to organize a system by which reliable information might be obtained on a subject of such vital importance as the production and annual consumption of food. In seasons like the present, the want of authentic information is calculated to lead to one of two great errors—that of false security, or the exaggeration of the difficulties to be encountered. Until lately, the public appeared disposed to pay little attention to the reported deficiency in the crops, more especially as they were under the impression that with free trade in corn, prices could not reach a high point. Latterly the opinion has run in the other extreme, and wheat at 100s. per qr. is looked upon as by no means an improbable event.

We have certainly no wish to encourage undue speculation; but, on the other hand, we consider it our duty to lay the real state of affairs, as far as our judgment will allow us to do so, clearly before our readers.

That the wheat crop of Great Britain is at least *one fourth* short of an average we feel fully convinced; it follows, therefore, that we shall require an unusually large importation to provide for the wants of the population during the next twelve months. Where the requisite supply is to be obtained, and what prices we shall have to pay abroad, are questions of the utmost importance. We referred to these subjects last month, but do not consider it out of place to revert to matters having so direct a bearing on the future range of quotations, more especially as the information since received enables us to speak with more certainty than we were at that time prepared to do.

As the state of France is likely to influence prices here greatly, we shall make that the first subject of inquiry. Some time before the harvest in that country was secure, rumours of a probable deficiency began to reach us; and when cutting had been fairly commenced, we received reports from most of the departments confirming the fears previously entertained. These fears were greatly strengthened by what subsequently took place. The government, dreading scarcity, relaxed the import duties, and it was at once surmised that such steps would not have been taken without sufficient reason: large orders were consequently given by individuals to purchase wheat wherever it could be procured. French buyers visited our markets; orders were sent to the Black Sea, the Baltic, and to America; and considerable quantities of bread-

stuffs were secured before England began to take the alarm. After this had been done, the Government again interfered—an attempt was made to allay the excitement, the shortness of the harvest was denied, and the Paris bakers were prohibited from raising the price of bread. This had a temporary effect, and a slight reaction was caused; but the truth could not be long concealed, the accounts from all parts of the country confirmed the first reports, and it is now generally admitted by those who are the best able to form an opinion, that the wheat crop throughout France is from a fourth to a third short of an average. That kingdom and Great Britain are therefore placed in nearly the same dilemma; both will have to import largely. The competition which must result from these must inevitably drive up the value of wheat in all parts of the world; and we have no hesitation in stating that a high range of prices must be calculated on, from the present time up to the harvest of 1854. What the value of the article may be, during the ensuing winter, it is impossible to foresee; but the advance already established appears to us to have been fully warranted by circumstances, and our impression is that a further rise is a much more probable event than any decline. The eastern question has now arrived at a point scarcely admitting of a hope of an amicable arrangement. The British and French fleets have passed the Dardanelles, the Russian and Turkish forces are advancing to meet each other, and hardly a doubt remains that war must ensue. The Black Sea, from whence France as well as England expected to derive large supplies of wheat, is likely therefore to be closed; and that source is, at least for the present, stopped. The navigation of the Baltic, by merchant vessels, may also become dangerous; and the difficulties of obtaining supplies of corn have therefore become greatly increased by what has occurred in the east since we last addressed our readers. Some idea may be formed of the extent of consumption of foreign corn in this country if we look back to what have been the imports; and we therefore give the following table of the importations into the United Kingdom during the eight months ending 5th September:—

In the Month ended	Wheat. qrs.	Barley. qrs.	Oats. qrs.	Rye. qrs.
5th Feb.	441,678	73,690	80,861	4,474
5th March	136,704	32,666	31,036	682
5th April	287,153	59,672	15,868	20,243
5th May	343,400	112,072	69,333	11,584
5th June	525,236	131,296	123,538	9,038
5th July	331,193	55,742	47,841	1,724
5th Aug.	691,737	132,233	85,021	11,712
5th Sept.	546,924	68,721	166,231	7,102
Totals	3,304,025	666,092	619,729	66,559

	Beans. qrs.	Peas. qrs.	Maize. qrs.	Flour. qrs.
5th Feb.	41,474	12,553	95,924	305,620
5th March	10,655	5,412	54,532	260,970
5th April	30,906	1,659	214,508	762,206
5th May	27,353	5,705	174,128	535,743
5th June	24,111	7,119	163,496	341,964
5th July	32,795	12,434	118,172	369,843
5th Aug.	40,091	4,951	288,222	379,249
5th Sept.	30,994	3,103	173,565	381,611
Totals	238,379	52,936	1,282,547	3,337,266

Notwithstanding these enormous arrivals, the stocks in warehouse are only moderate, more especially of fine qualities of wheat; and there is scarcely any fresh flour in store except what may be held at Liverpool. By far the greater portion of the import has gone into consumption almost as soon as it has been received. This, it must be recollected, has been the case when there has been no scarcity of home-grown grain; for though the quality of the wheat crop last year was inferior, the quantity was not complained of. What, then, are our requirements likely to be, under existing circumstances? and from whence can we expect to obtain the additional quantity? To give a satisfactory answer to these questions is out of our power; but there can be no doubt that Great Britain will need to import more extensively than she has yet done in any year since free-trade, and we have already shown, in the foregoing part of the article, the increased difficulties which exist to obtaining large supplies. We have endeavoured to guard against exaggeration: the facts advanced are, in our opinion, undeniable; and it follows, therefore, that a strong probability exists of prices of bread advancing to a point likely to cause great deprivations to the poorer classes of the community. Economy in the consumption of food now may avert scarcity hereafter; and we are consequently inclined to consider the advance which has taken place in prices as a favourable circumstance. So much for the probable future. We shall now attempt to give as clear a report as possible of the changes which have taken place at Mark-lane since our last.

We do not remember so much excitement as that of the last two months, for a long time past; indeed, nothing at all to be compared to it has occurred since the memorable year of the first appearance of the potato disease, 1847. The arrivals of wheat of home-growth into the port of London have been smaller than is generally the case in the month of September, and a less proportion of new has thus far been brought forward than usual. The activity which prevailed at the close of last month received a temporary check in consequence of very liberal supplies from abroad

during the week ending 10th inst. The commoner kinds of English wheat were about this period sold 1s. to 2s. per qr. below the highest point previously attained; but this trifling decline was almost immediately afterwards recovered, and quotations are now 10s. to 12s. per qr. higher than they were at the close of last month. Scarcely any of the English wheat which has been brought forward has been taken by speculators: the town millers have been the principal buyers; a few lots have been purchased for shipment to the north of England, and several small cargoes have been collected by purchasers from France. The opening prices for new wheat were as stated in our last number—52s. to 56s. for red, and 58s. up to 63s. per qr. for white. On the 19th, these rates were exceeded by about 10s., and on Monday last 63s. to 68s. per qr. was obtained for good runs of red, and from 68s. up to 75s. per qr. for the finer kinds of white wheat; indeed, many holders asked 80s. per qr. for picked lots of the latter. We have already referred incidentally to the extent of the arrival of foreign wheat in the early part of the month, when 88,000 qrs. were received at this port in a single week. This large supply was the accumulation caused by a prevalence of westerly wind for several preceding weeks. Some of the vessels from the Baltic had been a long time on passage, and the cargoes having become heated on the voyage, a considerable portion had to be immediately landed. Part went direct to the millers, and the proportion offered from on board ship, on the market, was therefore not particularly large. Since then the receipts have been on a more moderate scale, and importers have at no time manifested the slightest disposition to lower their pretensions. The temporary reaction, which took place in prices of English wheat the first week in the month, failed to influence the value of foreign, and the upward movement has since been quite as rapid in the latter as the former. That a good deal has been bought on speculation cannot be questioned, but the transactions have not been of the same nature to those which took place in 1847. A few individuals were then the great buyers, whose means were altogether inadequate to warrant the enormous operations they entered into. The consequence was a crisis: the ruin of those who had been induced to allow themselves to become involved in the speculations, and a fearful reaction in prices. A totally different state of things now prevails. A large portion of what has been bought has been purchased for export to France, and has been paid for. Small speculative operations have, no doubt, been entered into; but sellers have acted with more than ordinary caution, and we regard the trade as in a thoroughly sound state. There are hardly any large holders, and we believe that there is not a greater amount of corn paper in circulation than usual. The rise which has taken place in prices will be best shown by giving the quotations current at the close of last month and the prices now asked. These will stand as follows:—Good Lower Baltic red wheat might have been bought at the end of August at 60s. to 63s., Danzig at 63s. to 68s., and Black Sea wheat was then worth from 45s. up to 52s. or 53s. The prices paid on Monday were for Pomeranian, Uckermark, and similar sorts 68s. up to 72s., and for Danzig 78s. per qr. was, we believe, in one or two cases given. Inferior Danube wheat realized 55s. to 58s., and fine Marianople 64s. to 66s. per qr. The rise in the value of floating cargoes has been fully as great as that established on parcels in granary; indeed, relatively higher rates have been paid for the former than for the latter, in cases where the vessels had been chartered with the continental clause—that is to say, where the captain had received instructions to call for orders at a particular port, to be informed as to whether the ship was to discharge in England or abroad. Buyers from France have taken cargoes of this description eagerly, as by so doing they have saved the expenses attending re-shipment. The prices last paid have been 42s. to 45s. for Egyptian Saide wheat, 53s. to 55s. for Polish Odessa, and 62s. up to 64s. for fine Marianople, Berdianski, and similar sorts, cost, freight, and insurance. For red wheat from the Lower Baltic ports 58s. to 60s., and for fine white Polish and high-mixed Danzig 63s. to 66s. per qr., free on board, has been lately demanded. These rates have been deemed too high, and comparatively few bargains have consequently been closed. The town millers have become alarmed at the continued rise in prices of wheat, and have been very unwilling to enter into forward contracts to deliver flour. They put up the price last month, with a view of protecting themselves, 10s. per sack, and have since again advanced 10s.: the nominal top quotation is therefore now 70s. per sack.

Household flour has risen in the same proportion, and American must be quoted 3s. to 5s. per brl. higher than when we last addressed our readers. The arrivals from the other side of the Atlantic have not thus far been large, but a considerable quantity is known to be on passage; the probability is, however, that the supply will not be in excess of the demand, as fresh quantities are at present much wanted.

Though the opening prices for barley have been very high, the supply of English has thus far been quite moderate, which would lead to the impression that this crop has not given so good a return as was expected would have been the case. The quality of the samples hitherto exhibited has not been by any means fine, and superior malting sorts are likely to be scarce. The best parcels have met a ready sale at Mark Lane, at improving rates: in the beginning of the month 40s. to 42s. per qr. was realized; since then 44s., and even 45s. per qr. has been paid for picked lots. This grain has suffered materially in quality by the frequent heavy showers experienced during harvest time; and in many cases, where sown with clover, the injury to the colour has been so great as to render the sample unfit for malting. The arrivals of foreign barley have not been large; and the greater part of what has come to hand has consisted of Black Sea sorts. Good Baltic barley has been much inquired for, and has commanded very full terms. A parcel from Konigsberg, sweet but not heavy, the weight being only 50lbs. per bushel, was sold last week at 35s. per qr.

The large export demand for ale has caused an unusually great consumption of malt for several

months past, and stocks of old have been reduced into a very narrow compass. Of new, scarcely any has as yet made its appearance. The rise in the value of the article during the month has amounted to at least 2s., and superior Ware is now worth 70s. per qr.

Oats of home growth have come forward sparingly, and the receipts from the near continental ports have been small; from Russia, however, we have had a larger supply than had been calculated on, and the arrival of upwards of 100,000 qrs. from Archangel, St. Petersburgh, and Riga, during the week ending 10th inst., had a depressing effect on the market. The trade recovered, however, almost immediately, and prices have since risen considerably more than they had previously fallen. The lowest sales of Archangel oats were at 19s. to 19s. 6d. per qr., a-week afterwards 20s. to 20s. 6d. was paid; afterwards sales were currently made at 21s. to 22s.; and on Monday, 26th inst., there were no sellers below 22s. 9d. per qr. The quality of the Russian oats is this year very inferior, and few of the samples weigh more than 35lbs. to 36lbs. per bushel. Of English oats there are none worth naming on the market, and quotations cannot be given with accuracy. Scotch are likewise very scarce; for good feed 28s. per qr. was paid on Monday, and fine potato brought 30s. to 32s. per qr. The few parcels of Irish that have come forward have met with ready takers. In the early part of the month prices ranged from 22s. to 24s., since then 25s. to 27s. per qr. has been paid. The average advance, taking all kinds of oats, may be fairly estimated at 2s. to 3s. per qr. since our last.

Old beans have become scarce, and but few new have as yet made their appearance. The crop is not so well spoken of as it was a month ago; and the rise in the value of all other articles has naturally had its influence on prices. The terms now asked are certainly 2s. to 3s. per qr. higher than those at which purchases might have been made a month ago. The stock of Egyptian beans in granary has been materially reduced, and the accounts lately received from Egypt, stating that the export had been prohibited, has had the effect of causing much higher rates to be asked.

Peas have come to hand very sparingly; indeed, we may say that the London market is quite bare of the article. The first lots of new white boiling peas which appeared, sold at 48s. to 50s.; afterwards 55s. to 56s. was paid, and last Monday sales were, we believe, made at 60s. to 63s. per qr. Grey and maple may be had at relatively lower rates; and old foreign peas have not risen more than about 5s. per qr. The extraordinary demand for ship-stores, in consequence of the continued emigration to Australia, &c., may in some measure account for the extreme scarcity of peas suitable for splitting.

Until within the last few weeks Indian corn met with little attention: this was, no doubt, owing to the favourable accounts received, until lately, from Ireland, in regard to the potato crop; latterly, however, the reports from thence have become much less satisfactory, and orders to buy floating cargoes of Indian corn on Irish account have come to hand both here and at Liverpool. This, and the continued rise in wheat, have given an impetus to prices of the former article, and as much as 38s. up to 40s. per qr., cost and freight, has been paid for the finer kinds, such as Galatz and similar sorts.

Having already referred to the state of affairs in some of the foreign markets, we need not go into this part of our subject at great length; still we deem it necessary to give our readers the substance of the latest advices we have from the principal ports on the continent.

Our letters from the Baltic are almost unanimous in stating that stocks of old wheat have been nearly exhausted by the large shipments made to Great Britain and France, and that the result of the harvest has been unsatisfactory, both in regard to quantity and quality.

Letters from Danzig and Konigsberg inform us that samples of the new wheat had come forward, which had afforded the means of forming an opinion as to the quality and the inferiority of the same, and led holders of old to demand materially enhanced terms. The weight of the new which had come to hand had ranged from 56 to 58lbs.; and 59 to 60lbs. per bushel was considered greatly above the average. Unless the produce of Upper Poland—from whence no samples had yet appeared—should prove much better, it was feared that only a small proportion of the growth of this year would be of fit quality to stand a voyage to Great Britain or France. At Danzig 66s. per qr. free on board had been asked for superior high-mixed old wheat, whilst the inferior new had been offered at from 55s. to 56s. per qr., according to weight and condition. The potato disease is said to be very prevalent in the neighbourhood of Danzig and Konigsberg, and rye was bringing extraordinarily high prices.

The advices from Stettin are of a similar nature, with this exception however—that a portion of the wheat crop had been well saved, and would afford good shipping quality. Old red wheat of 61½lbs. was not obtainable below 60s., and white Polish had realized 65s. per qr. free on board.

At Rostock hardly any stocks of old wheat remained on hand, and the supplies of new had scarcely sufficed for the local consumption. For the former 60s. per qr., free on board, had been bid in vain, few holders being inclined to sell. All kinds of spring corn, rye, &c., are equally high; and so little barley and oats had been brought to the different markets, that there had been none to spare for export.

At Hamburg the rise in the English markets has been very closely followed. The electric telegraph has made every change here known almost immediately; and prices have been so nearly on a level with our own, at this and other near ports, that no margin has remained for profit.

In France quotations are still above ours; and though there is not much inducement to ship, still purchases continue to be made here, from time to time, for that country.

From thence, and the Mediterranean ports, England cannot expect to receive any supplies; indeed, the probability is that the balance of prices will be the other way.

We now come to the Black Sea. The harvest in South Russia and in the Danubian States has, we learn, been very productive; and good stocks of old wheat are, besides, held at Odessa, Galatz, &c. We might, consequently, have received considerable assistance from the east, but for the political state of affairs between Russia and Turkey. The position of matters there is now, however, so threatening, that war (if not actually commenced) appears almost inevitable, and it would therefore hardly be safe to place much reliance on large supplies from the Black Sea.

In Egypt the crops do not appear to have given a satisfactory result, the exportation of grain from thence having been prohibited.

It appears, then, that our great dependence must be America. That a large quantity of wheat and flour can be furnished by the United States and Canada we have no doubt; but will the extra quantity which high prices may draw from the other side of the Atlantic compensate for the probable withdrawal of the Black Sea supply, the total cessation of shipments from France, and the falling off in the quantity which the Baltic would have afforded if the harvest in Poland, Prussia, &c. haad been favourable? We fear not.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter				
WHEAT, Essex and Kent, white.....	63 to 68	fine	up to	76
Ditto ditto new....	65	68	fine	78
Ditto ditto red..... 58	62	61	„	67
Ditto ditto new	61	68	„	71
Norfolk, Lincoln. & Yorksh., red..	59	64	„	67
BARLEY, malting, new.. 40 42	Chevalier..		43	45
Distilling .. 32 36	Grinding..		32	34
MALT, Essex, Norfolk, and Suffolk, new	60	62	extra	64
Ditto ditto old	58	60	„	62
Kingston, Ware, and town made, new	65	66	„	69
Ditto ditto old	63	65	„	67
OATS, English feed.. 21 24	Potato..		23	26
Scotch feed .. 24 26	Potato..		26	27
Irish feed, white	20	22	fine	25
Ditto, black	20	21	fine	24
RYE.....	34	38	old —	—
BEANS, Mazagan.....	39	40	„ 40	41
Ticks.....	40	42	„ 42	44
Harrow.....	41	43	„ 43	45
Pigeon	41	45	„ 45	49
PEAS, white boilers 56 60.. Maple 45	48	Grey	40	42
FLOUR, town made, per sack of 280 lbs. —	—	„	65	70
Households, Town 52s. Country —	—	„	54	60
Norfolk and Suffolk, ex-ship .... —	—	„	52	55

FOREIGN GRAIN.

	Shillings per Quarter				
WHEAT, Dantzic, mixed.. 63 to 64	high mixed	68	72	extra	76
Konigsberg..... 62 63	„	66	68	„	71
Rostock, new 68 71	fine	71	„		73
Pomera., Meckbg., and Uckermk., red	66	67	extra ..		68
Silesian.....	„ 64	66	white	66	68
Danish and Holstein	„ 63	64	„	64	65
Rhine and Belgium	„ —	—	old	—	—
Odessa, St. Petersburg and Riga..	54	56	fine	56	58
BARLEY, grinding 30 34	Distilling..		34	36	
Malting.....	none		—	—	
OATS, Dutch, brew, and Polands 24s., 26s. ..	Feed ..		22	24	
Danish & Swedish feed 22s. 6d. to 23s. 6d.	Stralsund		23	24	
Russian..... 21 22	French..		21	22	
BEANS, Friesland and Holstein			37	40	
Konigsberg.. 39 42	Egyptian ..		36	38	
PEAS, feeding 46	48	fine boilers	49	51	
INDIAN CORN, white..... 37	42	yellow	37	42	
FLOUR, French, per sack (none) —	—	none	—	—	
American, sour per barrel 32	33	sweet	35	40	

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.

WEEK ENDING:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
Aug. 13, 1853..	53	3	30	0	22	3	34	9	41	5	36	9
Aug. 20, 1853..	51	1	29	7	22	0	34	10	40	11	34	9
Aug. 27, 1853..	48	6	29	6	21	6	33	8	41	1	36	6
Sept. 3, 1853..	50	4	30	4	21	10	32	3	41	1	37	2
Sept. 10, 1853..	54	9	31	3	21	11	33	6	41	3	37	8
Sept. 17, 1853..	56	7	34	9	20	6	35	7	41	9	39	8
Aggregate average of last six weeks	52	5	30	11	21	8	34	1	41	3	37	1
Comparative avge. same time last year	42	0	27	9	19	6	30	3	34	1	30	11
DUTIES.....	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Av. s.	d.	Averages from the corresponding *Gazette* in 1852.	Qrs.	Av. s.	d.
Wheat....	93,539 ..	56	7	Wheat....	93,857 ..	40	5
Barley....	3,706 ..	34	9	Barley....	7,897 ..	27	4
Oats	11,086 ..	20	6	Oats	11,781 ..	18	7
Rye.....	512 ..	35	7	Rye.....	849 ..	30	1
Beans....	1,448 ..	41	9	Beans....	1,975 ..	34	4
Peas	490 ..	39	8	Peas	1,361 ..	29	10

PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.).. sowing 54s. to 58s.; crushing 45s. to 50s.
Linseed Cakes (per ton)..... £8 10s. to £10 0s.
Rapeseed (per last)..... £27 to £29
Ditto Cake (per ton)..... £4 15s. to £5 5s.
Cloverseed (per cwt.)..... (nominal) .... 00s to 00s.
Mustard (per bush.) white new 15s. to 20s., brown old 10s. to 14s.
Coriander (per cwt.)..... old 9s. to 12s.
Canary (per qr.) ..... 50s. to 60s.
Tares, Winter 8s. 6d. to 8s. 9d.. Spring, per bush., (none)
Carraway (per cwt.)..... 38s. to 40s.
Turnip, white (per bush.)..... Swede (nominal).....
Trefoil (per cwt.) ..... 17s. to 21s.

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

MONDAY, Sept. 26.

The supplies of home-grown Potatoes are tolerably good. The arrivals from abroad last week were about 600 tons, chiefly from France. A full average business is doing, as follows:—Shaws, 105s. to 115s; Regents, 120s. to 140s.; and Foreign, 105s. to 112s. per ton.

POTATO MARKETS.—YORK: We had a good show of Potatoes, which sold at from 2s. to 2s 3d. per bush—7d. to 8d. per peck. LEEDS, Sept 20: We had a fair supply of Potatoes. Wholesale, 8½d. to 9d.; retail, 10d. per 24lbs. LEEDS, Sept. 20: Potatoes, of which we had a fair supply, were sold, wholesale, 8½d. to 9d per 21lbs; retail, 10d. MANCHESTER, Sept. 20: Potatoes, 8s. 6d. to 12s. per 240lbs.

WOOL MARKET.

BRITISH WOOL TRADE.

MONDAY, Sept. 26.

Since Monday last, the amount of business doing in our market has been very limited. In prices, however, we have no change to notice. The stocks have not increased, and we have little or no export inquiry. The advance in the value of money keeps speculation in check.

	s.	d.		s.	d.
South Down Hoggets	1	4	*to*	1	6½
Half bred ditto	1	4	—	1	6
Ewes, clothing.....	1	2	—	1	3½
Kent fleeces.....	1	1½	—	1	3
Combing skins.....	1	1	—	1	5
Flannel wool	1	0	—	1	5
Blanket wool	0	8	—	1	0½
Leicester fleeces.....	1	2½	—	1	4

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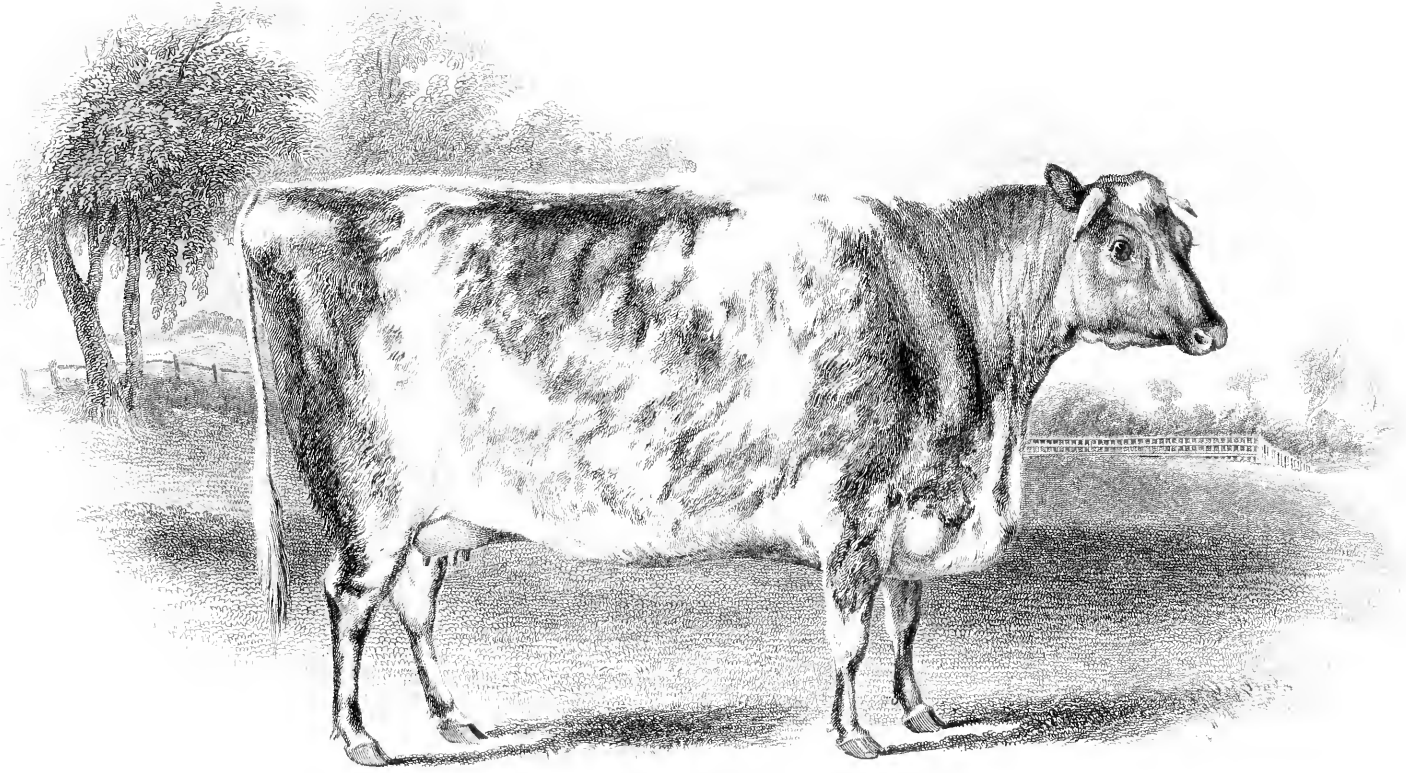
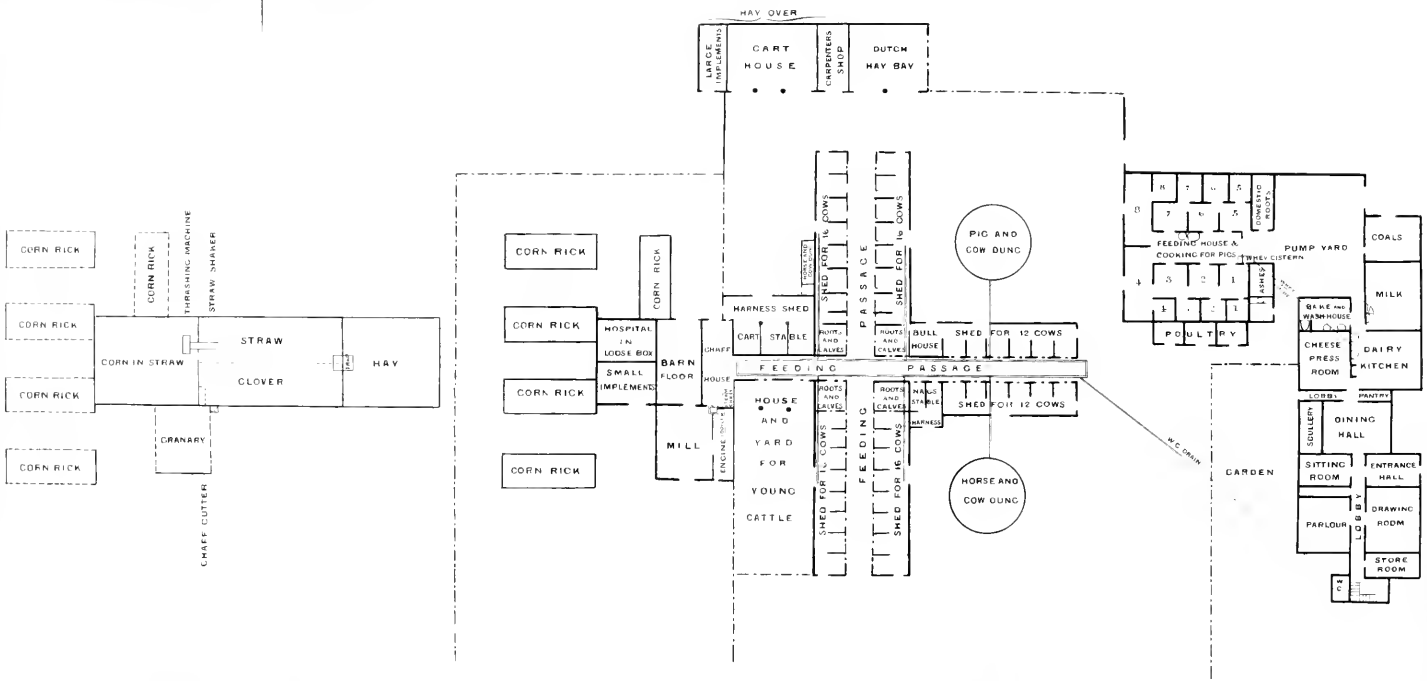


Plan of
TATTENHALL HALL

AS CONTEMPLATED BY THE OWNER T CRALLAN ESQ^R

WITH NEW & ENTIRE DAIRY FARMERY

DESIGNED BY THE TENANT GEORGE JACKSON



FIRST FLOOR.

GROUND PLAN.

The Liquid Manure Tank & Drains are shewn thus ———

NOVEMBER 1853

THE FARMER'S MAGAZINE.

NOVEMBER, 1853.

PLATE I.

A SHORT-HORNED COW,

"VELLUM," (*Herd Book, vol.* ix., *page* 488.)

THE PROPERTY OF MR. HENRY SMITH, OF THE GROVE, CROPWELL BUTLER, NEAR BINGHAM, NOTTINGHAMSHIRE.

Roan, calved April 1st, 1849, bred by Sir Charles R. Tempest, Bart., of Broughton Hall, near Skipton, Yorkshire; the property of Mr. Henry Smith, of the Grove, Cropwell Butler, near Bingham, Nottinghamshire. Got by Abraham Parker (9856), dam (Miss Valentine) by Beggarman (3118), g. d. (Victoria) by Duke (3629), gr. g. d. (Venus) by Young General (3866), gr. gr. g. d. (Maria) by Western Comet (689), gr. gr. gr. g. d. (Lovely) by General (272), gr. gr. gr. gr. g. d. (Bright Eyes) by Marquis (407), gr. gr. gr. gr. gr. g. d. by Simon (590), gr. gr. gr. gr. gr. gr. g. d. by Traveller (655) gr. gr. gr. gr. gr. gr. g. d. by Mr. Robert Collings' Lame Bull (357).

The first Prize of £20 was awarded to Vellum as the best cow in-milk or in-calf, at the Meeting of the Royal Agricultural Society at Gloucester, in July, 1853.

She also obtained the first prize given by the Nottinghamshire Agricultural Society, at their Meeting, held at Newark, on the 27th of September, 1853, beating twelve others.

PLATE II.

PLAN OF TATTENHALL HALL,

AS CONTEMPLATED BY THE OWNER T. CRALLAN, ESQ.,

WITH NEW AND ENTIRE DAIRY FARMERY,

DESIGNED BY THE TENANT MR. GEORGE JACKSON.

Our second engraving comprises the ground plan of Tattenhall Hall, with new and entire dairy farmery, designed for eighty-eight cows, two bulls, six draft and two nag horses, yard and house for young cattle, eight piggeries, poultry, &c.; with water and steam corn mill attached, supplying power at single motion always available for churning, turnip cutting, oil-cake crushing, bone grinding, sawing, thrashing, winnowing, and forcing liquid manure through tubing on to the farm land.

Unquestionably, the farmery is to the farmer what the cotton-mill is to the manufacturer, viz., his means of converting the *raw* material into marketable merchandise, or *profit*, with the least possible waste and smallest cost of labour; and every plan of farm buildings must, for this purpose, have three distinct points of comparison—"Economy of construction," "Healthy arrangement," and "Convenience in use," saving labour, which is a saving of money. To combine these three in one design, "is a consummation devoutly to be wished." The designer of these models and plans has aimed at this: and he invites the criticisms of amateur and *practical* graziers and dairy men, to point out wherein he has failed.

The following are brief explanations. The first crop secured is usually clover; and when carted home,

the shaft horse should pass between the pillars of the young cattle house, over which and the south-west "root" house about ten tons of clover would be conveniently stowed for use. The next crop, hay, about 15 tons, in like manner, over the "bull house," "nag's stable," and the two east "root houses."

The first ripe and dry wheat to be thrashed from the field, both because the first dry wheat to market usually gains the best price, and straw is provided for thatching stacks; the thrashing from the field only requiring a man and boy extra to the hands needed for stacking or mowing. The grain descending from the thrashing machine into three sets of winnowing riddles; trialed, separated, sacked, weighed by miller and trucked into the mill, leaving the "tailings" to be finished afterwards.

The corn barn over the "hospital," "implement," and "barn floor," is filled during harvest with corn in straw, suited for dairy stock in winter; thus the whole barn range is occupied, and the rest of the corn crops on a dairy farm of more than 400 acres can be conveniently placed around the corn barn, as shown in the plan, so as to be put through the sheaf holes to the thrashing machine, without horses or loss, in about half the time, and less than one-third of the labour of moving the stacks to the barn with carts and horses.

The chaff is blown into the chaff house or kitchen, and the straw delivered by shakers to the straw barn, and stowed over the cart stable and north-east root house, which, when required, would be as conveniently as the clover and hay, put through the trap at the junction of all the feeding passages, ready to be given at pleasure by one man in charge of feeding the entire live stock.

The mangold and turnip tops from the field are taken in the cart down the feeding passages, and put direct to the cattle; and the bulbs stored in the four root houses, which are afterwards equally useful and central for the calves.

The chaff cutter is contiguous to the straw and hay, which, as cut, descends into the steam-chest, to be cooked by steam in the boiler when the engine stops; or be passed to the chaff house, and used dry as required; the chaff house serving as kitchen, with hot water from the boiler, and cold water from the pump, for the whole of the dairy stock and horses.

The liquid manure tank admits of short drains, and its contents can in this case either be run into a liquid manure cart, or, what is preferable, forced by the engine through pipes, and distributed to the land with fire-hose.

The principle of the plan, placing the corn barn in the stack-yard, and the straw barn to the feeding passages, is equally adapted to the smallest as the largest farms, by reducing the dimensions of the barn range and diminishing the sheds.

THE FOOD OF LIVE STOCK.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

By the time that this paper reaches the readers of this magazine, the farmer will be busily engaged in caring for the winter food and comfort of his live stock. At such a period, a retrospective glance at what has been recently done towards the more profitable conduct of this great branch of the farmers's vocation may not be unattended with benefit. The memory of the reader will remind him that however almost imperceptibly gradual has been the march of improvement in stock feeding, yet great indeed has been the advance since the English farmers of the time of the House of Tudor were compelled to kill their live stock and salt their meat about Martinmas, because they then had not green or other food to keep them through the winter. Tusser, writing about the year 1557, in advising the English farmer for November's husbandry, says:—

"For Easter, at Martinmas hang up a beef,
For stall-fed and pease-fed, play Pickpurse the thief;
With that and the like, ere on grass beef come in,
Thy folk shall look cheerly when others look thin."

This was the practice, let us remember, only three centuries since. It was more than a century after the days of Tusser that another English Agricultural writer, Worlege in his "Mystery of Husbandry," edition of 1669, tells us "that although turnips be usually nourished in gardens, and be properly a garden plant, yet are they, to the very great advantage of the husbandman, sown in his fields, in several places in England, for the food of cattle." And he notices, what may surprise some modern improvers, that "in Holland, they slice their turnips, with the tops, and rape-seed cakes and grains, &c., and therewith make mashes for the cows, and give it them warm, which the cows eat like hogs." It was twenty years after this that Houghton, in his "Husbandry," first mentions turnips as food for sheep. Swede turnips come long afterwards; mangel wurzel not till the present century. It is still more recently that the feeding of live stock has been conducted with anything like scientific principles; that the difference between heat-producing and flesh-forming substances has been remarked, or any valuable observations made upon the effect of warmth, change of food, &c. I have in another place (*Farmer's Almanac*) given a brief digest of some of the principal trials recently made by practical farmers. On this occasion I propose to enlarge upon that little collection of authorities.

Dr. Lyon Playfair has given, from the result of

his chemical investigations (*Jour. R.A.S.*, vol. vi., p. 560), the following table of the quantity of food necessary to produce 1 lb. of flesh—

100 lbs. of turnips	7.4 lbs. of bread
50 lbs. of potatoes	7.4 lbs. of flour
50 lbs. of carrots	4 lbs. of lean meat
25 lbs. of cow's-milk	3½ lbs. of peas
9 lbs. of oatmeal	3.3 lbs. of beans
7.1 lbs. of bar.-meal.	

A healthy ox, remarks Mr. F. Dorn, of Edinburgh, in his prize essay (*Trans. H.S.*, 1852, p. 137) consumes nearly one-fifth of its own weight of turnips daily, or about one-fiftieth of its weight of hay, straw, and such other dried food. Cattle of 50 stone, allowed straw *ad libitum*, will consume from 150 to 180 lbs. of turnips daily. Boussingault considers as a sufficient allowance, 6 lbs. of mixed food, or 4 lbs. of hay, for every 100 lbs. of living weight; or otherwise about 30 lbs. per day of a mixture of equal parts of grass and hay for cattle of 30 stone weight. With an annual experience in fattening upwards of 250 cattle in stalls and in boxes, Colonel M'Donall, of Logan (*Jour. R.A.S.*, vol. xiii., p. 113), finds 80 to 100 lbs. of cut swedes per day given in two feeds, morning and afternoon, and a cooked feed (3 lbs. of cut straw boiled with 3 lbs. of beanmeal) quite sufficient to fatten cattle of from 40 to 50 stones. The substitution of the cooked midday feed for one-third of the former allowance of turnips has enabled him to increase the number of the fattening cattle one-third. After the value of the artificial food is deducted, each lot of cattle, he finds, leaves for the swedes contained (30 tons per acre) the following return, viz., by—

Box feeding .. 4¾d. p. cwt. or £11 17s. 6d. p. acre.
Stall feeding .. 4¼d. „ or £10 12s. 6d. „
Shed feeding.. 3¾d. „ or £9 7s. 6d. „

A continuation of these valuable trials of Colonel M'Donall are reported by Mr. D. M'Culloch (*Trans. High. Soc.*, 1853, p. 65). They were designed, he says, to aid in determining a very important question to the farmer, viz., the economic value of different kinds of food for the feeding of cattle, and the combinations in which they should be given to secure the largest net return.

In the following trials all the cattle were Galloway bullocks, and each lot comprised 2 two-year-old and 1 three-year-old animals. They were all accustomed to the particular food on which they were fed for three weeks before the test of the experiment commenced. Each animal, except those in lots Nos. 4 and 5, and Nos. 20 and 21, received the same money value during the experiment (25s. worth) of extra food in different combinations, and purchased at the following prices:

Beanmeal	£7	0	0 per ton.
Oilcake	£7	15	0 „
Rape cake	£4	10	0 „

Hay cut before flowering valued at 6d. per stone of 28 lbs.
Hay cut when in flower, do. .....5½d.
Hay cut when ripe, do. .....5d.

The trial lasted for 100 days, viz. from Dec. 20th 1852, to March 1853. It was made at Logan Mains, in Wigtonshire, with sixty-five head of cattle in nineteen lots of three each and in two lots of four each for the same period; one in a loose box, the other in stalls.

The following table gives the live weight of the three cattle, I. on the 20th December, II. on the 29th March.

	I.			II.		
	Cwt.	qr.	lb	Cwt.	qr.	lb.
1. Mangold and beanmeal	25	0	4	29	0	10
2. Turnips and ditto.....	25	0	2	29	0	0
3. Ditto and oilcake	25	0	17	29	1	11
4. Mangold alone	25	0	5	29	1	2
5. Turnips do.....	24	3	23	28	3	4
6. Two feeds ditto, and cooked ditto	24	3	23	29	2	0
7. Do. mangold and do...	24	3	24	29	0	11
8. Do. turnips and cooked food of rapecake	24	3	23	28	0	0
9. Two feeds, small mangold and cooked food	24	3	3	29	0	11
10. Do. large, do., and do.	24	2	3	28	1	8
11. Turnips grown on good land, and cooked food	25	1	16	29	3	0
12. Do. grown on poor land and do.	25	1	7	28	1	23
13. Hay cut green for fodder	24	0	4	28	3	15
14. Hay cut when in flower	23	2	5	28	1	27
15. Do. cut when ripe, do.	24	0	6	27	3	16
16. Oat-straw for fodder ..	24	0	15	28	2	24
17. Long red mangold....	23	2	11	27	1	9
18. Yellow globe do.....	23	1	13	27	1	11
19. Carrots white	23	0	5	27	1	14
20. Fed in loose box.....	29	0	2	35	1	12
21. Fed in stalls.....	29	0	6	34	3	6

Four cattle in each of the two last lots.

The amount of green food consumed by each animal (given in cwts.) is reported in the following table.

Lots.		Lots.	
1	84¾	12	89¼
2	116	13	89¼
3	116	14	89¼
4	107	15	89¼
5	133½	16	89¼
6	89¼	17	62½
7	71½	18	62½
8	89¼	19	75
9	67	20	133½
10	67	21	133½
11	89¼		

The whole paper is every way worthy of the attentive study of the stall-feeder. The superior return from cooked beanmeal over the uncooked, and of oat-straw compared with hay, is well commented upon in this valuable prize essay.

Let the keeper of live stock remember, amongst other things, that the food of cattle requires to be of a certain *bulk*—the stomach requires a certain mechanical stimulus, which the bulk of the food naturally imparts to it. *Occasional overfeeding* produces derangement of the digestive organs, hoven, and diarrhœa: *habitual* overfeeding produces an enlarged liver, puerperal fever, black-quarter. *Deficient food*: Animals, even before birth, are affected by insufficient food: insufficient food during pregnancy, besides rendering the young at the time of birth small and weakly, has also the injurious effect of curtailing the provisions necessary for its future sustenance: the milk secreted is small in quantity, or if it be considerable in bulk is poor in quality; nor will even the most liberal aliment given after the birth of the young one always remedy the evil. Surely, then, it is false economy to put pregnant cows on an over-restricted diet. Remember, too, that there is no period in the life of an animal in which the effects of insufficient food are more prejudicial than in early years; this is far too often the case with regard to calves; the calf, after a week or ten days, should be liberally supplied with milk, and for six or eight weeks should receive only new milk, from 8 to 10 pints per day, divided into at least 3 meals; then skimmed milk may be gradually substituted for a part of the new milk—milk should, during three or four months, form its principal food; then the calf may be gradually accustomed to other sorts of diet, especially to oil-cake. Calves should be housed at night before the weather becomes cold and inclement, after their first summer's grass. Young cattle are generally placed in sheds or courts, but their feeding often receives too little attention; the result is unthrifty coats, lank limbs, and potbellies—these again, when they are suddenly put upon a more liberal diet, become liable to various casualties, such as purgative, congestive fever, abortion, epilepsy, and various cerebral affections. When the *bulk* is insufficient, and the quality poor, the digestion is impared; thus straw is apt, when used exclusively for some time, to cause distension, constipation, and fardel-bound, and afterwards dysentery. When cattle are put up to fatten, about their second or third year, the evil effects of early bad feeding are apparent by the length of time required for fattening. In milk cows more than in any other kind of cattle, an unusually large supply of food is requisite, not only to support the condition of the body, but also an overplus from which the milk may be formed. *In sheep*, insufficient food produces thinness and lightness of fleece, coarseness and brittleness of fibre; general debility, and emaciation; excessive liability to the attacks of the fly; purgative, dropsical swellings, hydalids in brain, typhoid fevers, braxy, and scab. *Change of food*: On the advantages of this we need not dilate, or its preparation, or the regularity which should be observed in feeding. *Exposure to wet*: Its most uniform effects are a tendency to diarrhœa and muscular relaxation; there is a marked tendency to anarsaca, and œdamatous swellings observed amongst men and animals living in moist localities. Wet weather is apt to induce rheumatic enlargements of the joints, foul in the feet, and quarter-ill. In sheep, the ill effects of exposure to rainy weather are still more decided than in neat cattle; in them it produces diarrhœa, affections of the feet, enlargements of the joints, scab, braxy, and rot. *Cold:* Exposure to a moderate amount of cold, and for a limited time, increases the vital energies, and invigorates the organic functions. In excess it has an exactly opposite effect. It then exercises a sedative or depressing influence, inducing slowness of the circulation, feebleness of the respiratory organs, diminished power of generating heat, coma, and death. These are the symptoms which manifest themselves in severe winters, and are seen in all their stages by shepherds, whose pasture grounds are unsheltered, and exposed to piercing cold and scourging winds. *Shelter:* Want of shelter exposes animals to sudden and excessive changes of temperature, and to the heat-abstracting influence of cold currents; it necessitates the consumption of a very large allowance of food, and when, as is usually the case with animals badly sheltered, exposure to cold is conjoined with exposure to rain and all kinds of weather, the necessity for an increased supply of food will be still greater. In such circumstances, an unusually large quantity of materials is expended in the maintenance of the animal heat; and if this extra expenditure be not compensated for by an increased quantity of food the animal necessarily loses weight. Amongst the other diseases produced by exposure to cold, are rheumatism, pulmonary consumption, scrofulous tumours, increased loss of ewes and lambs in the lambing season.

DISEASE OF THE VINE.

BY J. TOWERS, MEMBER R.A.S., H.S. OF LONDON, ETC.

Epidemics have recently become more prevalent, or at least they excite more general attention. The potato-blight established itself throughout a considerable part of Europe in July and August of 1845; the *vine*, however, then appeared exempt from any serious malady, either when growing upon the open wall, or under the protection of glass. The approach of that mildew now so minutely described by several microscopists was little observed till the autumn of 1846, when a phenomenon occurred on a very fine "West's St. Peter's vine," which is judged to be worthy of record. That tree, covered with a capital crop of its most rich, tender-skinned clusters, extended throughout a vinery 36 feet long. Here and there a single *ripe* berry cracked, and in a few hours the edges of the wound were coated with a thick, white mould. Early in October, the crop was fully matured; and at that season it was natural to ascribe the injury to a damp atmosphere. It increased, however (in the face of morning fires and air), and with such rapidity, that several entire clusters, sound in appearance over night, were destroyed by sunrise, and thus in succession, till nearly the whole crop was lost.

At this point it may be well to recal to memory the year 1847, that dry season, when the recorded depth of rain was only 16¼ inches. It was a year rich and abundant in the cereal crops, but painfully noted for the ruinous superabundance of *aphis* blight. The grape mildew was then on the advance, and we began to hear of it, not only at home, upon the vines under glass, as well as on the open wall, but from abroad, and particularly in reference to Madeira and Italy.

Are we then to anticipate the loss of the vine, that fertile tree of *blessing*, which, from the earliest period of recorded time, has been the only pure source of genuine wines throughout the world?

If so, the question that claims attention is this —*Where are we to find an adequate substitute?* It is true that the British "sweets" termed wines are abundantly sold everywhere; but they are for the major part objectionable, being deficient in *grape sugar*, and in *tartar* (the bi-tartrate of tartar or argol); both being natural products of the vine. Grape sugar is easily prepared, and may ere long come into extensive use. Argol, or cream of tartar, thanks to M'Culloch's Scientific Treatise on British Wines, can be advantageously used in every process of domestic or the general manufacture of wine. Extensive practice at home also sanctions the publication of the following observations.

So long as green, unripe grapes were obtainable, they were preferred above every other fruit; but they failing, the best and most natural substitute would be the leaves, tendrils, and young juicy shoots of the vine itself. *Grape-leaf* wine, on the authority of M'Culloch, is little inferior to wine made from the fruit. The leaves of the claret grape of our nurseries acquire a deep purple tint in the autumn, and from the infusion of these in boiling water, combined with juice of the crushed ripe fruit, a very superior red wine has been repeatedly prepared. Among fruits in general cultivation are the damson and black bullace, from either of which, alone, or with the infusion of the claret leaves, a red wine could certainly be made, superior to much of the doctored trash vended under the name of port. The Orleans plum has also been highly spoken of. The juice of *cider* apples, fermented with that of the damson, would form an agreeable, dry, red wine. The list of available substitutes for the grape might be considerably enlarged; but it will suffice to mention the expressed juice of the *giant rhubarb*, which would yield wine in excess, so prodigious is the growth and rapid increase of the plant. It naturally contains the bin or super-oxalate of potash, (often termed "salt of sorrel") and malic acid in combination with lime (*Brande*). The addition of argol would promote the vinous fermentation. The flavour of the wine when completed, and perfected by age in the bottle, is somewhat peculiar; and may, perhaps, be thought somewhat like that of the cocoa-nut.

The great vice of our British wines consists in the superabundance of cane sugar, unbalanced by the natural leaven or ferment of the juice. It thus remains as "a sweet," not convertible in vinous alcohol by age. Hence the insalubrity of such wines.

NEWLY INVENTED AGRICULTURAL MACHINES.

There lately appeared in the same number of one of our contemporaries, two leading articles, the one vituperative of Mr. Mechi as an agricultural improver and teacher, the other defensive of him. The former bears the initials C. W. H.; and is valuable as affording proof, if proof were wanting, of the truth of the old adage, that "two of a trade can never agree." Articles have appeared for several years past, in that journal, with the above initials, the object of which has been to prove that all attempts to yoke the steam-engine to the common plough must be fruitless. The writer argued very justly, and in a style sometimes amusing, though somewhat prolix and discursive, that whatever work the steam-engine performs is performed by a circular motion. As instances, he referred to the paddle and screw of the steam-ship, the wheel of the locomotive, the drum of the thrashing-mill, and the circular saw. Having determined the preference, as he calls it, of the steam-engine for a circular motion, or, as we should say, its superior aptitude for producing such a motion, he proceeded to show that the work of cultivation consists in the *inversion* and *comminution* of the soil, and its *aëration*, as a result of those two processes. It was then argued that this inversion and disintegration may be performed by means of the steam-engine, communicating a circular motion to some undefined kind of machinery, which should produce an effect on the soil similar to that realized by the paw of the fox, the mole, the dog, the rat, or the rabbit, all of which act in segments of circles. By such an earth-rasping machine, the three acts of the farce of cultivation—ploughing, harrowing, and rolling—were to be reduced, we were told, to one.

We never read those articles without regretting that one who possessed so clear a conception of what a steam-plough or cultivator should be, did not go a step further, and reduce his ideas to practice. He might not be a mechanical engineer; but it would have been easy for him to have engaged the professional services of such an assistant. This was the case with the gentleman who has just received from the government four thousand pounds for a patent machine for perforating postage stamps, so as to promote their easy separation, without the necessity of cutting or tearing. It is in evidence before a committee of the House of Commons that he conceived the idea, and availed himself of the paid services of a mechanist for carrying it into effect.

While, however, C. W. H. was satisfied with writing on the subject, and thinking of it till, as he says, it made him "forget his food by day and his sleep by night"—till it became "dearer to him than the smiles of infant offspring, and more solemn and sacred than the silver locks of parental age," others have been up and doing. Samuelson's digging machine, in which the ground is inverted by a set of revolving forks, has been exhibited at agricultural meetings, and has received from practical men quite as much approbation as could be expected for so great an innovation on the experience and practical wisdom of ages, above thirty of them are in actual operation. Ready, as usual, to mount the breach of experiment with the last agricultural novelty, and ready, as usual, to rush into print with his first impressions thereon, Mr. Mechi wrote a letter to the *Times*, in which he declared that a calm and rigid investigation and computation had convinced him that the doom of the plough as an instrument of culture is sealed, and that the rotatory forking, or, as it is wrongly called, digging-machine, is the only profitable cultivator. Even with six or eight horses it is cheaper, he says, and infinitely more efficacious than the plough. He even goes beyond this, and tells us that since the trial of implements at his "gathering," he has received from one of our North American colonies the model of a newly-invented machine, which, by a happy and most simple combination of horse and steam-power, will not only deeply, cheaply, and efficiently cultivate and pulverise the soil, but will, at the same time, sow the seed, leaving all in a finished condition; and will also, by simple inversion, cut and gather the crop. The same authority promises before long to call together a meeting of the various implement-makers, and of his practical friends of the old school, for the purpose of testing the efficacy of this invention. Here, then, we have two more acts of the agricultural farce, as C. W. H. called it, consolidated into one.

These inventors then, and Mr. Mechi, have treated C. W. H., as Sir Robert Peel is said to have treated the Whigs; they have caught him bathing, and have run away with his clothes. Upon this C. W. H. has waxed exceedingly wroth, and declares that though steam cannot be harnessed to the plough, yet as long as horse-power is to be employed in cultivation, nothing but the plough can be used. He ridicules the idea of a rotating horse-power forking machine, as lustily as his own rotating steam-power earth-rasping machine was

ever ridiculed at fair and market and agricultural dinner; and he denies that rotatory forking is either an accurate or an economic application of horse-power, or that, for equine cultivation, it will ever supersede the "specific and demonstrable superiority of the plough."

Taking an unbiassed view of the question, we feel bound to declare that a rotatory cultivating machine, actually at work, though worked by horse-power, is a movement in the right direction, and a step gained towards that more perfect steam-cultivator, which has as yet only been revealed to C. W. H. in visions. It appears to be a bridge, which will enable practical agriculture to cross the gulph as easily as a passing cart-load of stones enabled a friend of ours, whose exploits are all of the Munchausen order, to take a deep lane in hunting, which was too wide to be cleared at one jump.

Perhaps, after all, we may never get beyond an earth-rasping machine, worked by horses. The great difficulty in applying the steam-engine as a locomotive power, to cultivation, appears to be to make its ponderous weight traverse a yielding surface. We fear this difficulty is not easily to be surmounted. If C. W. H. thinks otherwise, why does he not surmount it with the aid which we have indicated? Let him cease to *write* about a steam-plough, or rotatory cultivator, and *make* one. It is not even yet too late; and a rich reward awaits him if successful.

In the article defensive of Mr. Mechi, there is something with which we agree. Our opinion of that gentleman as an agriculturist is well known. As an experimentalist, and one who publishes his operations, we consider that he has at least endeavoured to render some service to agriculture. Though we may not yet be able to place him in so high a rank, he may, if he choose, follow something in the path of the late Lord Leicester. This nobleman never farmed, it is well known, profitably himself; though when his bailiff took the same farm, he made it pay. But Lord Leicester by his example introduced many novelties into practice, quite as great innovations on established usage as any one else has attempted. In the hands of practical farmers, those novelties became profitable; and Lord Leicester's losses on his *farming* were repaid a hundred fold by the *improved value of his estate*, which his experiments caused when they were adopted by his tenants.

In conclusion, we must repeat what we have so often had occasion to remark—that this gentleman's influence would be much greater did he not dogmatize quite so much as a teacher while he is but a learner, and if he were more cautious in calling on farmers to follow his innovations before their merits have been sufficientiy tested.

THE POTATO DISEASE OF 1853.

When shall we have done with the alarms, the theories, the specifics, and with the reality of the potato disease? That it seems to be now, nearly beyond all precedent, serious; that it has assumed even new phases of virulence; and that it has utterly, hitherto, baffled all possible efforts of man—appears to be acknowledged. Science and skill, practice and experiment, seem all set at one fatal defiance. The Potato Commission met, and investigated, and reported; and were as powerless before it as they are before war, famine, and pestilence. Nor does the tendency to disease apparently wear out. If it lies a little more quiescent one year, it is only to break out with renewed vigour the next: if one species of potato is free one season, it is the more severely diseased in the following: nay, it seems as if some vast providential arrangement were at work, specially to baffle the wisdom of man, and to say to his science, his philosophy, and his skill, "Hitherto shalt thou come, and no further!"

The phase of the potato disease of 1853 is peculiar. There are two remarkable characteristics which never before attended it. In all former years, the potatoes raised under glass gave early indications of the disease: on this occasion, there were few, if any, complaints on the subject. The next peculiarity was that, as soon as the stalks became brown and spotted, the disease was ravaging the tubers. But, on this occasion, the stalks were brown, in many cases, for weeks before any manifestation of the disease took place; and it was hoped it had expended its virus in blackening the tops, when the tubers so long escaped. A third peculiarity was, that the crop this year was fully mature before the visitation took place; and hence there was a prospect of a most abundant yield; the disease set in after the heavy rains of September—a time when, otherwise, the plant was assumed to be safe. *But it was not the rain which caused it*, because in many instances, when the potatoes were taken up, and stored away carefully and dry, covered so as to have no evil atmospheric influence—still, on opening the pits or removing the cover, if housed, they were just as bad as if they had been fully exposed. All precedent, all experience, all accumulations of knowledge, all things set at naught, with one fell swoop.

Nor is it peculiar. In the north and south of

England, in the whole of Ireland, and in the generally more favoured district Scotland, the disease seems to have spread, while in Canada it has appeared with great virulence. We have not heard how the small islands of Scilly and the Isle of Wight have this year been favoured, as they have usually escaped in a considerable degree, when others have been sufferers.

In this country the disease has resolved itself into a simple question of the abstraction of so much food—fully thirty per cent. of a very good crop are already gone; but in Ireland the investigation is more vital and stirring. We have before us a report of the meeting of the Chemico-Agricultural Society of Ulster, in which the plan of Dr. Bollman was completely canvassed, with other modes proposed to arrest, if not to cure, the disease.

Dr. Bollman's principle seemed to us by far the most reasonable of all recommended, if the disease were at all inherent from the parent tuber. Dr. Hodges demonstrated the disease to be a fungus, breaking up the structure of the potato; and if there was seminal infection, like the smut in wheat, Dr. B.'s plan of high-drying the tubers was by far the most rational one we know of, especially as extreme dryness is absolutely destructive to the sporules of almost every fungus, and the Botrytes, the peculiar fungus of the potato disease, was unlikely to find a nidus in so highly-dried a set. But if it be first of all atmospheric, as is all but certain, and if the decomposing mischief is *from without*, we cannot see how Dr. Bollman's preparation could be at all effectual.

And so it appears it has failed in numberless instances; and so has peat charcoal, as well as pulling up the stalks, planting in spent tan, and a thousand more similar schemes of prevention.

The only satisfaction which seemed to be held out to the meeting was the plan of Mr. Walkinshaw—no better one than that suggested by the Potato Commissioners sent by the late Sir Robert Peel into Ireland to investigate the disease. He advises the potatoes to be immersed in powdered lime. He recommended the potatoes to be planted in drills—the common method in this country—an alternate ridge to be raised and removed, and a plough sent up to cover over the others with the planted soil thus left; this, he said, he found to be a desirable method, as it protected the tubers both from wet and from frost. He removed the moisture from those taken up by drying with lime. Mr. Evans showed where the disease had certainly been arrested by cutting away the diseased particles and dusting with lime. These may answer for sets, but we do not see in all these researches the least hope of the disease being arrested in its rapid course.

The whole of the facts, however, lead to this conclusion—plant as early as possible, so as to get a large portion matured and sold before the disease sets in, as it usually does with great severity late in August, though this year it was about the middle of September before it became general.

AUTUMN MEETINGS OF AGRICULTURAL SOCIETIES.

There is nothing so embarrassing as an uncertainty. Let a man only know what his fate really is, and if he have anything of the pluck of an Englishman, he will generally be found to make the best of it. The vague promise of better times, and the waiting for what he should have, alone keep him back. His very want of energy may be construed into an argument for a better opportunity. So long as this is coming he does comparatively nothing; so long does he hesitate to make the most of his own resources. The agriculturist for too lengthened a period had been in this equivocal position. Fortunately for himself, he now knows his fate, and, as we should have expected of him, meets it like a man. He not only, too, knows the worst, but even hopes for something still. This something, however, must come of his own exertions; and thus, with the certainty that whatever opportunity he may enjoy will be chiefly of his own finding, he prepares to find it accordingly.

The autumn meetings crowd upon us. It would be impossible to find room for a tithe of the reports with which we are favoured. From almost all these, moreover, it is encouraging to see how ready and anxious both landlord and tenant are to make the best of it. There is scarcely a speaker but has some practical suggestion to offer, or some strong point to impress, that must tend to the further advance of British agriculture. The new lights are met with their own weapons, and challenged to do more than the old watchman sort they have been so long ridiculing. The devil, too, has hardly turned out so bad as he was painted; and while we feel that we must do all we can, the conviction is accompanied with the hope that this may not be without some proportionate return. What we require is a clear course and a fair start. We may cull from the many addresses before us that which just now is considered amongst the most necessary means to this end. We want to make the certainty, now it is come, as definite a one as possible, and

have the position we take at least clear to ourselves. To accomplish this, we come on a subject that has been revived with some advantage during the last few months, and that looks like working into more general use the more it is considered. At the Stirling meeting, Mr. Cardwell, a gentleman of some authority in what he undertakes, thus touches on it:—

"Your Chairman has been kind enough to refer to a subject on which I wish to say one word. I mean agricultural statistics. If science be useful in its application to manufacture, knowledge is useful in its application to trade. No man can carry on the various departments of trade unless he knows the market in which he is to buy and sell; it is, therefore, our interest to procure accurate agricultural statistics. The farmer goes to market, and his business is to be informed of the state of that market at a reasonably early period; and it is the interest of that farmer that accurate agricultural statistics should be obtained. By the aid of the Highland and Agricultural Society of Scotland—and I am bound to bear testimony to the labours of their excellent secretary, Mr. Hall Maxwell—by the aid of that society, we are now in a fair way of procuring such statistics, and through them we have seen whether the excellent farmers of Scotland do or do not appreciate these statistics. An experiment has been tried in three counties in Scotland, only for the purpose of ascertaining whether we could obtain such statistics. It was my part to lay these on the table of the House of Commons; and allow me to say that the intelligence is very manifest in the answer made to that experiment. With scarcely any exception, the owner of every tenement has responded to the call; and consequently, without any exception, the agricultural statistics of every tenement in these counties is known to the Highland and Agricultural Society, as the result of that experiment. The results are laid upon the tables of the Houses of Parliament, and are circulated for the use of the farmers. As to England, a like result will, we hope, flow from a like experiment."

At the Northampton meeting, again, Mr. Stopford, the chairman of the day, made the same point the chief feature of his speech:—

"Though the farmers were enjoying a share of prosperity this year, next year they might not be so prosperous. None were more subject to ups and downs, and they had therefore to take the average of a series of years in calculating their prosperity. With reference to the produce of the land, it was unfortunate that they had no means of judging before this time next year whether they should then be in want of great importations or not. As a means of obviating this, their meetings should assume a more commercial character, and, as a first step, they should try to discover the probable supply and demand. Connected with the first, could any one give him the least idea what the price would be next year? They could not, for they did not know the amount of stock and the number of acres grown this year. If they did they might arrive at some definite conclusion. From a paper that came into his hand the other day, he perceived that their northern brethren were endeavouring to do so, and he thought their plan worthy of imitation here. The return was made up by the Scotch farmers themselves, but did not contain any particulars as to names. If they had a return of that sort, together with another showing the corn thrashed out, they would have something to go by. He could not help thinking such statistics would greatly benefit the whole body of farmers. An instance of their necessity was shown by the French having at this period of scarcity anticipated them in the markets, and they should suffer much disadvantage in consequence."

Another chairman, Mr. Hoskins, at Cockermouth, in the absence of the county members, thus sketched out what we might yet expect them to do for us:—

"He might have suggested to them what was partly promised some time ago, and seemed almost upon the point of being carried into effect at the very close of the session—the establishment of some general system of collecting agricultural statistics. He was glad to observe that sentiment met with approval, and it really did seem very anomalous that whilst the manufacturer could base all his operations upon calculations formed upon sure data, the agriculturist, who was now universally recognized as in no way deficient in intelligence and skill, should have no sound system upon which he could form correct data in order to know whether he should hold his crops or dispose of them at once. Now that the nation was in such a prosperous condition, and that all parties had at length united in one 'happy family,' he thought the ministers of the day should do their duty, by furnishing the agriculturists with a proper system of statistics. He saw no difficulty about it; other statistical returns of a far less accessible and complicated nature were constantly being made—even to the ages of their wives and daughters, which, as every one knew, was no easy matter, and he could not conceive why there should be greater difficulty in ascertaining the state of our crops, especially when every intelligent farmer was fully aware how important it was to his posterity that it should be furnished."

It is but right, however, to say that this is not quite an unanimous opinion. At the Whitehaven Meeting, which followed the Cockermouth, Mr. Irton comments in this wise on "the first" of the suggestions proffered at the preceding gathering:—

"As to the first there was a certain department of the Board of Trade which would, on application, satisfy the inquirer as far as they could on that point; but they all knew how reluctant farmers were to afford such information to the proper authorities, and it was believed by many that the publication of such statistics would be more prejudicial to their interests than if none were in existence."

We think we may venture to say that farmers are gradually growing out of the short-sighted reluctance here imputed to them; at any rate their own evidence at many a meeting amongst themselves tends so to assure us. As regards the information we at present possess, it is to be lamented that Mr. Irton did not go a little further, and tell us *how far* the Board of Trade could at present *satisfy* the inquirer. We should be inclined to rank the applicant amongst those easily pleased.

At this same party, Lord Lonsdale is all for improved breeds of stock and the further use of machinery. At Cockermouth, Mr. Steel—

"If he took up a newspaper, or asked the prices at a market, he found that one man told him that grain was so much a load, so much per boll, or so much per sack; so that it was impossible, unless he carried a rule-of-three table and ready-reckoner in his pocket, to ascertain what were really the market prices except in his own county. Therefore he thought that all weights

and measures should be put on such a system and reduced to such denominations as should make them universally understood throughout the country. He did not know what a 'boll' was; if they told him so much by the Carlisle bushel, or by the quarter, he knew what that meant; but how was he to be familiar with all the various denominations used in different parts of the kingdom? Therefore he would suggest that the borough members, with the county members, should stimulate the Government to revise the laws of weights and measures, and to put in force a more regular and more reasonable system throughout the kingdom. In Smithfield market they said so much to the stone of 8lbs., but here the stone was 14lbs."

Coming south, we find Lord Bateman, at Hereford, talking good sound sense on the labour question—

"It had become one of considerable importance, and he urged them to be very cautious how they used their servants. It would not do for labourers to find out that prices were high and wages low. The labourer's hands were as much his capital, on the produce of which he had to live, as his (Lord Bateman's) estate was his, or a tenant's farm his; and though inclined to deprecate the system of strikes, he could not blame men who, feeling that they had a grievance, united for its redress. To avoid a strike amongst agricultural labourers, farmers must show a liberal spirit—not screwing their men down, but allowing them to share in the present prosperity."

Mr. Booker, the Protectionist M.P. for this county, "congratulates his constituents on the altered circumstances of the times." Another member of the same honourable House, Mr. Wilson Patten, at Fylde, "believed it was the duty of every landlord to make agricultural experiments; and then the tenant-farmers, when these had been thoroughly tested, would be in a position to know whether they should adopt or reject them." At Leighton Buzzard, on the other hand, Mr. Thomas, a tenant of the Duke of Bedford's, is very hard on "the conceited Cockneys" who come from behind their counters to dabble in amateur farming. In Essex they are trying still to bring this amateur business to the proof; and we have William Hutley following every turn, and analyzing every whim of the ingenious Mr. Mechi. This is at Witham. Close by, we have another agricultural gathering, of rather a different character. Here, at Hinckford, they yet try to make the worst instead of the best of it; Sir John Tyrrell, in the spirit, if not in the flesh, crying like the spoilt child, for he doesn't know what, and determined to have it. The worthy baronet's logic is very good:—"The Conservative party is completely demolished in the House of Commons as a party;" here is something to regret; but at the same time it may be consolatory to know, though, "it *is* a deplorable state of things that we have a Cabinet composed of statesmen without a party."

Are not the days of "party" gone, Sir John? And must not the farmer and his friends rub out the line that has so long divided them, and make the best they can of it? If we press the question we shall have Hinckford in a minority.

AGRICULTURAL STATISTICS.

Considerable progress has been made this year towards supplying one of the most serious *desiderata* of our social economy. The Board of Trade have procured, and already published, the agricultural statistics of three Scotch counties—Roxburgh, Haddington, and Sutherland—for the 20th of last May, and have taken steps to procure the same returns in two English counties—Norfolk and Hants—for the 10th of last July. Nothing can be more easy than such returns, and the only wonder is that, considering their importance, they have not long formed a regular part of the statistical information annually poured on the country. Every year the probable results of the harvest are a matter of frequent inquiry, and some conjectural estimate of them is necessary to all kinds of speculation. These estimates are made commonly on the strength of private reports and correspondence in agricultural journals; they are often received with suspicion, and sometimes discredited by the event. The truth is, that the circumstances affecting the aggregate produce of the country are too various to admit of a near calculation. Unfavourable weather is never universal—often very partial; and of course the same quantity of rain will affect light soils and heavy soils very differently. A bad sowing time, a bad summer, and a bad harvest time will produce very different results. This year, for example, there has been an almost uniform decrease in the breadth of land under wheat, and the summer has been almost uniformly unpropitious, while the harvest time has been much more favourable in some parts of England than in others. Then the poverty of the farmers, and the discouragement they had suffered by the low prices of previous years, have their several effects. We defy any man to form a correct estimate of the quantity of wheat and other produce to be expected in this country from the provincial reports, well-informed and honest as many of them are. As we have said, however, there is no kind of speculation—whether it be railways, shipbuilding, cotton-spinning, or buying and selling in the funds—which will not be materially affected by a rise or fall of 20s. a quarter in the price of wheat. Yet, while information of all kinds is accumulated on our tables and shelves far beyond the power of human industry to peruse ever so cursorily, no means are used to tell us and our merchants what sort of harvest we may expect, and even so late as December those who are more immediately interested in asking the question have no other resource than to ride through the country, look at the rick-yards, listen to the thrashing machine or the flail, visit the country markets, and read the provincial papers.

The new inquiry is made by the Board of Trade, in Hampshire through Mr. Hawley, and in Norfolk through Sir John Walsham, both of them Poor Law Inspectors, and having, it is to be presumed, rather less to do in that office than a few years ago. These gentlemen communicate, in the first in-

stance, with the chairman of the board of guardians, whom they request to form small statistical committees, consisting of leading agriculturists, whether Poor Law guardians or not. This use of the Poor Law machinery, it is unnecessary to say, is made with the sanction of the central board. The committees employ the relieving-officers (or enumerators), and send them with letters of recommendation to the officers and occupiers of land in each parish. By this chain of organization there are distributed to all occupiers holding as much as two acres of land forms containing the required heads of information, and capable of being filled up in five minutes by any person of ordinary intelligence. The forms so filled up are to be collected and classified, so as to give the aggregate results in an intelligible shape. There are, in fact, two returns to be filled up—one of the land under cultivation, severally for wheat; barley; oats; rye; peas and beans; tares or vetches; potatoes; turnips or rape; carrots; mangold-wurzel or beet-root; cabbages; clover; lucerne, or other artificial grasses; meadow or pasture; flax; chicory; hops; other crops and fallow: the other of live stock, divided into horses, milch cows, other cattle, sheep and lambs and swine. When one considers how easily any farmer, whether he holds two acres or two thousand, can state the number of acres under these several crops, or the number of his live stock, and how easily also the information can be collected and arranged by existing officers, now very much at leisure, we only wonder the inquiry has not been made before, and we should hope it will become universal. The French, and even the Americans, with their immense and thinly-peopled territory, have made similar inquiries, and the result is thought to have the effect of aiding merchants in their commercial transactions, and preventing much wild speculation. At this moment there is the widest discrepancy of estimate as to the quantity of wheat and other corn in the land. We have been told, by a very simple, impartial, and unsuspected authority, that the land under wheat has been less this year by a fourth, owing to the bad seed time, and that of these three-fourths the yield will be not much more than half the average. If this be near the truth, we see at once that there would be reason to dread the approach of a famine, were it not that England is now the granary of the world, and the reports of her Corn-exchange will give fresh activity to myriads of agriculturists and sailors employed in getting together and bringing to these shores the produce of all climes.

Undoubtedly, the publication of such statistics, on the best possible authority, viz., that of the farmers themselves, under the eye of local officers, will remove somewhat of that uncertainty and ignorance which now injure the agriculturist, and transfer much of his legitimate profits to other classes. The simple fact of only three-fourths of the usual quantity of land having been sown with wheat this year would of itself have opened the eyes of the public somewhat earlier to the dearth now coming upon us, had it been only placed beyond doubt. Wheat has been rising rapidly for the last four or five weeks; but, as late as the week ending September 3, the average was only 50s. 4d., perhaps 20s. below what it would have been had the agriculturists and corn-dealers possessed such means of information as those which the Board of Trade is now making an attempt to provide. It is most important, with a view to the proper supply of our wants, that our merchants should know the probable deficiency at the earliest possible date. When dearth begins to show itself late in the year, foreign states immediately do all they can to retain within the shores all the corn that happens to be there, whether native or imported. At this moment a great part of Europe is closed against us. Now, had the present state of things been foreseen in the summer, we should undoubtedly have placed ourselves beyond the influence of all illiberal measures, by drawing towards this country a much larger importation even than what has taken place. Possibly we should have secured within the port of London a good deal of the grain now spoiling in the enormous fleet which the barbarous policy of the Czar has accumulated in the Sulina mouth of the Danube. The statistical experiment can only fail, and that only for a time, by the incompetency of the officers employed, or the reluctance of farmers to give evidence which they may fear to find used against them. In a year or two the proper course will be ascertained, and the information procured in as authentic and copious a shape as any of the miscellaneous and often unprofitable matter that swells our blue-books to such huge proportions. We need scarcely repeat how much more useful we think the information will be in this instance than in some others we could mention.—Times.

AGRICULTURAL STATISTICS.

SIR,—In furtherance of the object you have in view, by calling public attention to the great importance of agricultural statistics, I will venture to name a simple fact which may have some weight in arousing the slumberer.

Since May last, wheat has risen in value 20s. a qr., barley 10s., and oats 4s. Now it is assumed that we consume in this country about 20,000,000 qrs. of wheat annually, probably about half that quantity of barley, and a like quantity of oats. From this simple fact we see that the enormous sum of £27,000,000 annually is by this process diverted from one channel of commerce into another, and this has taken place not by degrees, but in the short space of five months. If we go further back, we find the difference of price still more; and this additional charge is not optional but compulsory. It is equivalent to more than doubling the expenditure of the country—it is equal to another national debt. A war with Russia would cost us less. It is therefore impossible to overrate the importance of these changes, and every effort ought to be employed to mitigate such an evil, and very much would be effected by an accurate knowledge of how far we could depend upon our own produce for the supply. This information good agricultural statistics would afford.

I would venture, therefore, to suggest a very simple mode of arriving at the state of cropping and the crops. The Ordnance are preparing for publication maps, some of which are already published, in which every enclosure of whatever nature, even to a pump, is marked. Now it would be a very easy matter for any intellectual and active man to take a district, one of the squares say, and by going to every field collect the information required without asking any questions, and a person practically acquainted with agriculture would make a very fair estimate of yield at the same; a few days would suffice for the performance of this work, say from the 1st to the 10th of July. This could be done wholly independent of the occupier, and would be more accurate in the result, since there would be no prejudices to deal with. Where the Ordnance survey is not completed, or does extend to the *minutiæ* which it does in the north of England, there is always

a map attached as award for tithes, or a survey for some other general or public purpose that could be obtained. The contents of each field being once registered, would for all future purposes be referred to by a number, as is usually the case. This would certainly be the simplest and most efficient way of obtaining an account of the cropping and crops. Returns by farmers being also made, one would be a check on the other.

I am, sir, your obedient servant,

Pickering Lythe, Oct. 20. A FARMER.

P.S. As you, sir, are the avowed advocate of the labouring classes, who are more intimately affected by this subject than any other class, I will venture to draw your attention to the fact, that during the interval alluded to—from May to October—though wheat has risen in price 40 per cent., household bread in the metropolis, as elsewhere, has risen 50 per cent., namely, from 7d. to 10½d. to 4lb. loaf; and at the enhanced price is not, and never is, of so good a quality as it is when at the lower quotation. Had we known what our state of cropping was, and the probable yield, even so late as July, much of the present excess of price might have been mitigated by the increased exertions of importers. The 4lb. loaf was then only 7d.

PRICE AND ITS CONSEQUENCES.

Farmers, although agriculture is their profession, are yet almost as much dependent upon commerce as merchants, and as much subject to her laws. The sub-division of labour into three branches—*agricultural*, *manufacturing*, and *commercial*—may be scientifically correct, as it doubtless is; but the sub-division of the public into three parties—the *agricultural*, *manufacturing*, and *commercial*—is obviously otherwise, and has therefore been very justly condemned of late by political economists; for price is a commercial question, and who are more subject to it than farmers? A very large amount of their labours are either manufacturing or commercial; for they manufacture a long list of *et ceteras* into manure, manure into crops, and crops into dairy produce and butcher-meat, for market; in all of which price forms a very important question; indeed, price is proverbially the first question in agriculture.

If, for example, the produce of crop 1852 be estimated, in round numbers, at 20,000,000 qrs. of wheat (an estimate which we take for the sake of easy calculation), and if we further suppose that it was sold at 50s. per qr., then its total value would be 50,000,000*l.*; barley, including bere, 10,000,000 qrs. at 30s., 15,000,000*l.*; oats and rye, 35,000,000 qrs. at 20s., 35,000,000*l.*; beans and peas, 3,000,000 qrs. at 33s. 4d. 5,000,000*l.*; potatoes, clover, tares, flax, &c., &c., 45,000,000*l.*; butcher-meat, dairy produce, poultry, hops, wool, &c, &c., 100,000,000*l.*; tabularly stated, thus—

Wheat	20,000,000 qrs. at 50s.	£50,000,000
Barley	10,000,000 ,, at 30s.	15,000,000
Oats and rye	35,000,000 ,, at 20s.	35,000,000
Beans and peas	3,000,000 ,, at 33s. 4d.	5,000,000
Potatoes, &c.		45,000,000
Butcher-meat, &c. &c.		100,000,000
Grand total		£250,000,000

Such being its value (crop 1852), we have next against it, on the opposite side of the ledger, the several folios under expenditure, including interest on capital, which we shall tabularly state thus—

Servants, labour, &c.	£50,000,000
Rent, rates, tithes, taxes, &c.	70,000,000
Interest on farmers' capital, 300,000,000*l.* at 12½ per cent.	37,500,000
Tradesmen's accounts, including manure, &c.	50,000,000
Farm horses, &c. &c.	42,500,000
Grand total	£250,000,000

These figures can only be taken as very distant approximations to the truth. Mr. M'Culloch gives the annual value of the agricultural produce of the three kingdoms, thus—

England	£141,106,857
Scotland	27,744,286
Ireland	48,200,834
Total	£217,551,977

And since the period such statistics were taken, the quantity of produce has obviously increased; but, be that as it may, the above data are only given for the sake of illustration; and how they are affected by price we shall now show.

The wheat crop of the present year (1853) is, according to general testimony, one-fourth deficient; so that, instead of 20,000,000 qrs., we have now only 15,000,000 qrs.; query, therefore, how are we, under such circumstances, to balance our accounts?

The obvious answer which commerce gives to this question is to *advance the price*; but when we come to the more important part of the solution, involving *how much*, the answer is by no means an easy one to reduce to practice; for the moment we advance the price of wheat, up gets a thousand accounts on the opposite side of the ledger—as, for example, if we advance the price of wheat from 50s. to 66s. 8d., then 15,000,000 qrs. at the latter price will return £50,000,000—the value of 20,000,000 qrs. at the former. So far is simple in theory; but, in practice, when we advance wheat 16s. 8d. per qr., servants will be looking for an advance of wages equivalent to it, or say 30 per cent.; consequently, instead of the above item of £50,000,000, we have now our labour account advanced to £65,000,000. Again, tradesmen's accounts also get up, in order to meet the increase of their expenditure, so that we have some £15,000,000 more to add to their folio, making it £65,000,000, instead of £50,000,000. These two accounts added together would make a total increase of the farmer's expenditure of about £30,000,000, which would only leave £7,500,000 as interest on his capital. His object being to secure 12½ per cent., or any fair per-centage which may be allowed him in the absence of our hypothesis, it is manifest that a greater advance must be made on the debtor side than 16s. 8d. on wheat before he can do so; and it is equally manifest that the whole advance

cannot be fairly made on wheat, for twice this sum in addition would only amount to £25,000,000, being £5,000,000 short of a sufficient rise. It would take an advance 56s. 8d. to balance the above increase of expenditure, making the total price of wheat 106s. 8d. per qr.! In short, the £30,000,000 increase of expenditure must be spread over the other products of the farm—a proposition which the public is now experiencing as being reduced to practice; one which is further involving us in all the anomalous consequences arising from a difference of price, as we shall by-and-bye show.

We cannot, however, by any reasonable means secure to the farmer this year full interest for his capital. A general loss has been sustained, and he obviously is the first party who will be called upon to pay his fair share of it, which brings us to the grand question at issue, viz.: Britain having sustained a loss of 5,000,000 qrs. of wheat, or £12,500,000 stated in money, taking 50s. as the average and fair value per qr., the grand question at issue is to make each of her inhabitants pay his fair share of it, and no more.

A deficient crop is, doubtless, a national dispensation of Providence, which must be publicly borne. It would be madness on the part of any nation to think of shuffling such a burden from off its own shoulders upon its neighbour's; but when we come to the case of individuals, it is almost all shuffling together, each endeavouring to bear as little of the burden as possible, while not a few are even contemplating making fortunes (?) through the instrumentality of famine prices at home entailing upon the nation a much greater loss than it has actually sustained. Consequently there are others who must bear much more than their own share of this dispensation. It is, therefore, not only a national calamity which must be publicly borne, but one which entails upon the public consequential losses equivalent to or little short of the loss itself, as will more practically appear from the next paragraph.

With a deficient harvest, labour and capital are unequally yoked; for if we suppose that Government procures 5,000,000 qrs. of wheat, presents it to the farmers gratis, and then puts a tax of so much per head to cover the purchase price, then no increase of price would be necessary to balance the national farm account. The only loss then sustained being this head-tax of £12,500,000, labour would only have to give the equivalent of this sum in extra work, to procure the daily necessaries of life undiminished in quantity. But when a distribution of the burden is left to be settled according to the ordinary laws of commerce, or rather, perhaps, course of things, it is very different; for the farmers have no alternative but to advance the price, when up gets price on the opposite side of the ledger, in order to make the farmers themselves pay their own share of the loss if not something more; so that before we get our supply of foreign wheat we publish our misfortunes, shouting "Famine" and "Starvation," until we probably pay 60s. for it instead of 50s., entailing thus upon the nation a loss of £2,500,000 on the 5,000,000 qrs., and probably £5,000,000 more on our other imports! Hence the extra loss sustained amounts, according to this calculation, to £7,500,000! British industry has therefore to give foreign farmers £7,500,000 over and above the ordinary value of £12,500,000, or £20,000,000 for her deficient harvest of wheat—amounting to 80s. per qr. This is certainly not saying a great deal for British commerce, and unfortunately it does not even exemplify the whole facts of the case, for it has only reference to the public position of national labour, while its private position is much worse situated; for individual burdens are far from being equally borne, while they are greater *in toto* than £20,000,000. We have already estimated the increase of expenditure at £30,000,000 by agriculture alone, while in the other branches of industry it is probably greater. In short, the derangement of the whole industrial system, and consequent loss sustained, are scarcely credible, and will take some time before things are restored to their original state of prosperity.

More work must be done, and the task is to get parties to put their shoulder to the plough. Either England must perform more work this year, or submit to a degree of privation. This latter alternative cannot be accepted; hence the soundness of our proposition, and hence the theory of extra price. Now the theory of extra price is simply this:—Capital is an accumulation of past labour in reserve, and the proposition of Commerce is to draw upon the past and give the future credit for the price of the 5,000,000 qrs. of wheat (£12,500,000); but when we come to draw upon the pockets of the million, the major part are unfortunately empty, and the parties neither willing to submit to the one or the other of the above alternatives. They advocate an advance of wages without an increase of labour; hence the injustice of strikes to cover national losses of this kind. Those of the labouring population who have any spare capital by them are a parsimonious party, and neither very willing to draw upon the past or credit the future, and therefore adopt the mean between the two extremes of pinching a little on the one hand, and working a little harder on the other, where practicable. In the upper ranks of life, again, the world of wealth, where there is a reserve of past labour, the parties who are willing to give the future credit are overdrawn upon by those who contemplate making fortunes, as well as by the labouring classes and others who wish to pay none of the loss at all; while a large party have it in their power to reduce their establishments or demands, who have not capital on hand, or who are unwilling to part with it, so as to maintain their expenditures at their ordinary level, and do so; thus adding to the misery of the labouring classes, many of whom from improvidence would require extra work. Hence the many conflicts at present experienced between science-practice and mercenary parties with a command of capital, who are deranging the whole monetary and industrial systems with their speculations. And here we may observe, to silence objection at once, that it matters not whether those speculations are well founded or not, if they are improperly carried out. That we want corn for instance this year, no one denies;

and that it is prudent to lay in a store of foreign grain is equally plain; but why publish our misfortunes? why raise foreign corn, and give £7,500,000 more for it than should be given? And why increase the price of the poor man's bread more in one month than what he ought to pay altogether during the twelve? It is incongruities like these which stamp upon our commerce that character so loudly complained of at present by the political journals.

If the deficiency of 5,000,000 qrs. of wheat were equally divided among the whole population of Britain, it would not entail a loss of more than 10s. per head, estimating wheat at 50s. per qr., and making a sufficient allowance for interest on the increase of capital required to procure a foreign supply. And if we suppose that there are five members in every family, then the loss of each would be 50s. In other words, the present deficient crop entails a loss or debt of 50s. upon every labouring man who has five members of a family, including himself. Now, every labouring man, whatever may be the sphere in which he labours, ought surely to be able to perform an extra quantity of work, so as to pay off *one shilling weekly* without any advance of wages, even granting that he has not a reserve of 50s. in his pocket, as he ought to have. In 1847 we advanced our servants' wages 2s. to 4s. per week, but this was not equivalent to the advance of prices, for each had nevertheless his full share of the national loss to sustain, and something more. The deficiency of that year was about equal to that of the present, and the labourers would have been much better off had they paid off the deficiency by a shilling per week without an advance of wages than with the advance which they received; while with an increase of price no more than would have entailed this extra task upon the labouring man, the interest of capital invested in agriculture would not have been less. No doubt, some farmers endeavour to evade an advance of wages and tradesmen's accounts by reducing their orders; but this is short-sighted economy, only putting the burden of one year upon the shoulders of its successor—a course which always tells its own tale in the long run. It is an old saying, that "dear years never make fortunes for farmers' daughters;" and this year will prove it, as many have done. The rents of landlords and profits of tenants must always be considered the mean between two extremes, and it is during ordinary years that the latter make money, if any at all. The friends of the farmer and labourer are many, but too often those of Job, in reference to prices; but one advice may safely be given to both, and that is, *to make good years cover bad.* No labouring man ought to be in circumstannes so depressed as not to be able to meet the demands of a bad year. In cheap years, like the last four or five, he ought always to be able to make provision for bad ones like the present; and our labouring population will soon be in such a position, and are inexcusable if by improvidence they do not so provide.

When any kingdom is visited by a dispensation of Providence such as that which England and France now experience, the very idea of making fortunes in the corn trade at the expense of the public is of itself unpardonable, being nothing less than a new edition of the old story—"*This man sold his country for gold.*" That many attempts have been made, in all ages of the world, has only afforded statesmen, priests, and poets an opportunity of justly condemning the practice at issue; and that few fortunes have been made, is an interesting proof of the soundness of our proposition. The public is daily becoming more unanimous in its determination to put an end to speculation in the daily necessaries of life, through the instrumentality of agricultural statistics, private companies, and travellers or commission agents. So long as prices remain above an average in England, as they generally are, it is the interest of all the kingdoms of the world to give us their surplus corn at our ordinary prices; and the years are few and far between that the earth has not yielded enough and to spare for all its inhabitants, for seed time and harvest are promised and sure.

So much for price and its consequences. We have seen that a bad crop is a national loss, which must be publicly borne. If a merchant sustains a loss, his prudent course is not to publish it, but to strive by every honest means in his power to procure goods as usual to supply his customers. So is it with nations. Now, if agriculture has this year lost by the deficient harvest £4,000,000, and manufactures and commerce £8,000,000, the prudent course for parties is to make up their minds to sustain their respective losses—agriculture to debit her produce £12,000,000, and manufactures and commerce to debit the goods of agriculture only £4,000,000 instead of £30,000,000, on the former £8,000,000 and the latter nothing. Parties will find this the most profitable course in the end, for speculative prices disorganize the whole industrial fabric, taking several years before it is able to recover itself.

ON THE CHOICE OF BROOD MARES.

Sir,—There can be no doubt but that the breeding of horses of a superior description would amply repay those farmers who are possessed of the requisite knowledge; and whose farms present a suitable combination of light, productive, arable land, with pasture of good quality. The price of first-rate horses has advanced in a remarkable degree of late years, and is not likely to decline so long as the country enjoys an ordinary degree of prosperity. It is everywhere matter of complaint among buyers that good horses never were so scarce as at the present moment; and the man who is possessed of a weight-carrying hunter, or a fine carriage-horse, will, if inclined to sell them, not find himself long without a customer. Still, notwithstanding these inducements, the breeding of horses on a large scale is confined to a few districts, of which the principal are the east and part of the North Riding of Yorkshire, Lancashire, and part of Northumberland. On the Yorkshire Wolds it

is a pleasant sight to see, field after field, with its half-score of handsome colts; some of them adapted for the chace, while others are destined for London carriage-horses. Though not so plentiful as I remember them twenty years ago, especially the higher bred ones, they are still to be found in sufficient numbers to show that the farmer considers them a portion of his stock productive of profit, and consequently worthy of attention. Even there, however, breeders might with advantage propose to themselves a higher standard, and aim at producing hunters of the first class, which would surely remunerate them better than the leggy and somewhat underbred coach-horses which are every day less suited to the requirements of customers. One reason why hunters are not bred there so extensively as in former years, is that farmers, either tempted by the high prices offered by foreigners, or under the pressure caused by agricultural distress, have, from time to time, parted with their best brood-mares. Much as it is to be lamented that either good mares or stallions should ever leave the country, there are nevertheless abundance remaining from which to rear, with judicious management, a valuable breed of young horses. In the hopes of affording some encouragement to the extension of this important department of agriculture, I offer the following hints:—

One of the most important elements of success is the choice of brood-mares. Never breed from a mare which is not well bred. By well bred I do not mean having many crosses of blood; for many mares, nearly and even quite thoroughbred, are very undesirable animals to breed from. A well-bred mare, in the true sense of the word, is one of which the progenitors, for many generations back, have been carefully selected. In this respect Yorkshire breeders possess a considerable advantage over those who reside in districts where breeding is less extensively carried on. In the former county it is easy for a farmer, even of moderate means, to procure mares which are above the suspicion of being tainted with cart-blood. Owing to the abundance both of thoroughbred and "nag"* stallions, a roadster-mare is seldom or never put to a horse of inferior stamp to herself. Thus, with little or no trouble or cost, a class of mares is in the hands of Yorkshire farmers which elsewhere it would require much expense and research to gain. With but little of outward show to recommend them, they breed excellent hunters, when put to a suitable thoroughbred horse; whereas mares of similar appearance in other countries would only produce stock fit for harness—if, indeed, they were good for anything. The reason is, that in the latter case the cart or other inferior crosses would reappear, and thus baffle the calculations of the breeder.

Perhaps mares such as the Yorkshire farmers use are, on the whole, the safest for the agriculturist to breed from. Although not so high-bred as some others, they are less expensive to purchase, and require less judgment in their choice than those of a more ambitious character. They possess one recommendation which the farmer should never lose sight of—I mean power. Let his object be to produce a colt which, if it fails as a hunter, will be useful in harness; or, if some accident should unfit him for fast work, will at any rate take his share of work on the farm. I know no better test of success than this, viz., that the colt which loses a portion of its conventional value, should yet retain its real usefulness. Always make strong, well-set-on fore-legs a primary object. They should be placed forward, so as to be an efficient support to the animal; and the shoulder ought to stand backward, in order to allow the legs liberty of action; but it must be somewhat round and full, not thin and confined, which some persons conceive to be a *fine* shoulder. Never breed from either mare or stallion with a decidedly bad shoulder. An animal may dispense with almost every other point of excellence, and yet be of some value; but if it has a bad shoulder, it bears so thoroughly the stamp of worthlessness, that nothing else can make amends for this fundamental malformation. If your mare is tolerable in her shoulder, but not very good, endeavour to find a stallion which is particularly excellent in this respect. The forelegs and shoulders being right, action usually follows. But this being a very important point, do not take it for granted, but subject it to your strictest scrutiny. For my own part, I almost think as highly of action in a horse as Demosthenes did of it in reference to an orator; at any rate, not even the most fabulous combination of beauty, breeding, temper, and shape, would induce me to buy a horse which did not possess it.

The foot ought to be taken up straight, by a graceful bend of the knee, and set down again flat, without any deviation either outwards or inwards. The most common faults of action are a sort of shovelling movement forwards, with the knee almost straight, and a sideways motion, either outwards or inwards, with one or both feet. But it is quite possible for the knee to be too much bent, and the foot to be apparently pushed backwards when taken up instead of forwards, thus causing it to be set down too near the place whence it was raised. Objectionable, however, as such stand-still action may be in a hack, I should prefer it in a brood mare to the opposite defect. The great reason why action in the mare is so essential is, that she having the roadster blood, ought to supply it; whereas, it is not always possible to find it in a stallion: it is, indeed, very rare to see a thoroughbred horse whose action is such as would be desirable in the park hack, the roadster, or the hunter. The racing man cares not, provided his horse's head is seen first at the winning-post, in what form he moves his fore-legs. The qualities which win fame for the racer are speed, endurance, and pluck. The conformation most conducive to speed depends more on the back, loins and hind-legs than on the fore-legs; it is therefore by no means uncommon to find horses, whose performances on the turf have been above mediocrity, with fore-legs such as would not wear for three months on the road, and with action such as no man would willingly endure in his hack or his hunter. Thoroughbred horses, with every point such as the breeder would

* A "nag" is a roadster. He is less in size than a coach-horse, and better bred.

desire, combining power and beauty, equally excellent in their fore-legs, their ribs, and their hind-legs, are not to be met with in every neighbourhood, and even when found will seldom cover half-bred mares at all, and then only at exorbitant prices. These are the magnates of the stud, which will not condescend to mates of descent less illustrious than their own. If, then, you cannot secure their services, you must avail yourself of the best within your reach. Supposing your mare has the fore-legs of the action which I have recommended, you may safely put her to a horse which has tolerable fore-legs, provided he is in general power, in pedigree, and in performance such as you desire. I mentioned in a former letter that I once put some mares of my own to "Tom-boy:" his fore-legs were by no means first-rate, and his front action was decidedly scrambling and bad; but my mares being excellent in both those points, their stock showed no traces there of their sire's deficiency. To breed colts with bad fore-legs and insufficient bone, is to encumber your land with stock neither useful nor saleable. With mares of first-rate excellence in that respect, you greatly extend the range of stallions which it is safe to put to them.

I shall not enlarge upon other points of the mare in detail, for the reason that their selection may in general be left to the discretion of the breeder; and also, because there are many of them which in practice will be more frequently supplied by the horse than the mare. I must say, however, that I should not like to breed from a mare with a bad head or a small eye. Natural soundness, especially in the feet, is very important, and so is good temper. With mares, as with cows and ewes, there is a certain character difficult to describe, but which the experienced breeder knows by instinct, as belonging to those likely to produce good stock. It is not the largest, or the most showy, but those which have a certain refinement of form, and a gracefulness of outline (which are as characteristic of the well-bred female as power and muscle are of the male), which will most faithfully reflect in their offspring their own merits, and those of its sire. Many a large, showy mare, on the contrary, will be provokingly uncertain in her produce; one year bringing a foal as much undersize as next year it is overgrown. Such a mare ought to be discarded as soon as possible.

By observing the course which I have recommended, farmers who exercise ordinary judgment will make as safe an investment as they would in the breeding of any other kind of stock. Their colts will make either hunters, carriage-horses, or hacks, of a useful and powerful kind.

There is a class of mares much higher than that which I have described above; I mean those which combine great power with a pedigree little short of thoroughbred—mares which have in their youthful days been foremost in the hunting-field, and contended, perhaps not unsuccessfully, in the steeple-chase. Such are the dams of the cracks of the Melton field, and of the victors at Liverpool and Leamington. But they are so difficult to buy, and so rarely in the market, that the majority of breeders have little chance of trying their luck with them. Their owners naturally desire to secure a foal, when it may be a great prize, won at a small cost, and will therefore seldom be disposed to part with them. It requires, moreover, a more ripened judgment and more mature experience, to select mares fit for the production of first-class hunters and steeple-chasers, than for the rearing of a less ambitious character of stock. The stallion to which they are put ought to be one of a superior class to the majority of the itinerant animals which secure the custom of so many farmers, simply because they save them the trouble of further inquiry. It may be laid down as a general rule that the horse ought, if possible, to be a better animal than the mare. Then there is the difficulty, even when a horse of tried excellence is found, of discovering whether his points and his blood are suited to the mare. The art and the science of breeding first-rate horses, are not to be mastered without much thought, trouble, and research. There is no royal road to it. He who wishes, in spite of every obstacle, to attain golden results, must adopt a course the very antipodes of the too common one, of putting some mare, because he happens to have her, to some horse, because it happens to come into his yard. He must never breed from a bad mare or a bad horse; nor must he grudge a few pounds spent in securing the best of either sex within his reach. A judicious outlay of capital will here assuredly not fail to reap the reward which has attended the improvement of every other description of stock.—I am, your obedient servant,

WILLOUGHBY WOOD.

A CHEAP MODE OF FEEDING PIGS.—In the year 1803 a very curious proposal was made to the public, by a Mr. Saunders, of Stroud, Gloucestershire, who asserted that he had discovered a new kind of food for pigs, which was so highly nutritious, and at the same time so extraordinarily cheap, that these animals might be kept (taking all ages together) at the low rate of one penny per head per day. Mr. Saunders observes, that "clover or sainfoin hay, at £4 4s. per ton, is 4s. 8d. per cwt., or one halfpenny per lb., and that twenty pounds weight of either, well boiled, will make, with the addition of the incorporating ingredients, sufficient wash or food to maintain, throughout the day, fifty store pigs, from three months old to an indefinite age and upwards." He then gives the following estimate of daily expenses of keepin g fifty store pigs:—

	s.	d.
Potatoes, one bushel	1	3
Meal, of any description	1	4
Clover hay	0	10
Coal	0	3
Attendance	0	6
	4	2

which is exactly one penny per head. Mr. Saunders affirms that a single sack of boiled potatoes, when mixed with this wash, and without any other ingredient, will go as far as four or five sacks when given without it, although boiled. He increased his stock of pigs to upwards of 400, consuming about five hogsheads of wash daily, and maintaining them at the very low rate of one penny per head daily, in excellent store order, and many of them fit for the butcher. He states that he is confident he could make one sack of meal, of whatever description, go as far as two sacks in the common mode of fattening.

ON THE EXHAUSTING OF LAND, AND ITS CONSEQUENCES.

A worn-out farm from over-cropping and improper manuring is the worst helpmate a farmer can espouse, being thriftless and always out of tune. Prodigal of what she receives, she starves her own legitimate offspring, and nurses all the bad company (weeds) which comes in the way—a family which never fails, in the long run, of prematurely making him an old man as well as poor. How different is the fertile farm, well drained, laboured, and full of manure! for it is always an overflowing source of comfort at all seasons of the year.

Let a farm be ever so fertile naturally, if once exhausted by over-cropping and imperfect manuring, *woe to the man* who has anything to do with it, especially if he has not got the extra capital in his pocket which it requires, for many examples of ruin might be quoted in proof of this. We give one in which, although the tenant entered with a capital of £10 per acre, and judiciously invested it, he was yet, at the end of four protracted years of thankless slavery and perturbation, turned out a beggar. The farm was enhanced in value about 25s. per acre; but by the time this was done, the poor man had run himself in debt for guano, bone dust, seeds, and other *et ceteras*, including one year's rent, when his landlord sold him out, taking indirectly the whole of his capital and some hundreds of pounds more, leaving his guano merchants and others with only a few shillings in the pound! so that he himself was actually worth less than nothing when he left. During the first three years the produce of the farm did not cover the expense of its cultivation, leaving him a loser by more than three years' rent and interest on capital during this period. By this time about £10 per acre were sunk in the lands over and above the ordinary working capital of the tenant; but it was not enough, for £5 more would have been necessary, besides a few years more of time, in order to let the land recover itself, as it were, from over exertion. It is not enough to give the hungry traveller a sufficiency of food, for he must also have a little time to digest it and recruit his exhausted limbs: so is it with the soil in question—time is necessary, in order to enable it to digest the manure before working it up into the organism of plants; and if one season is unfavourable, as is frequently the case, another is required for this purpose—hence the conclusion. Now, this additional £5, added to the £10 already invested, together with the first £10 of working capital, makes a total of £25 per acre! about half the value of the fee simple. Woe to the man, therefore, who embarks in such a farm, unless he has this capital! And when he does, investing it so as to be able to pay rent, what has he over in the shape of interest for this enormous sum? Seldom fair interest for the ordinary amount of working capital! If he receives twelve and a half per cent. for the first ten pounds invested, he is the lucky exception out of ninety and nine unfortunates, who never recover so much to provide for themselves and families.

The above example is, no doubt, an extreme one, there being but few cases where an extra capital of £15 per acre is required to ameliorate the exhausted soil. Granted, although £20 has been sunk. Tenants with £15 and £20 of extra capital per acre are indeed the exception to be met with. Few landlords are so fortunate as to meet with parties so heavy; for, if they could benefit £15 to £20 per acre for every incoming tenant, they would soon get rich. But this is not the view of the question to which our example points; for the tenant in it, unfortunately, had not even £5 of extra capital. If he had been in possession of this sum, it is more than probable that he had weathered the storm in which his unfortunate bark foundered; for he was a man of talent, integrity, and perseverance, with plenty of credit. He had only £10; a sum which few incoming tenants ever have; the other £10 invested was credit and interest on his working capital—invested, too, in the short space of four years; another condition of the transaction, which few are able and willing to comply with. Doubtless many could borrow as well as he, but few are so speculative as to do so; the more common course being to limit extra capital permanently invested to their own profits; these they will risk, but little more. For instance, if a tenant has £5000 invested in working capital, and if he has made 12 per cent., or any fair per-centage, on this sum according to equity, as his landlord a fair per centage on the fee simple of the farm for rent, as he doubtless is entitled to, then his profits would amount to £600 annually. Now he would risk this sum if he made it, but not more; which in eight years would amount to nearly £10 per acre over 500 acres; £2,400 in four years; so that, in this time, £2,600 would have to be borrowed.

But where is the incoming tenant who makes 12 per cent. on his capital for the first four years, when invested in a worn-out farm? If he makes this sum during the second rotation, he may think himself fortunate. Hence the screwing and enslaving character of the task of ameliorating exhausted lands.

Now many tenants are getting tired of the thankless and enslaving system, which has for its *ultimatum* the wearing of them out to the backbone. There are some minds which cannot as yet approach the idea of a colony as a more fruitful enterprise, but with feelings of disapprobation, and even terror. But when colonial farmers are able to return to the mother country, and give for short-horned Dukes and Duchesses £500, £600, and £700, as was given the other week at Tortworth-court, Gloucestershire; to say nothing of Mr. Mechi's prophecy of "The doom of the plough," and his "pledging his agricul-

tural reputation" in favour of the "Canadian digging and reaping machine;" such minds may soon see cause to take a more favourable view of colonial agriculture. For if tenants are called upon to invest extra capital to the extent of 10*l.* per acre, or any extra capital whatever, without security for re-payment at the expiring of leases, as well as fair per-centage during their currency, such extra capital, with their own ordinary working capital, invested in the prairie lands of America, or golden fields of Australia, through the instrumentality of such machinery, and improved breeds of cattle, may teach more than tenants a practical lesson, the theory of which they appear very unwilling to learn at present. Science and capital unfettered in a colony cannot fail ultimately, we say, of convincing English landlords that their very existence as landlords depends upon a different system of farming from that which has hitherto been practised, with a different security for capital; for otherwise they will be left to invest the extra capital required to restore their lands to a fair and profitable crop-bearing state themselves, and also the working capital too, for tenants will not resign their farms until they are exhausted. They cannot expect that English farmers will remain much longer silent spectators of the triumphs of colonial agriculture, not only overtaking the progress of agricultural science in the mother country, but preparing to leave her patriarchal systems in the background. Facts here are beginning to speak for themselves, leaving nothing for us to say.

Very many landlords, if not the majority, are as tired of the present system of things as are their tenants, for exhausted farms are every now and then falling into their hands, teaching them a practical lesson, not very easily forgotten. Neither are they blind to the increasing prospects from the progress of colonial agriculture, and the effects which such are likely to have upon the agriculture of the mother country, for many of them are welcoming those prospects with more cordiality than are their tenants, by purchasing estates for the surplus members of their families more freely. The surplus population of British agriculture, including landlords, tenants, and labourers, has been estimated at about 200,000 annually—a surplus for which her limited and already occupied estates, farms, and cottages, make no provision; hence the absurdity of any of those parties impugning the idea of a colony. Instead of such ingratitude, England ought to hail her colonies as the greatest temporal blessing which an Omniscient and all-bountiful Providence has ever conferred upon her—a blessing only beginning to be realized! Had our forefathers—the first inhabitants of Britain—seen our colonies of either hemisphere before crossing the English Channel, how few of them would have crossed it! It was the common theme of the press in 1851, that our colonial department of the Exhibition of the Industry of All Nations would produce the greatest effect; and it has done so, for since then our colonies have risen immensely in the estimation of the British public, and are destined to rise further as their boundless resources become practically more familiar to us. Enquiry has been aroused, and before the intelligent and enterprising sons of either landlords or tenants will invest limited capitals in British agriculture, under existing circumstances, they will first visit some one or other of our colonies so as to select the best bargain. "*Settling in the world" is becoming a question of pounds, shillings, and pence with them,* for if they can make 10 and 20 per cent. respectively in a colony, and only 3 and 10 per cent. in the mother country, few will think of the latter. Incumbered Estates Bills, and Transfer of Land Bills, will then experience less opposition in Parliament; while estates and farms will become more numerous in the market, and more easily acquired: and, as for our labourers, emigration with them has already become a wholesale concern, for a similar reason—because they get longer wages in a colony. Interest and wages are becoming primary elements in all agricultural questions, and the amount cannot fail in the long run of determining differences; indeed, facts are already beginning to speak for themselves, as formerly noticed; and landlords are as willing to appreciate these as tenants generally speaking.

Landlords and tenants are unanimously agreed as to the impropriety of exhausting land, and the loss arising from bad farming generally; but they are not agreed as to the best mode of avoiding such a calamity—for one party, attributing all our calamities to pecuniary embarrassments and antiquated patriarchal notions, briefly conclude that the only safe remedy to be relied upon is to get rid of such old-fashioned folks by the wholesale means of Incumbered Estates Bills and Transfer of Land Bills. A second party conclude that a revision of our Entail Laws, and Laws of Landlord and Tenant generally, would secure the necessary investment of capital to avoid the calamities at issue. A third party aver that the interest of the tenant demands something more: this is the practical party, being composed principally of tenants, who, arguing as they experience, conclude that stipulation, or "liberal covenants," as it has been termed, on which the last party places so much confidence, must either be too much in favour of the landlord, or too much in favour of the tenant; that, if there is a competition among tenants, as at present, landlords have it in their power to stipulate as they think proper, laying down printed rules and regulations for the management of properties, which tenants must either accept or reject *in toto;* the plausible theory of "a mutual agreement between parties" being thus practically thrown overboard by virtue of these "little Acts of Parliament," as they have not unaptly been termed; and that, on the other hand, if colonial enterprise should create a paucity of tenants, they would have the ball at their own foot, in a similar manner as they had prior to the existence of a surplus population of farmers, and kick it accordingly. They justly conclude that so long as the landlord continues to pocket ameliorations at the expiry of the lease, just so long will tenants continue to pocket exhaustion, so to speak, to balance it, in spite of all the restricting stipulations which landlords and their attor-

neys may concoct to the contrary. The soundness of this party's conclusions cannot be questioned; but its members are not the best qualified to judge of the legal means necessary to obtain the golden mean between the above two extremes, securing to the landlord and tenant the rights of their respective capitals, skill, and property. Hence the difference of opinion which exists among them. A fourth party goes further still, demanding full compensation for all discoveries in chemistry and mechanics, such as improved manures and machinery, without the exorbitant charges now made by the Patent Office, which prevent such being realized; and for this purpose they suggest a reformation of the Patent Laws, in addition to those of land. This party argues, that it is absurd to propose to ameliorate the soil as it ought to be, without more effective drainage and an increase of manure, because the demand far exceeds the present supply; and that the emigration of our labourers demand the abridgment of labour by new machinery for draining, and all other works and improvements. Here again all parties are agreed as to the importance of an increase of manure, draining, and machinery; but when we come to the topic of cheap patents as the means for obtaining such, opinions are as opposite as the east is from the west, while some hate the idea of patents *in toto*.

Now we cannot help concluding that much of this anomalous diversity arises from some misconception of the facts of the case in connection with land, its exhaustion and amelioration, and with the rights of inventive labour; for were the enormous loss which the nation annually sustains satisfactorily brought before Parliament, all this diversity of opinion would be tossed to the winds, and immediate steps taken for avoiding it; but here lies the practical difficulty of getting the facts of the case satisfactorily brought before Parliament. We may get a Committee in the Lords, and another in the Commons, and blue books from both departments of the legislature, as have been done; but what is the evidence they contain? Nothing less than the anomalous diversity of opinions in question!—nothing more!—a state of things such that some have gravely asked, "What is the use of legislating on land?" "Every malady of the landlord and tenant is beyond the reach of medical prescription! Nature must be left to cure herself! So long as foreign corn can be had for less money than home-grown, why waste the precious hours of Parliament on farming, when the commercial and manufacturing interests of the country demand more than all its time? Why interfere in a bargain between the landlord and tenant any more than between the greengrocer and his customer? Why proscribe the sacred rights of real property?" Such is their line of argument; and what does it amount to? Simply an abortive attempt to reduce the science of agriculture to mere commercial peddling twaddle! Of argument it does not contain so much as a single particle worthy of passing notice. It does require, however, that the facts of the case should be stated, which are these:—An acre of land has been reduced in fertility to the extent of 20 bushels of wheat per acre, and another acre of land may be increased 20 bushels per acre in fertility by proper management. Such are the facts of the case agriculturally stated; and that they are national calamities, which England has experienced from time immemorial, and will continue to do so until the end of time, unless some alteration in the relation between landlord and tenant takes place, requires no proof, for they will never of themselves effect a cure under their present weight of circumstances, the task amounting to nothing less, in many instances, than an impossibility. Incoming tenants every now and then will continue to be deceived, and exhausted farms thrown upon landlords, and that more numerously, while the public will continue to sustain a loss of millions annually in produce!

MR. ROGERS'S SYSTEM OF CROP-GROWING.

There are those who stigmatize all who do not fall in with every novel recommendation in farming as opponents of what is more familiarly and in too hacknied a manner yclept "progress." Once let a plan be successful in a single instance, how isolated soever it may be; once let a project, how impractical or costly or local, be found to succeed on one occasion, and all who doubt or demur are denounced as sceptical, and old-fashioned, and unfit for the "progress" of the discoveries of the present day. But, in fact, there requires caution as well as encouragement in all novel plans; there requires the gentle check, as well as the vigorous stimulus: for real progress can never be more arrested than by indiscreet and injudicious recommendations of harshly conceived, theoretically supported, and non-matured plans. Pure induction and analogical reasoning are utterly false as applied to the science of agriculture, modified as it is by circumstances almost to the reversal of its apparently necessary conclusions. What is true on one soil is absolutely false on another; what is correct in one climate is diametrically opposite in another; and theorising from a single fact is no better than ascribing the existence of the Goodwin Sands to Tenterden steeple.

We have over and over again recommended caution to be observed in the Lois Weedon farming, where manure was discarded. We thought it a revival of the exploded theories of Tull, vainly attempted to be realized by the energetic but mistaken Cobbett; and now we have before us a refinement of Lois

Weedon farming, in a proposal not only to dispense with manure, but to purify the grains of plants, the germ or parent of the crop, from the elements of impurity, disease, and death—not in England, but as far north as Elgin, in Scotland, where a Mr. Rogers professes to have discovered the cure for the diseases of plants, and then to grow them, these antagonistic forces removed, without application of any manure whatever.

Mr. John Wakefield, of Elgin, to whom he says Mr. Rogers is only known by his attention to the growing of corn, by this anti-manure system, has sent us specimens of his corn, about a week off ripening, and we must say it is a very superior grown, vigorous, and productive specimen. Mr. Wakefield says, "a person of the name of Rogers, residing in Elgin, has discovered a means of growing grain, vegetables, &c., without the aid of dung, guano, or any substance known as artificial manure. His crops are better than I see grown by the farmers in this neighbourhood, with all they can do with their present system. He is trying on some of the worst land here with barley, oats, and potatoes likewise, two acres of wheat, where wheat was grown last year, and he has been signally successful. Last year, he had two or three small parcels of land, and succeeded far beyond any of his neighbours." Mr. Wakefield further says, he has examined the grains, stems, &c., with a microscope, and compared them with those of his neighbours by the same means, and finds a great difference in the healthy appearance of Mr. Rogers's corn.

That gentlemen has also turnips now growing, sown on the 2nd of June, Mr. Wakefield says, writing on the 20th of August, measuring 18 inches in circumference; some sown on the 10th of June, upwards of 16 inches in circumference; and some on the 18th of June, as much as 15 inches. The specimens of wheat sent, sown so late as the 2nd of February in this year—so unfavourable for spring wheat—are 54 inches long on an average, and the ears are 3 inches in length, well covered; and we should say, if a fair specimen, and the plants are well set, we should calculate the produce at 42 to 45 bushels per acre.

We have few elements of describing the nature of Mr. Rogers's process. It does not seem to us to be anything connected with any stirring or deepening of the soil like the Lois Weedon practice, nor does it appear to be any steep calculated to manure the seed, but to be a disinfecting process with the seed, which he adds deprives it of certain destructive influences. Mr. Rogers himself says, "With loads of manure you have nourished the very maladies which eat them (the plants) away, and every year the rot gains upon your potatoes, the smut upon your wheat and oats, finger and toe in your turnips, &c., &c., till farming becomes a lottery that may either take a man to the banker's, or the poor's roll." In another part of the same address to the farmers of Morayshire, he observes, "Let the *seed be purified;* that is to say, let it be (made) sound, which you commit to the earth; let it be without corruption, and it will grow and come to maturity uncorrupted. Convinced of the truth of this self-apparent principle, I years back commenced my researches in nature and science, for the means of eradicating from the seeds of the earth the germs of impurity and scarcity which they had imbibed through the progress of ages. I am happy to say that my large expenditure, both of time and money, has not been unrewarded. The very first application of my discovery to the growth of wheat has been signally successful."

Mr. Rogers, it seems, wishes for no compensation —no remuneration for his plan. Though he does not say what it is, we infer he is ready first to have it tested, and, if successful, to give it to the public; at least this is what we infer from the letters we have received. He gives three instances of its success, and appeals to the farmers of Morayshire, his neighbours, as to the fact of his sowing one bushel of his prepared seed on a rood of very light sandy soil, and 12 bushels of wheat was the result. *i. e.* at the rate of 48 bushels per acre. This, however, had 5 small loads of dung to it, because the farmer refused to allow Mr. Rogers to sow it unless it was so manured. On some other land, as it appears to us, it was also sown, and produced a similar quantity; while on some moor land, "a piece of ground," belonging to Mr. W. Taylor, of South View, Elgin, "as wretched for agricultural purposes as can ever be possibly imagined," 6½ bushels of wheat was produced per rood—26 bushels per acre, as we infer, altogether, without manure. Now we wish to give these facts, as we receive them, to our readers; to remind all the admirers of Lois Weedon farming that this is a step beyond them in progress. In the mean time, can any of our readers in the north make it convenient to look at Mr. Rogers's produce, for he courts inspection, and report to us on the facts of this case?

We think it abundantly clear, that whatever is done beyond pure attention, must be done to the seed, as it appears there is no particular care or attention to the land.

We would receive, ourselves, with the greatest caution, all plans which denuded the soil of manure, and the plants of food; but it no more becomes us to close our eyes to the manifestly well-meant and liberal efforts of Mr. Rogers, than it does to crush all attempts at discovery or improve-

ment just because it seems improbable. Voltaire called Sir Isaac Newton a dolt, because he suggested the possibility of one day travelling at the rate of 50 miles per hour; and such would a man have been called 25 years ago, who could have imagined that a message could be conveyed from London to Edinburgh in ten minutes!

Sir,—I find, in a leading article of the 12th inst., an account of my growing crops under my improved system of agriculture, likewise a few extracts taken from my first letter to the farmers of Morayshire, which I addressed to them through the *Courier* and *Courant* journals of this town, twelve months ago. I tender you my warmest thanks for bringing this all-important subject before my fellow-countrymen.

I cannot answer your leader better than by extracting a part of my second letter to the same parties. In my first letter to the farmers I stated that it was my intention to disinfect seed for sowing; but I did not then state under what circumstances I was prepared to disinfect that seed. The public, very naturally, have taken both these statements in a mercantile sense, if I may be allowed the term; and the consequence is, that I have had applications for innumerable bushels of potatoes, and requests to disinfect grain, with which it would be physically impossible for me to comply. These circumstances have strengthened my first impression—that in making an individual mercantile affair of the great and important secret which it has been my good fortune to discover, I should be doing justice neither to the public nor myself. "Sir, I think you and your readers will admit that, if all I have stated of my experiments is true, that the method of which they are the result will, by its general adoption, be productive of a benefit to the nation at large unparalleled in the history of civilization. Can I, then, be too bold in thinking that the test of the truth of my statements and the effectiveness of my method, and likewise the reward for my exertions and outlay, should be something like national also? The course, then, which I think it is my duty to pursue, under these circumstances, is to place my services at the disposal of either or both of the great national agricultural societies. Let them test my discoveries by any experiments they please; and when I have triumphantly—as I know I shall do—passed through the ordeal they may appoint, let them say how far, and in what way, I am to be rewarded for placing within the reach of all cheap and abundant food, that shall invigorate the body and ward off disease, and for rendering agriculture at once a safe and profitable profession to all who follow it. But, lest the farmers of Morayshire may think that I am not acting up to my public statement, I intend to prepare seed for one or two farmers, that seed to be put into the ground under my inspection; and then the owners of the ground may place any watch or ward over it they please, and, closely testing every period of the growth of the crops, proclaim the result to the country. If I am deceiving myself, then let that bandage be removed from my eyes which has hitherto blinded me to what otherwise would have been peace and prosperity. If I am deceiving others, let me be scouted as a cheat and treated as a knave; but if I am doing neither, let that which is for the good of all be made manifest to all, and let some recompence be made for the weary watching, the anxious cares, and the whips and scorns of outrageous fortune, which, in the pursuit of that good, have so long been the lot of your obliged and obedient servant."

Sir, the result of that letter brought one person to me. He represented himself as delegated by a great body of gentlemen-agriculturists, who were desirous of testing my principles. The offer he made was such—that I was to give them credit for disinfecting the seed; they would pay a little, at an average price, for the seed; and I was not to see my seed committed to the earth; and, after twelve months' credit, if they liked my plan, and felt they were satisfied after thrashing out, then, and not till then, was I to have payment for all the disinfection of the seed.

I leave comment to the world. My system is the simple path of nature's right, quite opposite to that of Lois Weedon farming, where manure is discarded. I do not discard manure. Manure is a safe and true management. I discard dung of every description, being nothing but a compound of corruption. I first look to my land and relieve it from its load—for the earth groans, being burdened—and then give it its real food and nourishment. I then purify my seed from its unnatural body, and supply it with food for the growth of a new and pure body, so that the elements of impurity, disease, and decay are for ever done away. This have I proved long before I ever attempted to bring before the face of the public such a new, mighty, and transcendent change upon all the old, worn-out system of agriculture. But I am not astonished at the dark side which men always look to, but continue blind and perseveringly hostile to one and all the true manifestations of nature's only balm—that balm that causes her to go on steady in her course, and not to reel with dismay, as we have been wont to look upon her. Let the farmers and the gentry of Elgin and the surrounding country, who have so repeatedly visited my crops this summer at Maison-Dieu, publish to the world the truths which were made manifest before their eyes, the result of all my labours on that land, that one and all have acknowledged to me the like before they never saw. I ask it not as a favour to myself, but as a fellow-feeling they owe to society, and, above all, to the enraged feelings of suffering humanity.

I will not state what has been the result of my labours in that land; but I trust some lover of truth and justice will be courteous enough to answer the stranger's request, that will be found in the columns of the *Mark Lane Express* and the *Farmers' and Gardeners' Journal*, where he invites some kind friend in the north to send him the particulars of my crops.

I flatter myself that these remarks will not be taken amiss by the farmers of England; for I have no other motive in view but the well-being of all God's creatures. Experiments which I have made this year urge

me onward in the paths of truth. I have proved that my system will answer in every clime and on every soil.

The cause of the present systems being so diametrically opposite and false to each other lies in the impurity of the seed and earth being affected with corruption. The parent in every country and every clime, it at last destroys its votaries with death. Can any one doubt the truth of what I have stated? Do not our greatest chemists pronounce it (the dung, dirt, or filth) the sole enemy of man? Does not every board of health pronounce it as the great harbinger of disease, pestilence, and death? Is not that truth enforced under the Sanitary Act, which pronounces these dung-pits as the sepulchres of deadly poison, the effluvia of which is pestiferous, and vitiates the air? And, after all these judgments and denunciations, that putrid matter is taken to the field and garden, to inoculate the soil, so that the seed may—yea, it does—receive its poisonous sting. Can we be surprised that our physicians and surgeons combat with the multiplicity of fevers by which we are assailed? They forbid the use of fruit. Why not discard the use of bread and vegetables? also the use of flesh-meat? The animal is fed upon this corruption. Why not speak the truth at once, and say all is wrong? J. ROGERS.

176, *High-street, Elgin.*

P.S.—My disinfected seed will yield at least double the present return, when put on to land, even in the old system of dunging.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

CONSECUTIVE ANALYSIS OF THE STOCK SHOWN AT THE GLOUCESTER MEETING.

(Continued from page 362.)

SHEEP.

The classes here have been well sustained. The Cotswolds were very numerous (being their own country), and in fine condition, quite as fat as usual, and some few had that novel placard before them, in large characters of red ink, "Disqualified for over-fatness;" but the animal was there, and breeders see their condition and quality, and the knowledge that this disqualification rendered them ineligible as competitors subjected them to greater criticism. The Leicesters and Southdowns were two very good classes, we think not quite equal to former years. Though better animals individually we have not seen as some of the classes contain, we speak as a whole. We were much pleased with the local classes, called Shropshires. Our anticipations were unfavourable, and these accordingly presented to us greater interest. Some of the animals shown in this class were not surpassed in the yard—correct in form, good in general feature, fine in quality, and large in frame, with plenty of wool of fine fibre. Some of the animals shown in these classes were decidedly inferior, and varied much. These want more character, and this meeting will do much for them as a class of animals. We inquired the pedigree of one animal: it was from a cross, about fifteen years since, between the Cotswold and Down, this cross being perpetuated up to this time, by which the breeder considered he had established his breed. Some clumsy-looking animals were shown in it. We are tired of repeating that "all breeds must aim at the same general conformation." The prize list will this year point out pretty well what that is, to all who have seen the animals exhibited at the Gloucester meeting.

LEICESTERS.

CLASS I.—SHEARLING RAMS.

297—299 J. Hall, of Bretforton, near Evesham, Worcester, three 15½ months old rams. Three sheep with indifferent frames and varied wool; too narrow and light make.

300—304 T. E. Pawlett, of Beeston, near Sandy, Bedford, five 16 months old rams. These are a much better lot: 302 (second prize) is a very good sheep, with a frame of fine proportions; so is 301; 303 has a good rump. These show a fair portion of good wool. 303 commended.

305—309 W. Sanday, of Holme Pierrepont, near Nottingham, five 16 months old rams. We think these a still better lot: their frames are beautiful, and quality fine. 308 (first prize) is very complete; his chine, and plaits, and depth of chest, all good. 309 is a good sheep; we should prefer a little more wool. 309 highly commended.

310—312 G. Turner, of Barton, near Exeter, three 16 months old rams. A lot of very useful sheep, but not so proportionate as the two last lots, standing higher, having more offal. We should like a greater depth of frame.

313 and 314 W. Abraham, of Barnetby-le-Wold, near Brigg, Lincoln, two 16 months old rams. Good and useful sheep; larger sort, and more wool; not quite in accordance with our idea of a true-bred Leicester.

315—317 J. Borton, of Barton-le-Street, near Malton, Yorkshire, three 16 months old rams. Very pretty, well-made sheep, with fine wool. 317 has more frame; mutton rather loose as a whole. 316 and 317 commended.

319 and 320 J. Moon, of Lapford, near Crediton, Devon, two 16 months old rams. Compact, good shearlings.

321 Sir W. Russell, Bart., of Charlton Park, near Cheltenham, a 14 months old ram. Large, and loose in condition. Query, was this in right class?

322 and 323 S. Kingdon, of Lynch, Thorverton, near Cullompton, Devon, two 16 months old rams. Useful sheep; condition defective.

324 and 325 G. Radmore, of Court Hayes, Thorverton, near Cullompton, two 16 months old rams. Very good sheep, particularly 324.

CLASS II.—RAMS OF ANY OTHER AGE.

326—328 J. Hall, of Bretforton, near Evesham, Worcester, three 39½ months old rams. These sheep do not possess good frames, nor are they correct in form.

329—337 T. E. Pawlett, of Beeston, near Sandy, Bedford, nine 40 months old rams. A very splendid lot, good in size, good in wool, good in looks, in every respect good. We thought them a little defective in condition for first-class animals. 331 (first prize) is a

large, fine animal. 329, 322, 333, and 336 were commended.

338—342 W. Sanday, of Holme Pierrepont, near Nottingham, five 28 months old rams. This is a first-rate lot, somewhat less than the preceding, but more complete in form, and in firmer condition; they do not look to possess quite so much wool. Their forms are *all but* correct. 340 (second prize) is equal to any Leicester we have seen, in form and quality. 338, 339, 341 commended, 342 highly commended.

343 and 344 G. Turner, of Barton, near Exeter, two 40 months old rams. Large framed sheep; heads and legs too large for pure Leicesters. 343 commended.

345 and 346 W. Abraham, of Barnetby-le-Wold, near Brigg, Lincoln, two 28 months old rams. Fine, compact, good sheep.

347 and 348 J. Borton, of Barton-le-Street, near Malton, Yorkshire, two 20 months old rams. Good sheep; 348 capital chine and plaits.

349—351 J. Umbers, of Wappenbury, near Leamington, Warwick, three 40 months old rams. A good lot, with proper frames, but rather too small. 349 good chine and plaits. 349 commended.

353—355 J. G. Watkins, of Woodfield Ombersley, near Droitwich, Worcester, three 40 months old rams. Three useful sheep; rather large offal and heads.

Class III.—Shearling Ewes.

357 J. Wilkins, of Corse, Gloucester, a pen of five 15 months old ewes. We think these did not do credit to the exhibitor. We hope he will take the lesson designed to be taught, and improve his breed.

358 and 359 W. Sanday, of Holme Pierrepont, near Nottingham, two pens of five 16 months old ewes. Ten very superior animals, we think surpassing any of the splendid lots hitherto shown by this exhibitor.

360 W. Abraham, of Barnetly-le-Wold, near Brigg, Lincoln, a pen of five 16 months old ewes. A very good lot of shearling ewes, and commended.

These classes were very creditable, and, as a whole, more in accordance with what a true-bred Leicester class ought to be. Some years we have seen much greater dissimilarity.

SHORT-WOOLS.

Class I.—Shearling Rams.

362 and 363 W. Rigden, of Hove, near Brighton, two 16½ months old rams. Good sheep. 362 possesses a beautiful frame; head defective, and too much skin shown 363 a good hind quarter.

364 and 365 T. Ellman, of Beddingham, near Lewes, Sussex, two 15 months old rams. Very useful and fine sheep.

367 and 369 The Duke of Richmond, of Goodwood, near Chichester, two 16 months 2 weeks old rams. Good sheep. 367 nice frame; 369 too long in frame, and not level.

372—377 W. Sainsbury, of Manor House, West Lavington, six 16 months old rams. These are a lot of very useful sheep, and profitable; but their heads are rather large, and crowns high, and their frames not very compact as a whole. 377 has a good frame.

379 The Marquis of Conyngham, of the Castle, Slane, Meath, a 1 year and 3 months old ram. A fair mountain or Cheviot sheep.

380—383 J. Thornhill Harrison, of Frocester Court, near Stroud, Gloucester, four 16 months old rams. These sheep possess a good quantity of wool, but indifferent frames.

384—387 H. Scott Hayward, of Folkington, near Willingdon, Sussex, four 16 months old rams. These are rather small, but prettily formed, with light wool.

390 and 391 Lord Walsingham, of Merton Hall, near Thetford, Norfolk, two 15½ months old rams. Useful, light-woolled sheep.

393—398 Henry Lugar, of Hengrave, near Bury St. Edmund's, Suffolk, six 16 months old rams. This lot contained some very prime animals; frame and form all that could fairly be wished. We think breeders must be very fastidious to object to some trifling difference in the colour of the face or legs when the animal is all right. 393 is a splendid sheep.

402—411 Jonas Webb, of Babraham, near Cambridge, ten 16 months old rams. This is Mr. Jonas Webb's lot of splendid shearlings; we do not know when he exhibited a better. We took some pains to ascertain for ourselves if Mr. Webb's were in truth the best sheep, according to our humble judgment; and we are free to confess that, to our taste, we could select some we thought as profitable for service, but we could not find any so perfect in form or so true in breeding, such rotundity in frame, such quality of flesh, lightness in offal, and general symmetry and beauty of countenance, as is to be found in the majority of this lot. 404 first prize, 408 second prize, 405 to 407 commended.

412 R. Boys, of Eastbourn, Sussex, a 16 months old ram. Small; girth not good.

415 and 416 The Earl of Chichester, of Stanmore, near Lewes, Sussex, two 16 months old rams. These not good in frame; girth (or chine, &c.) defective.

421 and 422 Sir R. G. Throckmorton, Bart., of Buckland, near Faringdon, two 16 months old rams. Good useful sheep; rather slender girth.

423—425 J. Williams, of Buckland, near Faringdon, three 16 months old rams. Three good sheep, with plenty of wool. This is a good and well-filled class; scarcely one defective animal.

Class II.—Rams of any other Age.

426 and 427 W. Rigden, of Hove, near Brighton, two 28½ months old rams. Very good sheep. 427 (second prize) is nearly all we want in frame; back very straight, broad, and good substance.

428 and 429 T. Ellman, of Beddingham, near Lewes, Sussex, two 29 months old rams. Very fair formed sheep, but not depth enough in frame.

430—435 W. Sainsbury, of Manor House, West Lavington, near Devizes, six 28 months old rams. These are a good useful lot, but not quite to our taste: heads too large, girth too slender, not compact enough in form, still very good, profitable animals. We must have a compact form, *if it is* of large size. 435 has a beautiful frame, but the rump is short. 435 highly commended.

437 The Marquis of Conyngham, of the Castle, Slane, Meath, a 4 years 5 months old ram. Cheviot; a fair useful sheep of its kind.

438 Henry Lugar, of Hengreave, near Bury St. Edmunds, Suffolk, a 40 months old ram. This is a very good sheep; good length of frame, and level, good back. If he has a defect, it is in his chine and girth.

439 Henry Lugar, of Hengrave, near Bury St. Edmunds, Suffolk, a 28 months old ram. This, we think, is very nearly, if not the best Southdown ram we have ever seen; its form and general appearance is splendid. He very properly took the first prize; taking his age into account, he is unequalled.

440 and 441 T. Robinson, of Burton-on-Trent, Stafford, two 51 months old rams. Useful sheep, nice frames, but too short.

442 and 443 The Duke of Beaufort, of Badmington, near Chippenham, a 40 and a 28 months old ram. Very good sheep.

444 The Earl of Chichester, of Stanmer, near Lewes, a 28 months old ram. A good sheep; too slender in frame.

445 J. Talbot, of Temple Guiting, near Cheltenham, a two years 4 months old ram. This sheep will neither do credit to the exhibiter or the stocks of Messrs. Ellman and Grantham, from whose flocks it professes to be descended. It just shows what injudicious breeders may do by bad selection and mismanagement.

Class III.—Shearling Ewes.

446 W. Rigden, of Hove, near Brighton, a pen of five 16½ months old ewes. A very fine lot of well-formed ewes, of beautiful appearance and form; highly commended.

448 J. Talbot, of Temple Guiting, near Cheltenham, a pen of five 16 months old ewes. Not creditable to a breeder in an ordinary market.

449 The Duke of Richmond, of Goodwood, near Chichester, a

pen of five 16 months and 2 weeks old ewes. Good ewes, of great substance, too long in frame, necks thin and long; commended.

450 The Earl of Radnor, of Coleshill, near Faringdon, a pen of 15 months old ewes. Small, with thin necks.

451 The Marquis of Conyngham, of the Castle, Slane, Meath, a pen of five 1 year and 3 months old ewes. Cheviots; fair of the kind.

452 Lord Walsingham, of Merton Hall, near Thetford, Norfolk, a pen of five 15½ months old ewes. Very good frames, but light wool; highly commended.

453 H. Lugar, of Hengreave, near Bury St. Edmunds, Suffolk, a pen of five 16 months old ewes. A very splendid lot; form nearly perfect, looks good, wool good, great substance, for symmetry and beauty unequalled by any in the yard. First prize.

454 The Duke of Beaufort, of Badminton, near Chippenham, a pen of five 16 months old ewes. A very pretty and compact lot.

455 H. Lugar, of Hengrave, near Bury St. Edmunds, Suffolk, a pen of five 16 months old ewes. A very capital lot, very similar to 453; necks rather thinner, but altogether nearly perfect. Second prize.

We never saw more profitable Downs than here exhibited. Mr. Lugar has shown many very first-rate animals, possessing more than the usual size and substance, but retaining all the best qualities of the pure Southdown. This is as it should be; we want all we can procure of meat and wool without losing any good point or quality.

LONG WOOLS.

Class I.—Shearling Rams.

456—458 W. Hewer, of Hill House, near Northleach, Gloucester, three 16 months old Cotswold rams. 456 a good sheep; fine form and quality; wool thin, and varied. 457 better thigh and chine; wool varied. 458, better plaits, shoulder defective, legs too near, back good; wool more alike.

460—465 Lord de Mauley, of Hatherop, near Fairford, Gloucester, six 18 months old Cotswold rams. 460 useful sheep; common look, with varied wool. 461 smaller, and narrower frame. 462 longer sheep, rump low; stands better than last, but not so handsome. 463 general frame and back good. 464 fair frame; stands badly. 465 smaller frame; fair.

466—470 W. Garne, of Aldsworth, near Northleach, Gloucester, five 16 months old Cotswold rams. 466 a fine sheep; large frame, broad loin, fair thighs, stands high, shoulder fair, rather low fore-end. 467 smaller; rump good, stands lower, wool straight, purse covered. 468 a capital shearling; stands high and well; good breast, chine, and plaits; wool fair; a fine-made animal, legs perhaps too long; took 2nd prize. 469 a very good sheep; stands lower, good chest, and deep frame; wool too straight, not curly; highly commended. 470 a fine sheep; rather low on chine, fine rump, and loin narrow, with straight wool.

471—476 E. Handy, of Sevenhampton, near Andoversford, Gloucester, six 16 months old improved Cotswold rams. This is a very useful lot, but too narrow in frame, and too long on the leg; backs good, but not broad enough; wool fair. 471 is a very useful sheep, and commended.

477 W. Slatter, of Stratton, near Cirencester, a 16 months old Cotswold ram. A more compact kind of sheep, denoting Leicester blood.

478 and 479 G. Hewer, of Leygore, near Northleach, Gloucester, two 16 months old Cotswold rams. Two very useful sheep; fair rumps, but indifferent chines. 479 commended.

480 W. Smith, of Bibury, near Fairford, Gloucester, a 15 months old improved Cotswold ram. A large sheep, with light wool; dark face and legs.

481—483 W. Cother, of Middle Aston, near Woodstock, Oxon, three 16 months old Cotswold rams. A useful lot; very good sheep.

484—489 G. Fletcher, of Shipton, near Andoversford, Gloucester, six 16 months old Cotswold rams. A useful lot; shorter, and more compact; fair wool, dark faces and legs. 485 nice frame and wool, good back; commended. 488 tall, and fine looking; commended.

491 and 492 J. Lane, of Barton Mill, near Cirencester, two 16 months old Cotswold rams. Two very useful sheep; longer in frame, and longer wool.

494—498 W. Lane, of Broadfield Farm, near Northleach, Gloucester, five 16 months old Cotswold rams. A very good lot, with large frames; good wool; all denoting true breeding. 495 took 1st prize; he is a capital sheep, with fine rump and depth of frame. This is the best lot of shearlings shown in this class; and do the breeder great credit.

499—501 W. Smith, of Bibury, near Fairford, Gloucester, three 15 months old improved Cotswold rams. A good lot, and much alike; they possess dark faces and legs, good frames, and curly wool.

This is a very good class; the best we have seen of the kind.

Class II.—Rams of any other Age.

502 C. R. Smith, of Southrop, near Fairford, Gloucester, a 4 years and 4 months old Cotswold ram. A very heavy, mis-shapen rump; plait heavy, but out of form.

503—505 W. Hewer, of Hill House, near Northleach, Gloucester, three 40 months old Cotswold rams. Three extraordinary sheep, but varied in form; and wool of varied sort.

508 Lord de Mauley, of Hatherop, near Fairford, Gloucester, a 5 shear Cotswold ram. A large, useful sheep, but too "skinny" under jaw; thigh and flank thin.

510 and 511 W. Garne, of Aldsworth, near Northleach, Gloucester, two 40 months old Cotswold rams. Two large sheep; good frames, but light wool. 511 commended.

512 and 513 E. Handy, of Sevenhampton, near Andoversford, Gloucester, two Cotswold rams. 512 a beautiful sheep; capital chine and plait. 2nd prize. 513 very good, more wool.

514 W. Slatter, of Stratton, near Cirencester, a 28 months old Cotswold ram. Capital quality; rump defective, fine shoulders, chest good, wool thin. 1st prize.

515 and 516 W. Cother, of Middle Aston, near Woodstock, two Cotswold rams. 515 very good sheep, and more wool. 516 good.

Class III.—Shearling Ewes.

520 W. Coldicott, of Over Norton, near Chipping Norton, Oxford, a pen of five 15 months old Oxfordshire ewes. A good lot, compact, fair wool.

521 and 522 Lord de Mauley, of Hatherop, near Fairford, Gloucester, two pens of five 18 months old Cotswold ewes. 521 thin in frame, and longer on legs. 522 still narrower.

523 and 524 W. Garne, of Aldsworth, near Northleach, Gloucester, two pens of 16 months old Cotswold ewes. 523 still less in frame. 524 rather larger; same form.

525 T. Gillett, of Kilkenny, near Witney, Oxford, a pen of five 17 months old ewes. Fine sort.

526 and 527 W. Cother, of Middle Aston, near Woodstock, Oxford, two pens of five 16 months old Cotswold ewes. Pretty, but dark and spotted faces and legs; good wool.

528—530 G. Fletcher, of Shipton, near Andoversford, Gloucester, three pens of five 16 months old Cotswold ewes. Very useful, but by no means alike in looks or frame.

531 and 532 T. Gillett, of Kilkenny, near Witney, Oxford, two pens of five 17 months old ewes. Well matched; more wool, longer frames, some speckled legs and faces.

534 and 535 W. Lane, of Broadfield Farm, Eastington, near Northleach, two pens of five 16 months old Cotswold ewes. Two very fine and handsome lots of first quality, and fine offal. 535 a beautiful lot; the perfection of large sheep in quality and beauty. 535 1st prize, 534 2nd prize.

SHROPSHIRES.

While inspecting the class of Kent or Romney Marsh sheep shown at Lewes last year, in the Local or Special Prize Class, we made some derogatory remark, intimating that the class, as a whole, were scarcely entitled to their prizes. A highly respectable breeder overhearing the

remark, exclaimed, "Oh! come to Gloucester next year, you *will* complain then." Well, we have been to Gloucester; but instead of complaint or censure, we have, as a whole, to express our unqualified approbation of the various classes shown for those prizes. We do not admire every animal in these classes; many of them have neither form nor character; but, as a whole, they are highly creditable to the western district. When sheep (Southdown or any other sheep) possess correct proportions in form, large frames, great beauty, good quality of meat, fine wool, and plenty of it, we call them good ones, and worthy our best commendation; and such were many of the sheep shown in these classes. We question if the Southdown and Cotswold (No. 537) shown by Mr. Gillett had his superior in the show, as a sheep for general usefulness and profit; and No. 546, shown by Mr. Horton, was a very profitable sheep. The pens shown by Mr. Foster were striking examples of good ewes, and prolific as well as excellent breeders. These are not "pure Southdowns"—we know it—but they are a very useful class of animals for any breeder to adopt. We think pure Southdowns less profitable. They are too small, grow too slowly, and produce too little wool and mutton. The population demand a larger joint, and they will have it. We will run through the classes; and the two or three words we have to say upon each our readers must just take for what they are worth; our hope and aim is to guide to a true and correct estimate of breed and breeding.

CLASS I.—RAMS OF ANY AGE.

536 and 537 J. Gillett, of Brize Norton, near Witney, Oxford, two Cotswold and Southdown rams. 536 is a large and highly profitable shearling, having much the appearance of a pure Southdown; highly commended. 537 is a very large sheep, possessing much of the Southdown character; his frame is nearly perfect; his defect is in the rump being a little too short, and not sufficiently up; the quality of mutton very good; wool plentiful; for size and substance unequalled by any sheep possessing the Down character in the yard.

538—540 S. Meire, of Castle Hill, near Much Wenlock, Salop, three improved Shropshire Down rams. Three good sheep, possessing large frames.

541—543 S. Druce, of Eynsham, near Oxford, three cross-bred rams. Three queer-looking animals; frames not compact enough, and heads large; they are a cross breed; they want to be more proportionate in most points.

544 J. Futcher, jun., of Fovant, near Salisbury, a 16 months 3 weeks and 1 day old improved Hampshire Down ram. A very coarse-looking Southdown.

545 P. Morris, of the Hurst, near Clun, Salop, a 2 years and 4 months old Shropshire ram. A coarse, queer sheep.

546 T. Horton, of Harnage Grange, near Cressage, Salop, a 2 years and 4 months old Shropshire Down ram. This is a very good sheep, both in frame and wool, and possesses marks of a highly profitable character; qualified for any country. 2nd prize.

547—550 S. King, of Old Hayward Farm, near Hungerford, four West Country Down rams. These are a large class of animals, but rather coarse in frames and heads.

552 C. Randall, of Chadbury, near Evesham, Worcester, a 28 months old Shropshire ram. A useful sheep; head too large.

553 and 554 The Earl of Aylesford, of Packington, near Coventry, Warwick, two Shropshire rams. These are of better quality, are useful sheep, with better frames.

555—557 J. Druce, of Eynsham, near Oxford, three Oxford Grey rams. These sheep are far too long and coarse in frame; head large.

558 G. Haughton, of Pitchford, near Shrewsbury, a 15 months old Shropshire Down ram. This is a large useful sheep.

559—560 S. Matthews, of Montford, near Shrewsbury, two 2 years and 4 months old Shropshire Down Rams. These are not in good form; frames not compact enough.

561—565 W. Foster, of Kinver Hill Farm, near Stourbridge, Worcester, five 16 months old Shropshire Down rams. These sheep are much what we like; they are good, useful, well-made sheep, very useful in frame and character.

566—571 W. Humfrey, of Oak Ash Farm, Chaddleworth, near Wantage, Berks, six West Country Down rams. These are large, but not good frames. The prevailing fault in this class is a large and loose frame; the frame, however large, must have compactness and rotundity.

CLASS II.—EWES OF ANY AGE.

572 S. Druce, of Eynsham, near Oxford, a pen of five 40 months old cross-breed ewes. These cannot be right; frames too long and narrow. The lambs are well-grown.

573 W. Brettell Vaughan, of Burway, near Ludlow, Salop, a pen of five Shropshire grey and black-faced ewes. A moderate lot, and singularly shorn.

574 S. Mathews, of Montford, near Shrewsbury, a pen of five 3 years and 4 months old Shropshire Down ewes. Poor, but possess fine frames.

575 W. Foster, of Kinver Hall Farm, near Stourbridge, Worcester, a pen of Shropshire Down ewes. A good lot in any county, with eight very fine lambs. Prize.

CLASS III.—SHEARLING EWES.

578 S. Meire, of Castle Hill, near Much Wenlock, Salop, a pen of five improved Shropshire Down ewes. A pen of very good ewes. Highly commended.

579 S. Druce, of Eynsham, near Oxford, a pen of five 16½ months old cross-breed ewes. A very useful lot; legs too long.

581 S. King, of Old Hayward Farm, near Hungerford, a pen of five 17 months old West Country Down ewes. A very useful pen of ewes, but do not match well.

582 The Earl of Aylesford, of Packington, near Coventry, Warwick, a pen of five 16 months old Shropshire ewes. These do not possess good frames, though useful stock ewes.

583 S. Matthews, of Montford, near Shrewsbury, a pen of five 1 year and 4 months old Shropshire Down ewes. These are much more compact, but small.

584 and 585 W. Foster, of Kinver Hill Farm, near Stourbridge, Worcester, two pens of five 16 months old Shropshire Down ewes. These are two pens of prime ewes, and well qualified for any county; large size and good frames. 585 is a very good lot. 1st prize.

586 J. Hand, of Ludlow, Salop, a pen of five 16 months old Shropshire Down ewes. A useful lot, but frames defective.

We must acknowledge that purity of breeding is wanting in these classes; but we say the class of stock is good and profitable. Next year the meeting will be at Lincoln. This is a famed county for Lincolnshire long-wools; but they are not qualified, according to generally-received notions, to compete with the Cotswolds. Here a most valuable and distinct breed is perpetuated; in many respects superior to the Cotswolds. They possess more wool, and far better quality of mutton, but are not so large. We suppose they will have a distinct or special class; and we shall look forward with great interest to see what the Lincolnshire breeders will bring into competition. The Shropshires have retrieved their character; and if we might anticipate, we should say that the Lincolnshire long-wools will go far to eclipse both Cotswolds and Leicesters, and prove themselves worthy a separate class—extending as they do over a large surface of country, and being more numerous than Cotswolds.

(To be continued.)

TRIAL OF REAPING MACHINES AT STIRLING.

At the Stirling trial of reaping machines there were no extra varieties, although the amount of money offered by the Stirling Society amounted to nearly three times that given by the Royal Agricultural Society of England; thus exhibiting to the world that in one county in Scotland there is more interest taken in the furtherance of the application of machinery to the harvesting of grain, than has been shown by the Royal Agricultural Society of England, and indeed the whole of the agricultural societies of England: this speaks volumes for the spirit of the Stirlingshire farmers.

We may mention that the arrangements were very good, and everything done to ensure the best machines winning. There were twenty-one entered; showing how large a number of parties were either attempting new inventions or improvements upon the old reaping machines. We inspected some of those inventions, one of which has a self-acting rake far superior in every way to the American automaton. In fact, we are satisfied, from what we have seen before and since this Stirling trial, that an immense impulse has been given toward the improvement of reaping machines through the liberal prizes offered by our northern brethren; although from the fact of only seven machines coming forward, it would appear that nothing new was going forward. But inasmuch as prudent men, after a trial at home see that their inventions are not matured enough to enter the field with Bell's Champion Reaping-machine, they show their largeness of mind by keeping them at home, until they can make them such as they desire, or by abandoning them as unequal to the contest—thus preventing that labyrinth of indecision in the minds of farmers about having machines to meet their coming wants, in the hope of something better being brought out. We are of opinion that Bell's machine will take a vast amount of beating; indeed, all that ever we can hear against it is, that it is too severe work for two horses, which is decidedly the case; but by working four horses, two at a time, in relays of two or three hours, it would not be overwork for them. We have seen a great many of these machines in the hands of farmers, who state that after the machine has been worked some time it becomes much easier on the horses, and not at all difficult to manage at the turnings. We were delighted with the way we saw these machines managed on several farms in the north, where the land is beautifully farmed for the purpose, the men steering the machines perfectly straight, and cutting an average of five feet ten inches wide, laying it in beautifully even swathes, which were the most perfect in the heaviest crops.

We observed that where the crop was laid very flat it was necessary to work against the lie of it, and return idle; but where the crop was only laid over, and with three or four inches of the straw at the bottom about upright, then these machines made capital work, going across the lie of the crop, delivering in the same direction as it lay. We hope this long preface to a description of the Stirling trial will be pardoned, and accepted by our readers with the same earnest desire for the furtherance of mechanism being applied profitably to agriculture, as we feel and long to see realized.

This competition of reaping machines, in which so much interest has been taken by all parties, that it was looked forward to as the great trial for the championship of the harvest field, came off on Tuesday, the 6th ult., upon the farm of King's Park, in the neighbourhood of Stirling: it is the property of the Crown, and occupied by Mr. Peter Dewar, whose crops gave a very fair trial, but not quite so severe as was desirable on such an occasion, except the beans and peas, which were certainly a tremendous crop, and quite green.

The numbers collected could not be less than from five to six thousand. Among those present were the Duke of Buccleuch, the Marquis of Tweeddale, Lord Kinnard, Mr. Cardwell, President of the Board of Trade, Lord Abercromby, Mr. Forbes of Callandar, M.P., Mr. Hay of Dunse Castle, Sir William Gibson Craig, Mr. Wardlaw Ramsey, Mr. Smith of Carbeth, Mr. Speirs of Culcreuch, Mr. Leckie Ewing of Arngomery, Sheriff Baillie, Mr. A. S. Stewart Nicholson of Carnock, &c., &c. Deputations were present from the Highland Society, including Mr. Sprot of Garnkirk, Mr. Gibson of Woolmet, &c.; and from the Royal Improvement Society of Ireland, consisting of Mr. Thomas Cook, Kildare County, and Mr. John Adare, Queen's County, and from the North and West Agricultural Society of Ireland, &c. Several distinguished agricultural foreigners from Germany, &c., were also present. Of these were—Ludwig Johanssen, Holstein; Julius Diestel, Holstein; and Ludwig Feddersen. The Rev. Patrick Bell, the original inventor of the reaping machine, was on the field throughout the day, and so were Mr. Charles M'Cormick, and Obediah Hussey, the American patentees. Mr. Pusey, who intended being present, was, we are sorry to learn, detained in Edinburgh from indisposition.

Owing to some misunderstanding, none of the machines were upon the ground at the hour appointed—namely, seven o'clock in the morning. The committee therefore agreed to defer the time of commencing to half-past nine, although the whole arrangements were otherwise complete at the time mentioned. This to many present was a disappointment, and a still greater one followed when it was found that of the twenty-one machines advertised and entered to start, only seven came forward, and that none of these presented any new feature.

Lots being drawn, the machines were numbered as follows:—

No. 1. Mr. Cochrane's Bell's improved.
No. 2. Mr. Hope's (Stirlingshire) Bell's improved.
No. 3. Mr. M'Cormick's, managed by Mr. M'Kenzie.
Mr. 4. Mr. M'Laren's Dray's Hussey.

No. 5. Mr. Robertson's (Bowhouse) Bell's Crosskill.
No. 6. Mr. Hussey's own; one horse.
No. 7. Mr. Bell's own Crosskill, managed by Mr. Love.

The first trial took place upon a piece of oats; the crop light, the soil level and rather soft. The crop was slightly laid to the southwest, the wind blowing from the southeast—thus giving a tolerable test of the powers of the machines. All were started together by ring of bell: Mr. Hope's (No. 2) and Mr. M'Cormick's (No. 3) taking the lead, and Mr. Crosskill's Bell's (No. 5) last; but, after a few rounds, the great width taken by No. 7 proved more expeditious than fast travelling. This was undeniably exemplified by No. 7 being first done, while there was little doubt about the superiority of the work.

Owing to a defect in the delivering web and general ill-construction of No. 1 (Mr. Cochrane's imitation of Bell's), it was withdrawn—thus proving the great imprudence of a person taking a machine to a public trial without first ascertaining whether it would really work or not.

Mr. Hope's (No. 2) Bell's by Crosskill worked pretty well, making fair work; although, from his not having put on his cutters properly, the horses were heavily worked; after Mr. Love had arranged the cutters for him, his machine did well.

No. 3.—Mr. M'Cormick's machine had an accident, through the horses taking fright at the noise of the driving machinery, and broke a piece off the end of the pole; another pair of horses had to be put to it, when it cut to the satisfaction of all present; but the delivery was very unthrifty, although performed by Mr. M'Kenzie, brought over from America for the purpose of managing the machine. Mr. M'Cormick himself was also on the ground superintending the trial.

No. 4.—Mr. M'Laren's Dray's Hussey did not do its work well when cutting with the wind—thus proving the great utility of the reel over the rake wielded by a man, for the purpose of bringing the crop to the cutting apparatus and laying it on the machine for delivery.

No. 5, Mr. Robertson's Bell's, by Crosskill, made excellent work, running Messrs. Bell and Crosskill's own very close for the palm of merit; but from his manager taking his swathes too narrow, time was lost unnecessarily.

No. 6, Mr. O. Hussey's own improved one-horse machine, went on for some time well; but owing to the wind and lie of the crop, it was obliged to take to cutting only one way, returning idle; it also proved too much for one horse. It cut beautifully when cutting *against*, but very indifferent *with* the wind and the lie of the corn.

No. 7, Messrs. Bell and Crosskill's own, was only two minutes within being shut out, the start taking place before they had even time to oil the machine; but from the cool and collected way it was managed, it was soon evident it would be done first: with a great saving of walking, and consequently of work, to man and horse, the cutting and delivery were to the satisfaction of all present, though rather severe work upon Mr. Bell's two nineteen-year-old horses working it.

The next trial took place upon another lot of oats in the same field, each machine going and returning on the same piece. Here again Messrs. Bell and Crosskill's excelled; the other Bell's making good work, McCormick's cutting beautifully, but the delivery deficient, as before. Both of Hussey's worked indifferently.

The third trial took place on a piece of wheat in the same field. A heavy crop, but mostly standing, where the results were pretty much the same as in the oats.

The fourth trial took place in a field of barley, where the land was beautifully prepared in every respect for cutting by machine; the crop was much laid, and a thick plant of grass seeds amongst it. Here all Bell's machines eclipsed the others in every way; the work was first-rate, and called still more strongly forth the praise and admiration of all lookers-on. Here McCormick's worked worse than usual, but we could not ascertain the cause. Both of the Hussey's also worked worse than we expected.

The fifth trial, which we may designate the tug of war, was in the field of beans and peas mixed—an immensely heavy crop, and green, standing above five and a-half feet high, and thick on the ground. Here it was generally believed by both the judges and lookers-on, all the machines would be set fast; in fact, the only person who felt any confidence was Mr. P. Love, who volunteered to cut an avenue up through the field, which he did cleverly, with but one stop to clear a quantity of peas that had gathered on the canvas, and were held on by the standing crop; he came back again in splendid style, clearing fully twelve feet at the bout.

No. 5, Mr. Robertson's Bell's, next followed up, but made several stops, owing to the jack-chain that drives the reel giving way, thus proving the superiority of the leather belt used by Bell and Crosskill in the last lot of machines turned out by Mr. Crosskill. No. 5 did not return. Then followed No. 3, Mr. M'Cormick's, with two men struggling to make a delivery, which was very rough, and, owing to its being set rather low, and the driving wheel getting into a low place, the machine took the ground, and had to be raised; after which it cut to the end, but did not return.

No. 2, Mr. Hope's, overtook M'Cormick's, and waited his time, following him in gallant style to the end, where its web got entangled with the machinery, and was made useless for the time; it therefore could not return.

No. 6, Mr. O. Hussey's, next followed, cutting in a very fair way, but the delivery was rather rough.

The machines were again ordered back to the barley, to cut across the furrows.

No. 7 was ordered to take the lead, and cut right through the standing crop, which was done in a beautifully straight line, without a stop, to the complete satisfaction of all parties.

Then the other Bell's machines followed, with equal success where properly managed.

No. 3, M'Cormick's, did rather better this time, but Dray's Hussey indifferently, while Mr. O. Hussey's made some pretty work where the crop was standing.

Here the proceedings of the day ended, when the

judges repaired to Stirling, to compare notes and join the Company at dinner, where it was universally admitted that the machines were quite equal, if not superior, to any hand harvesting.

The judges—namely, John Wilson, Esq., Edington Mains, Berwickshire; George Hope, Esq., Fenton Barns, East Lothian; Mr. James Stirling, C.E., Edinburgh; Mr. Young, jun., Burntisland; John Lockhart, Esq., land agent, Dunmore; Mr. M'Ewen, Blackdub, Stirling; Mr. William Henderson, farmer, Craigarnhill; and Mr. Alexander Young, land agent, Keir—after full consideration, gave the following award :—" The subscribers, having dispassionately examined the several machines this day exhibited, are of opinion that the first prize of forty pounds should be awarded to No. 7, Messrs. Bell and Crosskill's machine, and the second prize of fifteen pounds to Mr. M'Cormick's machine."

It is truly pleasing to find that the judgment of the farmers throughout Great Britain is the same (even under the varied circumstances of soil and climate) with regard to the merits of Bell's and M'Cormick's reaping machines. Further that it is the general opinion of the agricultural public that reaping by machinery is thoroughly inaugurated into our land, and fairly within the grasp of every farmer; this was clearly exemplified by the efficient way in which Messrs. Hope and Robertson managed their Bell's machines in the trial field, although they had only had a few days' practice.

LOCAL AGRICULTURAL SOCIETIES.

The lives of utilitarians, it is said, seldom produce any very absorbing interest. The even tenor of their way affords but little scope for the biographer, and as little attraction for his reader. The very critics find small food for discussion in such details, and are generally willing enough to let them pass away with a word to the excellence of the moral and the example they convey. The hero, or the agitator, may easily excite our enthusiasm; while we can regard the routine course of simple industry with all-becoming equanimity of spirit.

The different agricultural associations are gradually coming to this. Those that yet survive the civil discord of the last few years are now necessarily returning to their original object, and leading once more the lives of peaceful utilitarians. There is no doubt, either, that so far they suffer, in some degree at least, from this sudden change. With the loss of excitement there has been a loss of attraction; and the palate misses the highly-seasoned meats of yesterday, over the more healthy but less curious fare now set before us. A few months back, a ploughing match or a local show of cattle was known to be something more than that merely sketched out in the programme of the day's proceedings. For this " something more," too, how many of us attended! The utilitarian ploughman, and his equally successful master, were but secondary considerations. We gave them, as in duty, the fair word of approval, and then hastened on to hear what the hero would do, or the orator could promise.

There are no such parts now for these leading characters in the performance. None seem to feel more than themselves how out of order their former "points" would now fall. Mr. Disraeli, with some dozen or two of London press men ready to relieve each other, and graft on the record his every word, renders their occupation light and agreeable enough. He has become simply utilitarian—confines himself closely to the aim of the meetings he attends, and gets terribly abused for not saying something more than he did. Mr. Henley, again, appears equally disinclined to commit himself. At Banbury this last week, his only text word is the show of stock held there. On this he descants; on the future conduct of this he advises. There is not an exciting word, not an inuendo of former times to be tortured out of the whole of his address. His audience hear him with the calm approval of philosophers; while the critic passes him over in something like disgust, as a man who is leading a very proper life, and fulfilling his duties as a country gentleman, with a very irritating regard to the propriety of his position.

To this, however, it is come. The local agricultural societies will now have to depend entirely on their own merits and attractions; it is so requisite for the directors of them to look carefully to what these are, as well as to how they may be increased. A country society at present generally makes out a day's meeting in something this way—a ploughing match, a show of stock, and a dinner: one of the chief features at the last being the distribution of rewards for good conduct to labourers living within the locality. It will be seen that in this arrangement the farmer himself has but one direct interest, and that is in the prizes for cattle. There are few features in a district meeting that vary so much as this. At some, the competition will be great in numbers and close in excellence; at others, if not in every way poor, success will be monopolized by some two or three breeders, against whom the neighbourhood knows others can have but little chance of distinction. The stock show at Banbury, it seems, was in every way indifferent. Mr. Henley attributes this to the influence of other societies, having wider limits, and greater celebrity, on exhibitors. If this be true—

and we are inclined to think that many of the more eminent of our breeders do not attach much importance to these little fish—an agricultural society should have something further to invite us. Though a doomed implement, the plough may yet for some few seasons afford a fair test for the skill of the labourer. His good conduct may be, as it is now, approved and encouraged equally to our satisfaction—the working man's interest in such a society is so well attended to. Let us see if something more may not be done for his employer, and again, even for *his* superior.

In the *Mark Lane Express* of last week was given a brief, but at the same time very perfect, report of the meeting of the East Cumberland Agricultural Society. This, it will be found, was furnished almost entirely by the gentlemen who acted as judges, and who themselves gave a stamp and authenticity to what they had done. Might we not more generally imitate this feature in the proceedings with advantage? It is not, however, to this that we would now more especially call attention. In addition to the prizes for stock—which on this occasion, at any rate, brought some very strong entries—there were other premiums of a description at present, we believe, better known in the north than the south. They speak for themselves:—

"Premium of £10, offered by the Right Hon. the Earl of Carlisle to the tenant farmer, in East Cumberland, who can produce the best general stock of all kinds necessary to, and kept upon his farm."

"Premium of £10, offered by the Right Hon. Sir J. R. G. Graham, Bart., M.P., to the tenant and resident occupier of any farm of not less than 150 acres."

"The society's premium of £4, added to a sweepstakes of 1 sov. each, for the best crop of turnips, not less than 8 acres, on a farm above 150 acres."

"The society's premium of £3, added to a sweepstakes of 10s., for the best crop of turnips, not less than 5 acres, on a farm under 150 acres."

"Premium of £2, offered by Mr. Jobling, for the best crop of turnips, not less than 5 acres, grown by guano."

Although the entries for some of these prizes were not numerous, we cannot but suppose that the competition must have added much to the interest of the meeting. Both landlord and tenant became almost alike concerned in the trial, as both must feel anxious for, and proud of, any superiority allowed to the lands shown. With judges, however, that give reasons for what they do, and avail themselves of the opportunity for recording what they see, the award carries with it something more than a local or merely official importance. Take, for example, these concluding remarks to the report in question:—

"In conclusion, we beg leave to remark that, through the district we have visited, we are of opinion that the wheat crop is below an average; that the crops of barley and oats are well fed, heavy, and good, and by the blessing of Providence, are likely soon to be secured in the finest condition. Turnips, though later than last year, give every indication of a fine and heavy crop. Potatoes, we are sorry to observe, are suffering from severe and extensive disease; the great breadth planted, and the near approach of the period of ripening, will, we trust, however, in a great measure counteract and mitigate the loss and deprivation to the producer and consumer otherwise to have been apprehended."

A further reference to this report, as published last week, will show how many valuable hints may be gathered by gentlemen duly qualified for the duties they accept, from an inspection of this kind. It will be found, too, that though beaten, the exhibitors were by no means disgraced; but that almost general commendation was given by the judges to those farms they were called upon to visit. This division of the prize-sheet reads, in fact, as full of promise; and we have now only to suggest that it should come a little more into common practice. Presidents, committees, and secretaries, who feel they want some new attraction, may here command one. There is nothing either of an artificial or falsely exciting character about it. With all the additional interest such a feature would tend to give our agricultural societies, it would come in strict conformity with that utilitarian object upon which they were originally established.

EAST CUMBERLAND AGRICULTURAL SOCIETY.

The annual show of the East Cumberland Agricultural Society took place on the Castle Green, Carlisle, on Saturday, the 17th Sept.

The dinner was held at the Bush Inn, in the afternoon. Philip Henry Howard, Esq., of Corby Castle, presided; T. Salkeld, Esq., of Holme Hill, in the Vice-Chair.

After the cloth was removed, Mrs. Howard, of Corby Castle, accompanied by the Right Hon. Emma Lady Petre, the Misses Dykes, and Miss Aglionby, appeared in the gallery, where they remained during the principal part of the proceedings.

After the usual loyal toasts, the Chairman gave "The Lord-Lieutenant of the County," as a very enterprising improver of the soil; for, as his friend Mr. Howard, of Greystoke, had once told them, he had laid down nearly 2,000 miles of draining tiles. (Hear, hear.)

The CHAIRMAN afterwards, in returning thanks for the enthusiastic manner in which his health was drunk, said—When he was called on to preside on the present occasion, he had accepted the invitation with a feeling of great reluctance and great embarrassment. When he looked back at the very able presidents who had occupied that chair on former occasions; when he recollected that at the same meeting it had been filled by the Right Hon. Baronet Sir Jas. Graham, a renowned statesman, and an able agriculturist; when he recollected it had also been filled by his noble friend and kinsman, Lord Carlisle, a nobleman distinguished in different walks of literature, and well known to all present for his high attainments; when he recollected also it had been occupied the time before by Lord Lonsdale, one who had been long known for

his earnest habits of business, and his general attainments, he felt that something like an invidious comparison might be drawn between their present very inefficient chairman, and those he had named. ("No, no.") But he had depended and counted largely on their indulging favour, and much also on the sterling worth of the cause which they were met to celebrate. (Cheers.) He thought they had no reason to blush at the exhibition of the present year. He understood from many who were able to give an opinion that it had been seldom rivalled in this county. Some gentlemen might have regretted that in some kinds of stock there was not a greater variety displayed; that in the class sheep, though they saw Leicesters, and very good Leicesters, they missed their usual swarthy rivals, the South Downs; and that they did not see the Herdwick sheep, which were so celebrated in some parts of Cumberland. He hoped that on future occasions that in that branch the competition might be a little more general. In the department of horses they saw a very good show; and when they recollected that at the meeting of the Royal Agricultural Society at Gloucester the show in that branch was scanty, he trusted the farmers of Cumberland would be animated to fresh exertions, for there was every reason to think that in the selling markets they would find a very good demand for saddle horses, which he understood were now both scarce and dear (cheers). The prospects of harvest in this part of the country were gratifying, he believed, compared with many parts of England. He knew that in the south and west of England the prospects of the havest were far from cheering. He believed that in Cumberland they might reasonably count on a very good crop of barley, and a fair average crop of oats, and though the crop of wheat might be rather deficient he believed that so far as it went it was of a quality to remunerate the agriculturist (cheers). There were many reasons why they should devote themselves to the cultivation of the soil and the extension of their resources. If a part of Europe should be engaged in war, the source from which we should be able to draw our supplies would be necessarily in some degree limited. But he trusted that when they were obliged to import they should find in some of their colonies, in some of the daughters of England, if he might so term them, sources from whence they might derive their supplies. He believed that in Canada, which now supplied but one-eighth of what was required, a very large breadth of land was under cultivation, and that before the year 1858 it was calculated that from Canada alone—from the subjects of the British crown—we could derive what was necessary to supply our vastly increasing people (cheers). There was another subject which it was difficult to handle with any degree of delicacy, but one which at an agricultural meeting they should not omit. There was an old Scotch proverb that "muck is the mother meal" (laughter). Now Lord Palmerston had said elsewhere that dirt was only something in a wrong place (Hear). He (the chairman) trusted that they should be able to increase the productive character of the soil by turning to account that great quantity of animal refuse which arose in towns, and that the sewage of towns might be made available for the fertilizing of the country (cheers). And here chemistry came in, and by means of its art the source of production was deprived of much of its noisome character. By means of disinfecting fluids it had been shown by some of the blue books, and also by some of the writers of the present day, that we could render these sources of productiveness available; and he trusted that his friend Mr. Rome might not be criticised for resorting to Carlisle to increase the value of his farm, and that he would not be deterred from laying every available source under contribution (Hear, hear). At the same time it was only fair to the passer-by that those who drew their manures from that source should at the same time put the resources of chemistry into operation (Hear, hear). He had heard with delight the prospect that had been opened out of meeting here the great Agricultural Society, and he trusted that in the race of competition the agriculturists of Cumberland would not be behind. He knew that the regulations of this society were liberal in their character, for several Scottish farmers had gained prizes to-day. They knew that, by the rules of the society, all within thirty-five miles of Carlisle were entitled to compete, and he was sure the agriculturists of Scotland who came within the radius of that limitation would ever show themselves worthy of the ingenuity of their countrymen (Hear, hear).

THE FOOD OF THE PEOPLE, AND WHERE WE MAY LOOK FOR FURTHER SUPPLIES.

We can hardly subscribe to all the conclusions of the article from the "*Toronto Daily Leader*," which appeared in the columns of the *Mark Lane Express* of the 12th current, on this topic, for various reasons. Its deductions, relative to the exports of wheat from Canada, are probably not very far from a fair approximate estimate; but when it takes up those of the United States, it is obviously otherwise, for when colonization is increasing more rapidly in the latter than in the former, and when an increase of colonization is the cause of the increase of exports from Canada, it certainly follows that the greater increase of colonization of the Union should produce a proportionately greater increase of exports. Either such is the case, or some satisfactory cause exists to prove the contrary; but none being given, the natural inference is that none exists.

The statement, "Experience has shown that, unless stimulated by 'famine prices,' the United States will not send to the English market more than its ordinary quantity of about 11,000,000 bushels of wheat yearly,'" is one which requires explanation, being founded, we believe, on exceptional data; for to limit a country possessing such unbounded territory, and such facilities for growing and exporting wheat—ten times greater than Canada—to a million and a half of quarters annually, is neither more nor less than absurd, under every possible view which can be taken of the facts of the case.

In arriving at such a sweeping conclusion as this, it may not be improper to notice, in passing, that we are the son of an "American Laird," and pretty familiar with the facts of the case on both sides of the St. Lawrence.

The above quotation, however, is in some measure qualified by the expression "*unless*" "*famine prices*,"

and what follows, limiting the period of "experience" to the last four years. "The increased demand of England for breadstuffs," adds the writer, "has been supplied during the last four years without any additional exports from the United States." This latter quotation is plain enough, free from all ambiguity, and we have no objection to concede thus far to conclusions; but the export of breadstuffs, and the export of wheat "in bushels," may be two different things; and both may be very different from the growth and consumption of wheat by the Union, and its capabilities of exporting breadstuffs, at fair remunerating prices, to England this year; and, as for "famine prices," it sounds somewhat technical in an old farmer's and corn merchant's ears—for it admits they (the States) have plenty of corn, but will not give it at less than starvation prices (?)

We are far from wishing to insinuate that the "*Toronto Daily Leader*" has inserted in its columns a loosely written article, calculated to mislead both the farmers of England and America *intentionally*, much less to throw any obstacle in the way of our transatlantic friends getting a fair price for their breadstuffs.

We were just long enough in the corn trade to learn that whenever speculators wished to get rid of a large stock of corn, whether in granary or in floating cargoes, &c., &c., *up got the price* (if possible), through the instrumentality of "*famine*," "*starvation*," and the like —means which seldom fail of inducing many farmers to hold on until millers are prepared to catch at the bait. We hardly ever recollect of such a stormy period of foreboding as the past month or two among housekeepers and bakers. What between war in the East, and bad harvest weather at home, words almost fail when we come to a literal construction upon it.

We are not here saying that the late extensive imports of 88,833 qrs. of wheat, and 123,790 qrs. of oats in one week, were the result of Mark-lane speculation. The most that we do is to point out the singularity of the facts of the case — facts which speak for themselves, proving beyond a doubt that larger stocks of wheat, &c., are forthcoming than some farmers probably imagine. It requires a sharp out-look at all times to watch the machinations of the corn trade; and although the late corn-laws, which afforded so much opportunity for speculation, are no more, yet that is no guarantee that the ninety-and-nine nostrums of the trade shall not now be as actively engaged as ever, working in new channels with which many are as yet less familiar. But we are rather wandering from our text.

During the last four years, we have had more than an abundant supply of foreign corn. Prices have, consequently, been ruinously low for farmers, giving rise to an amount of grumbling and complaint, such as to call forth on one occasion the sympathy of the Throne. During this period, the poor farmers of the continent of Europe, Asia Minor, and Egypt had no alternative but to accept our prices, low as they were. Possibly Russian serfs may have fared a little better, and a little more have been consumed for the sake of hides and tallow; but causes of this kind had little influence upon the general supply. Corn is a perishable article when once thrashed, and must be disposed of somehow. It is otherwise with the United States of America; for her farmers are more wealthy and independent, and if they cannot get a fair price for their breadstuffs, can convert them into beef, mutton, pork, and dairy produce, as we shall by-and-by more fully see.

The reason, therefore, why the farmers of the Union have not exported more corn to England during the last few years, is a very tangible one to every citizen (too few dollars)—one which they are just as much alive to as the farmers of England; but this reason is certainly no argument that no increase will be exported at our present prices. The parties who exported their corn during this time, were those who had not means of turning it to better account. If we assume that 50s. is the turning point, above which the American farmer cannot profitably convert his corn into live stock or dairy produce; that the price realized during the last four years was 45s.; and that during the present it will be 55s., then it ceases to be a problematical question as to what course the Union will take with her surplus breadstuffs.

In the United States, as our readers are aware, the inhabitants live partly on wheaten flour, and partly on Indian corn. When wheat is cheap, little Indian corn is consumed, it being then given to cattle and pigs; but when dear, a larger quantity is used in various forms, cattle then having to shift for themselves, which they easily do over the principal number of the States. What quantity of corn has been consumed by cattle during the last few years, which might have been imported to England under different prices, we have not the means of knowing—none exist; but we do know from indubitable sources that it has been considerable and is greatly on the increase. The practice only commenced in 1830, as we shall soon see.

The hypothesis above advanced may doubtless be objected to. It may be said, for instance, that the United States cannot import us more wheat at 55s. per qr. profitably, and that the high prices of 1847 may be quoted in proof of this notion; for although wheat ran up to the enormous price of 100s. per qr. in England, yet little more than an average import of the cheap years, when it was under half this figure, was obtained from the Union to supply our consumption that year. Hence the conclusion.

The short supply of 1847 from the United States can be otherwise accounted for; so that the evidence here advanced in proof of the objection falls to the ground; and hence the objection itself.

For several years past, American agriculture has been undergoing a revolution—throwing off the old out-and-in field system of this country, and adopting that of her alternate and mixed husbandry. This change has been more particularly active since 1845, and by 1847 the whole Union was on fire, so to speak; for it was then from statistical information discovered, that

a vast area of her old lands, which yielded, when broken up, from 30 to 40 bushels of wheat per acre, had been so exhausted as to be yielding only from 5 to 10, and that the States had sustained a loss *in toto* equivalent to the National Debt of England! Their farmers almost unanimously at that time became convinced that by keeping more sheep and cattle, more corn could be grown on one-third of the land than the whole then yielded, and took the necessary steps for carrying their convictions into practice.

Now every farmer is aware that a change of this kind is a work of some time, and that at the commencement less corn will be produced. It would take, for instance, four years to go over the land with manure, where a four-course shift was adopted, and that a short crop would be harvested the first year. The fifth crop of the new system may double the penultimate crop of the old, and the ninth triple it.

But to illustrate the example more forcibly, let us suppose the arable lands of the Union 100,000,000 acres, originally yielding 30 bushels, but now reduced to 10. Now according to the old system 50,000,000 acres would first be broken up, cropped so long as they would crop, and then thrown down to grass, when the other half would be broken up. The total produce would be 500,000,000 bushels. On the new, two plans may be adopted in introducing it:—1st, one-half the exhausted land may be manured, and sown with green crops, so that the produce of corn would remain nearly the same; 2nd, half the break in corn might be manured, and sown with green crops, leaving half the produce. The mean between the two, or one-fourth less land under crop the first year, may be taken as the rule. If we further suppose that the first manuring restored the land to 20 bushels, and the second to its original fertility—30, then the fifth crop account would stand thus:—

	Bush.	Bush.
25,000,000 acres wheat, at	20 =	500,000,000
25,000,000 acres corn, at	75 ,,	1,875,000,000
Ninth crop thus:—		
25,000,000 acres wheat, at	30 =	750,000,000
25,000,000 acres corn, at	100 ,,	2,500,000,000

Penultimate crop of the old system thus 500,000,000 bushels, as already stated.

Such are the two systems, and their results, without taking into consideration the increase of value of the remaining 50,000,000 acres yielding live stock; and when we look at the fact of the Americans giving £1,000, £700, £500, £300, &c., for individual bulls and cows, as they lately did at the Tortworth sale of Ducie shorthorns, to improve their breeds of cattle, it is manifest that they begin to realize something considerable from this source.

Now, if there are any of our readers who think that the United States cannot or will not send us more corn this year than they have been doing for the last four, unless at famine prices, they know more of American agriculture than we do, and we have a right to know something. The fact is they (the States) are preparing to send us a very large increase, not only of breadstuffs, but also of salted provisions. They just find that, by an improved system of agriculture, they can ultimately send us, off the same area of land, an increase, according to the above tabular data, of 250,000,000 bushels of wheat, 2,500,000,000 bushels of corn, besides an increase of salted beef, pork, and dairy produce. It may be some time yet before the American soil is restored to its original fertility, for many farmers know from dear-bought experience that it is no easy task ameliorating exhausted lands. It is even no less a task to get the farmers of the New World to lay aside their antiquated practices than it is to get the farmers of the Old to lay aside theirs; for some are only yet beginning to talk of guano; others to apply it; but, generally speaking, the work of improvement is making rapid progress, and although it does not become us to say much of American intelligence, enterprise, and assiduity, we may yet be allowed to mention that facts already begin to speak for themselves, proving to England and the world that nothing will be allowed to interrupt its progress until brought to a successful termination—*the Union restored to her original fertility.*

In 1847, therefore, the American farmers were so situated between two systems of agriculture that they could not send us more breadstuffs; for several years prior to that period, their attention had been turned to the necessity of such a change, before they could even continue to supply the Union, let alone England; while the free-trade movement of the latter in 1846 removed all fears as to the policy of investing fresh capital in land; but they could not invest their capital and labour in both systems. The old system was to rob the States to feed England; and, therefore, it was thrown overboard. The new system is to enter upon a new lease of an exhausted farm, as it were. Now many farmers know from experience, that in cases of this latter kind, the first rent comes out of their own pocket: America, however, owed England no rent; and, therefore, she kept her Californian dollars to improve her exhausted acres.

Our Canadian colonies are also adopting an improved system of agriculture. In this respect, they are not so far behind their southern neighbours as in commerce; and, if the railroads now being formed were opened, a very strong effort at advance will be made to develope their productive resources.

The actual progress which America has made, and the increase of produce we may this year expect, supposing prices to remain at their present level, are questions we have not the means of answering satisfactorily. All that we do know is, that very favourable accounts have been received, both from the States and Canada; that both are rapidly progressing in one improved system of agriculture; that the former is certainly not falling behind the latter in the march of improvement, nor the latter in point of home consumption. The statistical returns for the Union, it must be admitted, are yet far from correct; those from Michigan are supposed to be among the best, and between 1840 and 1849 she rather more than doubled her produce; the wheat grown in the former year being 2,175,108 bushels, and in the latter, 4,739,300; other

grains, 1840, 4,666,720 bushels; 1849, 8,179,767. The following statistics of the value of the exports of breadstuff crops, 1847 and 1848, reported to Congress in 1848 and 1849, stated in dollars, will show the general increase of produce, as well as the progress of agriculture, in the Union:—

	1848.	1849.
Beef, tallow, hides, & horned cattle	2,474,208	2,058,358
Butter and cheese..	1,063,087	1,654,157
Pork (pickled), bacon, lard, &c.	3,883,884	9,245,885
Wheat	1,681,975	1,756,848
Flour	11,668,669	11,280,582
Indian corn	1,186,663	7,966,369
Indian meal	945,081	1,169,625

The falling off in beef and flour, and increase in pork and Indian corn, clearly develope a change of farming, as will be seen from the next paragraph.

The question has yet to be answered—If the United States are increasing their produce, what are they making of it?—which is easily done, for they are converting it into cattle, sheep, and pigs, as formerly stated, to consume the increase of produce on the 50,000,000 acres in seeds and green crops, according to the data formerly assumed. To stock the above area of land with "Grand Dukes" and "Duchesses" is a problem becoming a great nation to solve—one which the Americans are now solving—with energy and zeal. So far back as 1830 they discovered that Indian corn could be more profitably converted into beef and mutton, and driven to distant markets on its feet, so to speak, than in the usual manner, when under a certain price. The above table shows that fewer cattle have been slaughtered, and hence more reared—that more barley, peas, and Indian corn have been grown, and more pigs fattened. The increase of pork alone is equivalent to an increase of 5,000,000 bushels of wheat. The increase of dairy produce is another significant item. In some of the States, again, the increase of cattle and sheep is very remarkable. In 1840 there were in Michigan, for instance, 99,618 sheep, yielding of wool 153,375 lbs. In 1849, 610,563 sheep, wool 1,645,756 lbs., being an increase of 1 lb. of wool per fleece, besides 510,045 head of sheep. In Ohio, in 1847, cattle, 900,162; 1848, 983,822; 1849, 1,058,933, giving an increase of 158,771 head in two years, or 17½ per cent. Sheep: 1847, 3,365,025; 1848, 3,677,171; 1849, 3,911,836—giving an increase of 546,811 in two years, or 10⅔ per cent. Hogs: 1847, 1,757,318; 1848, 1,879,689; 1849, 1,947,472—giving an increase of 190,354 in two years, or 10 4-5ths per cent. Many important deductions might be drawn from the above, did our limits admit, but facts must be allowed to speak for themselves.

The last few cheap years in England have been greatly in favour of the agricultural improvements now taking place in America; for, if prices had been high, many of her farmers would have been induced to have sent us corn, robbing their own lands, and rendering them less productive than they are this year. The same progress could not have been made in improvements. We therefore arrive at the conclusion, that the small imports of the past is an index of a greater supply for the future, and that we shall this year have a larger import, both from the States and Canada, than usual.

In conclusion, we have thus endeavoured to glance at the agricultural resources of America, showing that our colonies are laudably preparing themselves in the most efficient manner to supply the increasing consumption of the mother country with breadstuffs, butcher meat, and dairy produce, when the old States of Europe may possibly have enough to do to supply themselves. We have also very briefly taken a passing notice of some of the anomalies of the corn trade. It is surely time, when corn merchants are striving to make fortunes, that farmers also bethought themselves of "making hay while the sun shines." The old maxim—"To thresh as fast as live stock requires the straw for consumption, and to sell corn as fast as threshed," is likely to be a golden one this year, and therefore we recommend it to the peculiar notice of our readers.

DISEASES IN ANIMALS—PLEURO-PNEUMONIA.

The recurrence of cholera in the human species at given periods is nothing more than what happens to the brute creation at several stages of their existence. Epidemic, endemic, and contagious diseases break out in the animals over which man has subjection, which defy the pathologist and the physician to unravel either the cause or the cure, and which seem to run riot at periods as certain as the plague, the cholera, or the yellow fever amongst human beings. We have had three very fearful specimens of these visitations amongst our stock during a very recent period, which have been the source of as much anxiety and loss to the grazier as the late depression in prices has been to the tillage farmer.

The first epidemic was termed the foot and mouth disease; and though not absolutely dangerous to the life of the animals, produced such a loss from inability to eat—from fever and from foot lameness—that the profits of many a grazing farmer were altogether swallowed up in a single season. This disease attacked the sheep, and in many cases the pigs, of the country; and a vast loss of animal food was the result. Whether the malady was introduced by foreign stock or not may be an open question; at any rate, it appeared simultaneously with them, and it doubtless destroyed as many pounds of animal food here as were imported from abroad.

Then followed a far more destructive disease, called the "lung complaint," under the elegant and

classic cognomen of the pleuro-pneumonia. Some idea of the extent of the losses which took place by this disorder may be imagined when it is remembered that it nearly ruined the prospects of two cattle insurance companies, who had made calculations accurate enough for ordinary cases, but which their new foe bore down with irresistible fury; so that their resources were almost swamped by its fearful depredations.

Visitations of this kind are nothing new. They are amongst the providential arrangements made for Nature's governance by the great First Cause; and though man may palliate and medicine may relieve, still a great scourge will now and then sweep over a class of animals or plants—whether the ox, the sheep, the vine, or the potato may at one time or other be the subject of its virulence.

Commencing with the grievous Egyptian plague, in which all the cattle of Egypt died, down to the siege of Troy, when an epidemic destroyed the cattle of the Greeks—as in the days of Romulus it did those of the citizens of Rome, being followed in 810 by a complete destruction of the cattle of the great Charlemagne. History is, however, vastly more precise in mentioning the "murrain of 1711," which seems to have commenced in cattle which had travelled from Dalmatia.

It is a remarkable fact that the only alleviation of this disease is by inoculation. It seems to be a gentle mode of getting over the difficulty, and is in numerous instances attended by complete success. On the sheep-pox it has a most beneficial tendency; and some of the experiments made on the pleuro-pneumonia are of a very encouraging, though somewhat mixed character.

An interesting paper on the subject was presented to the House of Commons last session, being an abstract of experiments made by Dr. Willems, of Hasselt, in Belgium, addressed to the Minister of the Interior. In Belgium, this disease appeared first in 1836, and Dr. Willems made several experiments to check its ravages, but did not succeed according to his wishes; and hence he commenced the *inoculation* of sound animals with the diseased matter from the lungs of others, and so attempted to prevent what he was unable to cure. The following is the detail of M. Willems' method—

"M. Willems performs the inoculation on the upper and under surface of the extremity of the tail, by means of a lancet in the form of an ordinary eraser. The skin is pierced with the point of the blade of the instrument charged with virus; a rotary movement is then given to the instrument, and the operation is completed. The matter for inoculation is obtained from beasts in which the disease has not reached its last stage. The most convenient subjects are those which are to be met with in the slaughter-houses, and the hepatised lungs of which show that they are affected with the disease. The hepatised portion of the lungs is squeezed, and the sero-sanguinolent liquid which flows from it constitutes the virulent matter fit for inoculation. The consequences of the operation become manifest at the end of from two to four weeks by the swelling of the tail and the reactionary fever. The succours of art other than hygienic regimen are superfluous, unless at least the two phenomena indicated should take a certain intensity. In this case the tail is suspended; it is bathed with emolient lotions, and, if mortification appears threatening, some incisions are made in it. Mortification of the tail sometimes makes its appearance, especially when the matter for inoculation is taken from animals that have sunk in the last stage of pneumonia. It is not mortal. The worst that results from it is the loss of a portion of the caudal appendage. And in additional instructions to these doctors, they are recommended 'not to lose sight of the fact, that M. Willems considers that the cases which supervene within a fortnight from the inoculation are not to be taken into account in appreciating the results of the process considered as a preservative measure against pleuro-pneumonia.'"

The above are from the instructions of the Government to the veterinary surgeons employed to test the doctor's methods.

It is but right to state that Professor Simonds has not had much success in the trials of the system, or of some similar one he has made in this country; but we still think it is but fair that these foreign experiments should be fully placed before those so much interested in the lives of cattle, and in this important means of producing the most concentrated and invigorating of human food. M. Willems gives the following result of his experiment—

"For my own part, I have inoculated at least 600 animals since the delivery of my memorial to the Minister of the Interior, and have met with no accident; so far from it, I have the satisfaction of telling you that all the animals that I have inoculated have been preserved from pleuro-pneumonia. Pleuro-pneumonia has raged with great intensity all the year in the stable of MM. Nys, distillers, at Hasselt. On the 29th of April, I performed my inoculation upon forty-five individuals of the bovine race, and not one up to the present time has been diseased. Thirty others were left uninoculated, and four of them have already gone out diseased." On the 26th of that month he observes: "Let those gentlemen" —*i. e.*, the members of the Belgian and Dutch Commission—"who, about five weeks ago, met with diseased animals everywhere, now come and see the state of affairs in those stables which they visited; and the Hasselt distillers will tell them that the disease has disappeared, as by enchantment, in proportion as the inoculations have been performed. Every week a considerable number of diseased beasts were supplied to the towns of Brussels and Liege from Hasselt —in future it will be no longer so."

Nor is this all; he gives evidence of the vast success of the plan in other places. He had nine hundred beasts inoculated, he says, in Hasselt, not one of which has died of pleuro-pneumonia, though others with them in the same house had died which had not undergone the operation; and at a later date, he reports to the Government Commission that, out of twelve hundred inoculated only one

had died of the disease, and this was imperfectly operated upon.

The operation does not appear to be of a very dangerous nature to the patients; five animals only, out of the nine hundred referred to above, had died of the inoculation. The unfavourable symptoms are thus described, and the treatment alluded to—

"The casualties which may succeed the operation performed with the necessary care, but which happen most frequently from the inoculating matter being in a state of putrid fermentation, are a considerable swelling of the tail, extending sometimes to the hinder quarters, and encroaching in certain cases on the neighbouring external parts. Then, most frequently, the animals lose a portion, more or less, of the tail, or even the whole of it. The most suitable measures for preventing the consequences of a too considerable engorgement of the tail and the other parts, consist in operating discharges at a convenient time, and favouring the separation of the diseased parts from those which remain sound. Some practitioners appear to have obtained excellent effects from the continued application of cold water."

For young calves, he recommends inoculation with secondary virus thus obtained—

"From ten to twenty days after inoculation the tail of the animal is swelled. I make therein deep incisions, from which blood flows. On the next day the edges of the wound gape, and at the bottom and on the edges there is a kind of lymph. I gather this lymph—I inoculate it."

The virus, it seems, can be held (like vaccine matter) for a considerable period, and we think it right to observe, in conclusion, that the Belgian Government look very favourably on the plan propounded by M. Willems, who appears to us to have been very successful in his numerous and interesting experiments.

THE EWE FLOCK: SELECTION FOR BREEDING, &c.

In my last paper I named only one or two points in reference to the selection of ewes for breeding, and their appropriation to each individual ram. I will in this article be more particular, and endeavour to show more fully the true principles upon which a breeder ought to act, to make the most profit from his *ewe flock*.

Immediately upon weaning the lambs, the ewes ought to undergo a very careful inspection, every animal denoting weakness from age or other incapacity should be removed from the flock, and placed upon the best keeping the farm will afford, in order to prepare them for sale. No animal of weak constitution, or showing signs of disease of any kind, or possessing any malformation in form or feature, tumours, or ulcers, should be kept for purposes of breeding; nor should any ewe, except for some special purpose, be put to the ram after the age of *five years* at furthest; but the more profitable course is to put them to the ram when shearlings, and sell them or feed them off at "three or four shears:" by such means the flock is kept up in greater vigour, possess stronger constitutions, and are sooner brought into full profit.

Every shearling ewe in the flock, not ineligible from disease, or other accidental cause, should be put to the ram: they will bring up a good lamb, and, as "two shears," are much more valuable for sale. By pursuing this course, a greater portion of the older ewes of the flock may be parted with annually, and those "two shears" not considered desirable breeders as stock ewes generally improve the lot of aged ones, and cause a much readier and more profitable sale. This is the North Lincolnshire practice, and elsewhere. Many objections however are made to this course: breeders do not like to breed from a small shearling ewe; but if a proper selection is made of the ram, a very good and profitable result will ensue. Small shearling ewes from a well-bred flock are merely so from incidental causes, and if put to a full-sized ram their produce will "come up" to as full maturity as the larger ones, and the ewes themselves in the meantime are improving gradually in size and in every valuable quality. Many respectable breeders use every young ewe: this is wrong—good judgment is required in all cases. It is a great point with most breeders to endeavour to obtain uniformity of form, feature, and wool throughout their flocks. This is good practice, and cannot be too highly commended; but, then, this form, feature, wool, &c., ought to be of the most profitable order consistent with the district in which it is bred. This is one great point for the consideration of every breeder, and deserving the most serious thought, but upon which my limits will not at this time permit me to enter: I merely throw it out in passing, not without hope of usefulness. Well, how is this uniformity to be obtained and kept up? *It may be obtained;* but it is the most difficult thing in breeding to be kept up, without great injury to the constitution (if I may so put it) of the flock by too close approximation in the breeding—too much of the "in-and-in" system of breeding. Selections of great similarity in form, in feature, and "in blood" must be made both of ram and ewe for this purpose: it may *thus be obtained*, but I have very grave doubts as to such a course being the most profitable; and if a change is made, it may perhaps be only "in blood," yet the produce will not fully retain the uniformity: the form, feature, and wool may be alike, but it will only be alike from accidental causes—the breed is not the same; the produce will somewhat vary. This course

is, however, the best—change the blood, but keep as near the original formation as possible; by doing which, a fair uniformity may be kept up, and the healthy constitution of the flock be maintained and ensured. Much, however, as I admire uniformity in a flock, I would by no means select my ewes or rams for this especial object. I want to breed the most profitable animal in every point for common service: all breeders cannot be breeders of rams: the major part breed for fattening, or for sale as store sheep; and it is to this point we want more particularly to come, *i. e.*, so to select and appropriate the ewes of the flock to the ram as to produce the most profitable progeny. My own practice is, to overlook my ewe flock very carefully before selecting my rams. Having chosen these according to my best judgment, in due consideration of the requirements of my ewes, I then at the time of putting them to the ram get the whole flock together, and the rams in an adjoining pen, and proceed to appropriate them to each ram as I think them best adapted to propagate the most useful stock. My great point or object is to keep up a good conformation throughout, and each defective point is noted in the ewe, and she is put to that ram most likely to correct it in the progeny: if both ewe and and ram are alike good and proportionate, then some minor point decides the appropriation; the improvement in the wool or "looks," or the size, or the offal; these matters are determined, and must ever be determined, by the best judgment of the breeder when the animals are all before him.

The Time of putting Ewes to the Ram. — This must depend very much upon the breeder's means. If he can make ample provision, and has plenty of warm shelter, so as to give full protection to his flock in the month of February or the early weeks of March, he may put his ewes to the ram in September; if not, he had better defer doing so till October. The period of gestation in the ewe is about five months; consequently the lambing season in the first case will be from the middle of February, and, in the latter, the middle of March. In the southern part of the kingdom I should prefer the month of September; in the northern parts, October: the month of November I think is too late: surely, provision may be made to receive the lambs before April and May. Early lambs, if properly taken care of, and well reared, are undoubtedly the best and most profitable. It is no trifle to gain a month throughout the flock.

It is a common practice with large flock-masters to put a number of rams to their whole flock of ewes, and allow them thus to run together. This course cannot be too severely condemned: it is unquestionably injurious to the flock and unprofitable to the breeder. Some other practice ought to be adopted to keep a separation, and would amply repay the breeder for any reasonable cost in fencing &c.: his lambs would repay him the first season; besides, the general improvement in his flock by careful selection, and by truer and more correct breeding, would be immense.

It is now becoming a general practice in some districts to use both the ram and ewe lambs for breeding purposes. This I think is wrong and censurable in both cases, but more particularly in the ewe lamb. In my own flock a ewe lamb will occasionally prove in lamb, which is readily told by her bad condition: and this she retains throughout the whole course of breeding and rearing, till at the close she is generally of very little value, and her lamb not much better. I think a ewe should be of from fifteen to eighteen months old before putting to the ram: she will then be near two years of age before bringing forth her first lamb, and, of course, has arrived at a good and healthy maturity, which is much more likely to be communicated to her progeny than that of a lamb whose whole frame and constitution is held back by unnatural breeding. The ram lamb, too, is generally seriously injured, not only in growth and frame, but in his powers of propagation.

The ewes should remain with the ram about six weeks. They will usually, if not fully impregnated, take the ram again at the end of three weeks; if the ewes at this period are taking the ram freely, it will prove him incapable, and he should be changed. It is a good practice to change every ram at the end of four or five weeks. A ewe will sometimes hold from one ram when the other has failed her, although he may be a sure stock-getter. During the season of "tupping" the ewes ought to be on good pastures: this is highly important, and requires more attention than is generally supposed. The better the keeping for a ewe in store condition, the larger the fall of lambs!

P. F.

TREATMENT OF FOOT-ROT IN SHEEP.—There is a disease, very incident to sheep, called the "foot-rot." For the production of the foot-rot, we must have soft ground, and it does not seem much to matter how that softness comes about. In the poachy and marshy meadow, in the rich and deep pasture, and in the yielding sand of the lightest soil, it cannot perhaps be said that it is almost equally prevalent, but it is frequently found; nevertheless, soft and marshy ground is its peculiar abode. The first symptom of the disease is the lameness of the sheep. On the foot being examined, a morbid growth is almost invariably found; the foot is hot, and the animal shrinks if it is firmly pressed. It is particularly hot and painful in the cleft between the two hoofs. There is always an increased secretion usually fetid, and often there is a wound in the coronet, discharging a thin stinking fluid; sometimes there is a separation of the horn from the parts beneath. In comparatively often cases, the hoof seems to be worn to the quick, at or near the toe. The lameness rapidly increases, and often to such a degree, that the sheep is unable to stand, but moves about the field on its knees. Of one thing the flock-

owners may be assured—that the foot-rot is exceedingly infectious; if it once gets into a flock, it spreads through the whole unless stagnated. The treatment of foot-rot is simple enough, even to the most ignorant, and it can be most easily cured by the following instructions: First · The foot must be carefully examined, and every portion of the horn that has separated from the parts beneath thoroughly removed; then apply with a flat stick the composition named below, giving it a rub. After the animal is properly dressed as stated, place it for three or four hours upon dry straw, and not on slacked lime as many propose, which ruins a great number; be sure and not let the sheep go amongst wet before the above time, as that will destroy the dressing, and support the disease. Dress the animals once in two days, but generally the first dressing will cure, except when the rot is gone to the nerve. Foot-rot composition, to be placed in an earthen vessel, and kept covered except when using:—Gunpowder, verdigris, blue stone, equal quantity of each; sweet oil and best vinegar, equal quantities, to make the powders like a stiff ointment. As soon as mixed it is fit for use.

ON THE BREEDING OF HORSES.

It has been said, half in joke and half in earnest, that an Englishman takes scarcely anything with so little equanimity as a reflection on his horsemanship. You may question his morality, impugn his professional skill, doubt even his commercial stability, and he will still bear with you. On one important point, however, he is, if not perfection itself, something yet very near it. In all that relates to horses—their breed, form, and action—he feels his own worth, and is ever prepared to respect it. There may be his superior in other pursuits; natural ability or lengthened experience may have so far told against him; while here, on the other hand, they speak equally in his favour. It might not always, perhaps, be pleasant to inquire too minutely into the premises upon which this character is established. The better plan is to stamp him at once at his own word. He is an Englishman, and, of course, he is a judge of a horse.

It is, indeed, but fair to add, that the world at large is very well inclined to take him on these terms. We may be a little particular as to the qualifications of some other of our judges—from the learned man who has gradually reached his seat on the bench, to the reverend amateur who weighs over the merits of a Dorking fowl—we are apt to look somewhat carefully into the real recommendations for the office. But the judge of a horse is born "ready made;" and in no class of society is his authority so certainly admitted as amongst agriculturists. If a man is a judge of a shorthorn, he must be a judge of a horse. We have known more than one selected from the justly-famed excellence of his flock; while, should he but have some experience in the points of a cart-horse, he becomes instanter, the arbiter over every sort sent into the yard. "Whether a hunter, hack, or racer," he is too often deputed to decide on them all—and decide he does too, his weak point as an Englishman at once assuring him of his capability to do so.

The reader of the *Mark Lane Express* must have noticed, within the last few weeks, some communications we have been favoured with on the breeding of horses. These are from gentlemen in every way qualified to deal with the subject they write on; independently of which, there is matter sufficient in the letters themselves to command our best attention. The English horse, take him in his several varieties, was never so good as he is at this present time. The thorough-bred horse, either for speed, courage, or form, was never so beautifully developed as we now have him. From him, too, we get the fountain stock of hunters that have yet more improved on what they once were. If our hacks are not quite as clever, it must be our fault rather than our misfortune; while the draught-horse was never bred with so much care and judgment, or with anything like such proportionate success.

And yet in the face of this, what poor exhibitions of the horse we are treated to! The Royal Agricultural Society, for instance—an institution that in other departments has effected so much for the cause—scarcely appears sufficiently to depend on a feature, that should be one of the most attractive in its catalogue. The show at Gloucester brought matters, we should hope, to a climax. There was scarcely one class amongst the horses that did common credit to so important a body. "Cecil" was "surprised," Willoughby Wood, clearly for some considerable time, disgusted. It is remarkable, moreover, how well they agree in what they consider has led to this failure. It is nothing more or less than that glorious fiction which makes every Englishman a capital judge of a horse. We are bold to say that in no department of the Agricultural Society of England has, comparatively, so little general care been taken as here. Anybody recommends anybody else as a judge of horses, and down his name goes accordingly. If "anybody else" had been asked to give his valuable services to the merits of the Southdowns or Devons, he might have hesitated, on the good showing that he doubted his own fitness for the office. But as it is

only horses, up he comes, of course—to condemn a thorough-bred hunter, pass a pure Suffolk, procure his first introduction to an Exmoor pony, or ready and willing for anything else the Society may require of him. The inevitable effect of all this is that the judges and the judged are gradually becoming worthy of each other; and gentlemen who gather their notions from such displays, get to be convinced that the English horse is sadly deteriorated.

We recommend the letters of our two correspondents, Cecil and Mr. Willoughby Wood, to the serious consideration of the Council of the Royal Agricultural Society. It will be found from these that it is not the selection of the Judges only that may be looked into with advantage. They may amend and enlarge this branch of their prize-sheet; encourage the entry of the best horses in their several classes, and render the award of the Society the distinction it should be. We repeat that we know no department in which the further labours of the Council are so much required, as none where at present they result in so little advantage.

There has been a great deal of wild talking and writing lately on the deteriorated condition of the English horse. The English race-horse, to begin with, is not the horse he once was. His very appearance shows you this. Compare the Beeswing of Herring, or the Canezou of Hall, with the magnificent and altogether perfect animals Stubbs and Sartorius delighted to portray! Again, observe how he has lost his lasting powers. The English race-horse now, like almost everything else in these sharp times, is brought to make the quickest returns. He does more really hard work before he is three years old than his forefathers did in a lifetime. The heroes of old—your Eclipses, and so forth—frequently never ran until they were five or six years old, and then accomplished in their two or three years' service some three or four races a season. The modern race-horse is in hand as a yearling; and his preparation alone is what few of our ancient masters would have dreamt of. "But still he has lost the lasting power." We sigh for the glories of the *temporis acti*—the four-mile heats that no thoroughbred horse could now face. Of course he could not. The proof of this is, again, easy enough, as we see him carry twelve stone over a stiff line in a steeplechase, and at a pace that would have choked the good old English hunter before he had gone half-a-mile—and the hunter, too, is so of course proportionately deteriorated.

For one man who did hunt, how many hunt now? Or, for one who *rode*—who called on the powers of his horse to fly instead of creep, and to race instead of canter—how many *ride* now? We reach the climax of all this in the cause. We learn from a work before us that the injury arises from the practice of now breeding thorough-bred horses "*too much in and in.*" Cecil, it will be found, answers this by a reference to the *Stud Book;* but surely so monstrous an absurdity carries with it the best commentary. Never was the science of "crossing" so well understood; and never was there such an opportunity for putting it into practice. It is practised, too; and despite the taste for speed alone, the pedigree of a thorough-bred horse far more often than not, exhibits an admirable union of the two qualities.

The work we have referred to—it has an outline of "Beeswing" on the cover: no doubt in evidence of our deteriorated condition—laments more especially the present state of our cavalry. If this be so bad, we take it to arise from one very simple cause. The Government is out-bid. They do not give prices good enough to get them good horses. Let any man go into a fair now, or see rather the strings of horses led out of it; and then let him mourn over the deteriorated condition of our saddle-horses. Let him mark the weight-carriers, the carriage-horses, and even the hacks, bound for dealers' yards, or foreign ports. The Government-agent has two strong opponents—the home and the foreign buyer. To these he necessarily succumbs, and bargains, like the boy in the street, "the last three for a penny!"

However, we are all to do better. We want *more* good horses, it seems; and who, then, but the farmer so well provided to supply them? And who so able to aid him here, as that Royal Agricultural Society which has already done so much for him in other branches of his profession? Together let them look to it. Let them be as careful in the *breed* and points of a horse as in those of a Shorthorn or a Southdown. In few trades will a better article command a better price.

SIR,—The second point to which I would call the attention of agricultural societies, if they desire to raise the character of their shows of horses above their present level, is the choice of judges. At present, at the smaller shows the same judges sometimes decide on the merits of every description of stock brought before them, from the horses down to the pigs. Not to waste comment on so palpable an absurdity, let us pass on to the consideration of the practice of our principal societies. Here, even, we find that one and the same set of judges have to decide on the qualifications of stallions for getting hunters, for getting roadsters, coach horses, and horses for agricultural purposes. They have next to pass in review mares and foals of the above classes. This accomplished, they make their awards on the three-year-old hunting colts, then on the fillies, and so on through

the other breeds, finishing with working horses, both old and young.

Now, sir, I maintain that there is scarcely one man in ten thousand who so thoroughly understands the properties and qualifications of all these varieties of the equine tribe, as to render his opinion respecting them of value or authority. For, be it observed, there is a wide difference between a fancy and a decision. The one is the mere offspring of individual partiality or dislike; the other is based on knowledge and experience. The decision of the *ex-officio* judges ought to be equivalent to the final verdict on the merits of the animals respecting which it has been pronounced. When the public voice pronounces that such is the general character of official awards, then will exhibitors feel confidence in bringing forward good animals, instead of being, as now, oppressed by the belief that "it is all chance." There is one method, and only one, of infusing such a feeling. Let the judges for the several classes of horses be selected for their tried experience in and proved knowledge of that description of horse on which they are to pronounce.

First, as to stallions for hunters, hunting colts, and fillies. The sire of a hunter ought always to be a thorough-bred horse. No man is fit to pass a decision on thorough-bred horses, who is not competently versed in the Stud Book and the Racing Calendar. The character of the family to which a horse belongs must first be considered. Is it famous or unknown? If the former, is it remarkable for speed or for endurance? Has it produced one star only, while the rest are mediocrities, or are its members noted for the certainty as well as for the merits of their performances? These are questions to which the answers ought spontaneously to occur to the judge. There is no fact more important to be borne in mind, in the difficult art of breeding, than the permanence of type which characterizes all well-bred families. As in the descendant of an ancient race we may not seldom recognize the fac-simile of some family portrait hanging on the wall, so when I have for the first time seen a celebrated horse, I have more than once thought for the moment that it must be his remote ancestor, with whose portrait I had been familiar, come to life again. It is not to be supposed, however, that every individual of the family will exhibit its characteristic traits. If this were so, breeding would, in skilful hands, be a certainty, instead of the perplexing and mysterious art it is. But a well-established feature does reappear with wonderful pertinacity, even after it has apparently been lost for a generation or more. This it is which makes the value of Stud-Book lore to the breeder. Of two animals, one belonging to a family remarkable either for stoutness of constitution and power of endurance, or for speed, size, and substance, the other to a race which although it might occasionally have produced brilliant runners, was generally weakly, undersized, hasty in temper, and uncertain in performance, I should give a decided preference to the former as a sire for hunters, even though he were less in size and inferior in many strong points to his competitor. As an example of the permanence of good qualities, when once firmly impressed upon a family by long and pure descent, take Orville, winner of the St. Leger in 1802. He was the sire of many first-rate horses; among which I will only mention Emilius, winner of the Derby in 1823, who in his turn was the sire of Priam, another Derby winner. Priam, besides being the sire of three Oaks winners, has left the traces of his sterling qualities in a surprising number of his more remote descendants, among which I may name Cossack, winner of the Derby in 1847, whose dam was by him; the Hero, whose sire, Chesterfield, was by him; and Weathergage, whose wonderful performances last year took the racing world so much by surprise, and whose sire's dam, Miss Letty, was a daughter of Priam. In another line, the celebrated mare Alice Hawthorne was descended from Orville; and so was Mulatto, a good horse himself, and whose progeny keep up the *prestige* of their forefather—as witness Bloomsbury; and on the female side Voltigeur and Frantic, both out of Mulatto mares. Besides these names of world-wide celebrity there were in Yorkshire, in the early part of this century, many country stallions, either by Orville or connected with him more or less remotely, which in their turn became the sires of a number of excellent hunters. Of a similar character is the example given by "Cecil," in his interesting and useful little work "The Stud Farm," of the mare Penelope,* from which are descended, among many other first-rate horses, Whalebone, Whisker, Sir Hercules, Bay Middleton, and Touchstone. Again, as a son of Sir Hercules, there is Irish Birdcatcher, himself not eminent as a race-horse, but wonderfully so as the sire of winners. The value of knowing such things is great indeed, to one who has to select a stallion for hunters. Without a knowledge of his pedigree and performances, there are scores of horses shown at agricultural meetings, that the judges would prefer to the Hero, supposing (which is very unlikely) he were to be a competitor for such a purpose; yet he would get better hunters than half the showy brutes which are so apt to dazzle the eyes of farmers. Some years since, I put several mares to Tomboy—a little horse of mean presence enough, but with such a back and loins, and such wonderfully propelling hind-quarters! I was rewarded in the stock, for the correctness of my anticipation that the Beeswing blood would vindicate its character for stoutness. My limits forbid me to enlarge on the interesting subject of pedigree, and one on which I would the more insist because it is undervalued by the majority of the breeders of hunters, and indeed of all horses except those designed for the turf. "What does it signify," I once heard a man reputed to be knowing in horseflesh ask, "whether you put a hunting mare to Priam or to Zinganee?" Why, only this—that in the first case, the produce might have had a chance of winning the Liverpool Steeple-chase, while in the second it would have been a wonder had it turned out even an average horse. Racing men, on the other hand, from their familiarity with the wonderful effects of blood, are apt to neglect other considerations equally important—such as the adaptation of the form of the stallion to that of the mare. To the judge of stallions, a competent

* See "The Stud Farm," p. 53.

knowledge of the leading families among the aristocracy of the equine race is no less essential than is experience in the forms which denote qualities most prized in the class of stock of which they are destined to be the sires.

No man is fit to be a judge of the hunting classes of horses, who has not ridden much across a country himself. From want of this rule being attended to, what mistaken awards do we not see given! A showy-looking animal, with a heavy shoulder and sleepy eye, is decorated with the white rosette; while his higher-bred rival, all muscle and courage, stands unnoticed by his side. I know which I would soonest be upon, after a sharp thirty minutes, and with an ugly brook or drain before me! Such is the reflection which *instinctively* occurs to the hunting man. No mere knowledge of forms, however accurate or profound—nothing but long practice and experience, often dearly bought in more senses than one—is sufficient to enable you to judge whether the colt before you has in him the making of a hunter or not.

Lastly, the judge of the young stock ought to be, or to have been, a breeder of the same description of horse himself. A man may be an excellent judge of a made horse, and yet be quite at sea when looking at a young one. Almost every man who breeds horses must frequently be amused at the ludicrously erroneous opinions which even knowing visitors pass upon his young stock. That such should be the case is scarcely to be wondered at, when we reflect how different are the proportions of a well-shaped foal two years old, three years old, from each other, and from a formed horse of five or six years of age. The foal which to the inexperienced eye is of inestimable value frequently makes a worthless horse. The ragged-looking, leggy two or three-year-old grows into a weight-carrying hunter, the pride of the stud.

In conclusion, then, I maintain that the only method by which that full confidence is to be infused into the minds of exhibitors of horses which I believe is felt by those of other classes of stock, is the selection of judges who have had ample experience in the noble animals brought before them. Who would submit his shorthorns to the award of an ordinary grazier, who perhaps had never heard of the "Herd Book"? And yet the case is stronger even than that; for, as far as my experience goes, the average run of farmers, jobbers, and butchers are decidedly better judges of the higher kinds of stock, than are the majority of persons having some pretensions to knowledge of horses. It is somewhat strange that every one deems himself to possess that skill in horseflesh, of which the reality is incomparably rarer and more difficult to attain than a sound judgment in any other kind of stock. One reason is perhaps that few persons have the opportunity of acquiring a knowledge of horses by a sufficiently large induction, and consequently never attain even to a sense of their own deficiencies. With regard to working horses, the awards are generally satisfactory (although anomalous decisions may be noticed occasionally even there), because the judges have had practical experience in that department. And it would not be more absurd to commission the jockey who has just won the Leger or the Oaks, to buy a team of wagon horses, than it is to appoint a man whose chief experience of horses has been with those which work in his teams, to be a judge of the blood and the symmetry of racers and of hunters. Secure, as your judges for the first-class of horses, men who have had large experience in buying and breeding them—masters of hounds if possible—at any rate, men who know how to face the difficulties of a stiff country, men of tried and proverbial skill in horse-flesh; give them a well considered scale of points on which to frame their awards: thus will you establish that feeling of confidence among exhibitors, which will go further than any mere money prizes towards bringing into our show-yards animals worthy to be seen there.

I remain, your obedient servant,

WILLOUGHBY WOOD.

ON THE COMPARATIVE MERITS OF SALVING AND DIPPING SHEEP.

SIR,—I have taken the liberty of sending you the inclosed paper, in the hope that you may give it a corner of your valuable publication. As the season for salving sheep is now at hand, it cannot fail to be read with some interest to your agricultural readers.

I am, Sir, yours &c., ROBT. BOYD, author of the Prize Essay for salving of sheep.

Inverleithen, Oct. 6.

"The salving of sheep is an operation which has been annually performed upon our mountain flocks from time immemorial, and has for its object not only the protection of the animal, but also of the fleece; and that of "dipping" has alone for its object the killing of insects. The operation is generally performed in the beginning of October, while others defer until the month of February or March, in the hope, from the more recent dipping, that their lambing ewes, as well as their lambs, will be less annoyed with kaids and other insects during the spring months.

"The salve we would with most confidence recommend is the 'artificial yolk salve;' and when we consider the chemical nature of the composition, it is the most appropriate name which can be given to it as a new salve; for it is of the same nature, and possesses the same properties, as the natural yolk existing in the wool. This composition has already been used to a considerable extent in the border counties, and has been found admirably adapted for repelling external moisture, preventing cutaneous diseases, and killing instantly all insects with which sheep are infested. It is now a well-ascertained fact, that all fatty matters, whether animal or vegetable, when used in the salving of sheep, ought to be saponified, as it has the effect of very materially lessening the conducting power of heat, in

consequence of the porous nature of the composition, and thereby preventing the heat of the animal's body from making its escape, and consequently adds greatly to the comfort of our mountain flocks during a storm or a protracted winter. From the nature and properties of the composition, it has not only the effect of preventing the 'gilting' or discoloration of the fleece, but improves its felting properties in a very eminent degree, at same time communicating to the wool an indescribable kindliness to the touch, which the 'dipped' fleece, or that produced in the absence of an oily or saponaceous substance, cannot possibly possess. As the cause may not be generally known which produces the gilting or discoloration of the fleece, it may not be considered out of place to mention the fact, that oily and fatty matters are composed of proximate principles, which, upon being exposed for a certain time, and to a particular temperature, gradually assume a different condition, and instead of being found mild and harmless, they acquire an acid nature from the absorption of oxygen from the air. The names of the proximate principles of such matters are, stearine, olein, and margarine, and by this absorption of oxygen from the air, corresponding acids are formed which produce the colour technically called gilting, which is so much dreaded by the manufacturers of white goods. The sole object the manufacturers have, in mixing the oil with a slight quantity of tar, previous to its being administered to the wool, is to prevent the decomposition, which is effected by the action of the creosote and other anti putrefactive substances which it contains: this is so far proved from the fact that even tar loses the property of preventing the discoloration of the wool after a certain time, which can alone be imputed to the evaporation of those volatile substances contained in the tar which are known to be the most certain preventives of either animal or vegetable organized matter. It has long been a well-ascertained fact that a regular warmth is absolutely necessary for the production of a good animal and a fine fleece, and in many cases can only be obtained by administering to our mountain flocks a composition which will not only be found impervious to aqueous matter, but in no small degree a non-conductor of heat, which will protect them from the chilling effects of an atmosphere which holds suspended a large quantity of watery vapour, which is always extremely chilling to an animal body. This accounts for the well-known fact, that a moist air, being a better conductor of heat than a dry one, robs an animal more quickly of heat. Thus, in passing from the dry air of the hills into the vapours of the valleys in a winter morning, we feel as if the transition had been from a temperate to an icy region; hence one of the reasons why sheep thrive best in a rather elevated situation. It is a remark of our old and ever-to-be-remembered friend, the Ettrick Shepherd, that a 'weel-smeared sheep,' although it had a wet bed, yet notwithstanding it occupies a 'dry lair.' Every shepherd of experience and observation must be fully aware of the many advantages that a salved sheep possesses over its unfortunate neighbour which had been merely submitted to the dipping process. The ample protection given to the salved sheep enables them to bid defiance to the pitiless storm, and to dig for the withered herb through heaps of snow; while those that are dipped, poor neglected creatures! are in all probability saturated to the back bone with melted snow, and all but chilled to death. And in this situation they seldom show an inclination to face the stormy blast in search of food, but seem fain to find shelter where they best can; and having once acquired a place of security, there insensibly they remain (if not removed by the shepherd) till death or open weather shall pronounce their doom. The salved flocks, too, are less apt to be injured by their unclean neighbours than those that have been dipped.

"It has long been a well-ascertained fact, that those who labour in woollen factories get their clothes gradually saturated with oil, and their bodies in consequence are regularly anointed with the same substance, which has the effect of exempting them from many diseases to which their neighbours, who follow other professions, are liable. These results have recently had the concurring testimony of the highest scientific authorities of our country; and we are decidedly of opinion that those of our woolly people who crop the lofty summits of our mountains, who have been judiciously salved with an oily and saponaceous substance, will be less apt to be visited with those diseases to which sheep are heir to, than those that were 'dipped,' which are liable to be drenched with every shower that falls, and chilled by every wind that blows. We may with much truth conclude that the salved sheep will be in better condition than those that were dipped; and if so, their clip of wool will not only be greater, but very superior in quality, and better adapted for every purpose of manufacture to which the material can possibly be applied. It is the opinion of some who have written extensively on the nature and properties of wool, that the felting properties depend entirely on the construction. From repeated experiments, we have found that, however perfect the construction of wool may be, if produced in the absence of an oily or saponaceous substance, it cannot possess in an eminent degree the felting or milling properties of a clothing material; and we may here repeat the expressive language of the clothier, 'that cloth is either made or marred at the mill;' and we feel assured that we have the concurring testimony of every woollen manufacturer of Scotland, who has tested the comparative merits of wool produced from salved and dipped sheep, in the manufacture of milled tweeds, that from a given quantity of the former, a greater number of yards (it being understood they are reduced to the same degree of cleanness) can be produced than from the latter, which will not only be superior in quality and make but of greater durability. It is, therefore, the imperative duty of both landed proprietors and sheep farmers of Scotland to adopt those measures which are best calculated to produce a fleece most suitable for being fabricated into that description of goods to which so large a proportion of Scotch wool is now appropriated.

"Although it is not customary to salve sheep which are to be fed off on turnips, we are, nevertheless, of opinion that they would be much benefited in consequence. It must be consistent with the knowledge of every shepherd of experience and observation, that notwithstanding that the sheep, during the feeding season, are not only amply supplied with turnips, but with other food of a miscellaneous and nutritious nature, still, if they have not been salved, but merely dipped, a gradual diminution invariably takes place of the yolk during the winter and cold months of spring; so that about the beginning of March the fleece has become dry and sapless, and less sound in staple than the fleece of the salved sheep, and consequently much deteriorated, not only in weight, but in many of its most valuable properties. How frequently, too, do we find upon the back of the dipped or unsalved turnip-fed sheep a hard crust, which not unfrequently genders into what the skinners technically call 'reif;' which deteriorates the pelt to a considerable extent, as it never fails to leave an indelible mark on the sur-

face of the finished leather, which no process hitherto known can obliterate.

"Cold, like hunger, contracts the pores of the skin, and renders the yolk, that nourisher of wool, less copious, or ill adapted to its natural purposes. When sheep, too, are allowed to fall off in condition during the winter months, and nature demands more nourishment than can be procured, the secretion which produces the wool seems to be destroyed or applied to other purposes of nature, and the fleece which has been deprived of it appears incapable of re-imbuing in the spring the renewed juices, but remain upon the pelt through the succeeding months merely as a dead substance; and when the natural juices are again secreted, they form a new fleece, which gradually displaces the old. Many of the farmers who dipped their flocks last year found, upon weighing their clips of wool, that they required, in many instances, from two to three fleeces to the weigh of two stones more than when their sheep were salved. And the Messrs. Renwick, who, as store farmers, rank second to none, dipped their Buckholm and Williamslaw sheep, while they salved those on the farm of Hawkburn; and although the Williamslaw stock was amply fed with turnips during the spring, the preponderance was, notwithstanding, as regards the weight of wool, greatly in favour of the Hawkburn flocks. Some farmers who have had the misfortune to repeat the dipping continuously for some years, find, to their sad regret, that the wool of their flocks is not only getting thin, but imbedded with opaque or kemp hairs. When sheep get so deteriorated as to produce kemp hairs, it is not one, nor even two years, under the most careful management, that will restore them to their wonted health. Everything having a tendency to affect the health may always be considered as calculated to diminish the natural secretion, and consequently deteriorate the quality of the wool.

"Fineness is in a great measure connected with the yolk, the secretion of which ought, on that account, to be promoted, by attention to the general management of the animal, as it is well known to undergo a change of properties by starvation, exposure, or any neglect whatever. The strongest constitution cannot, with impunity, be tampered with, and the soundest habit will fall before the mining attacks of want and weather.

"The yolk salve, to which we have referred, is composed as follows:—

"30lb. of butter; 14lb. rough turpentine; 3lb. black soap; 2lb. soda ash; 5 bottles refined spirit of tar. To this 21 pints of water are added, to assist in the equal spreading of the mixture. Stale urine, in place of water, is an improvement. The above composition is found sufficient to salve 100 sheep; and when salving butter can be purchased—5d. or 6d. the price generally paid for it—the whole composition will cost at a rate of 2¼d. a-head. The mixture requires to be constantly stirred during the time it is administered to the fleece, and at a temperature a little above blood heat."

OUR CONSUMPTION AND SUPPLY OF BREADSTUFFS.

If ever there existed doubts as to the importance of agricultural statistics in the minds of any, the present season is one which ought to remove them; for had we been in the possession of the necessary statistics, our consumption, home supply, and dependance upon foreign resources for breadstuffs would have been known. We should then have ascertained how much our millions annually consume; how much of this consumption is grown by British agriculture, and how much by foreign agriculture. By this time we should have known the number of quarters of wheat, barley, and oats, which crop 1853 would yield, sufficiently near the truth to have enabled us to make up our shortcomings in foreign markets. But in the absence of such, we know comparatively little, save speculating in a manner altogether unbecoming our boasted scientific attainments; for daily may be heard in circulation the grossest contradictions and absurdities imaginable in connection with the commerce of the greatest necessaries of life, rendering it impossible for farmers to form any satisfactory idea as to the facts of the case at a time when they are tying up feeding-stock and sowing wheat.

Some twelve months after we have sold our bread-corn and butcher-meat, the Board of Trade informs us how much wheat and flour have been imported, and how many cattle! but leaves us in the dark as to the actual consumption! In 1855 we shall know the deficiency of crop 1853, but nothing of the crop itself! Wise behindhand, we can now look back on the few years of cheapness, and safely conclude that more corn ought to have been converted into butcher-meat and dairy produce than has been; but who could have told that, when buying in feeding or rearing stock in autumn? Who, at Michaelmas, could tell what would be the price of corn at Ladyday and Midsummer, so as to regulate his purchases of stock, sales of corn, or sowing for next year's crop? and at present who can tell what will be the prices six months hence, in either Mark-lane or Smithfield? The supply and consumption of the daily necessaries of life of the British people are subjects which belong, as yet, to the unseen world, as it were; so that it may not unaptly be said we are rather venturing upon dangerous ground. Be it so. But although we cannot presume to advance facts, we may yet surely approximate to within a reasonable distance of them—even in the absence of statistics, refute the exaggerated accounts in circulation; and this is just what we do propose in our present lucubration.

The value of a thrifty wife is well known in domestic economy. All ages bear witness to the fact that she will nurse and bring up well a large family on the one-half of what the small family of the thriftless woman will live upon. We have known, for instance, two farm servants, married men, with wives and families, whose wages were equal, but whose families were unequal, the one having six children and the other only four, the one with the largest family saving money, and the other in poverty and rags. Neither of the husbands

frequented the alehouse, or spent their money in beer or tobacco. In this respect they stood upon a footing of equality; and before marriage the poor man was the richest, for the other then did frequent the alehouse. Both received their wages in kind. In short, the difference after marriage was all the doings of women. Each had her cow, her pig, and poultry; and when the farmer's cart called at the one's door with flour, potatoes, coals, &c., it also called at the other's. But the thriftless woman could not make the two ends of the year to meet, because her children consumed so much; while the other not only made the two ends meet, but something more, placing annually an addition to the family account in the savings' bank. Her children, unlike her neighbours', were always fat and well clad; her needle "making old clothes look almost as good as new." Her hens were always laying, her pig fat, her cow sleek, and "hearth" clean, surrounded with smiling faces, on her husband's return home at night. The difference between the two domestic circles is indescribable; and all, we repeat, because of the doings of woman. Just so is it with nations as with private families, domestic economy being of as great importance in the one case as the other; for nations in possession of this virtue will prosper, while those which have it not will starve at one time and riot at another, let the supply be almost what it may.

England has been accused of being a little lavish in her domestic economy by her neighbours; this is probably because she is wealthier, having more to spend than they. But, without attempting to mitigate any of our shortcomings in this respect, few will deny the fact that she is better able to make the two ends of a deficient harvest meet than any other kingdom in the world, and that she is probably better able to meet the emergency of the present season than any of its predecessors. Her wants are ever civilising the most savage tribes of the world, making them forego their barbarous habits, become industrious, and ransack their unexplored dominions to supply us with articles of which we previously knew comparatively nothing, such as the Brazilian "*ground-nut*" from Western Africa, of which the imports are increasing "at the rate of 20 per cent. per annum." Her wants, in short, have already added a very large increase to the number of our edibles.

While we have been progressing in the fattening of cattle, it cannot then be said that we have altogether been standing still in the more important theory of feeding our millions. Although it is much to be regretted that less progress has been made in the latter than in the former, still it is some consolation to know that we are progressing slowly; and our imports prove this beyond controversy, for they show, among other things, that England, for all the lukewarmness she once threw upon the zeal of a late political economist to improve the condition of her working classes, is now annually consuming a very large increase of Indian corn—not of necessity, but of choice; and that there is every prospect of this increase being greater, as prejudice gives way to common sense in the domestic circle of those who really constitute our bread-consuming population. This has been experienced in America; for there, although farmers are becoming more wealthy, they are consuming more Indian corn—partly arising from improved methods of manufacturing and cooking it, and partly from the annual influx of emigrants from England being less subject to prejudice than formerly. There is also more oatmeal used in England than formerly; and more wheaten flour in Scotland and Ireland—changes which prove that the prejudices of olden times are everywhere disappearing before the light of science.

An increased consumption of Indian corn, rice, and other farinaceous imports of this kind not grown in Britain must always exercise an important influence upon our consumption of foreign wheat, even under ordinary circumstances; while high-priced wheat in our oatmeal-consuming districts, with an extra quantity of oats in the stack-yard, must increase the consumption of the latter, and greatly diminish that of the former in years like the present, thus farther reducing our demand for foreign wheat. This latter circumstance is perhaps of more importance than some may imagine at first sight; but when the fact is considered, that little short of half the population of the kingdom consume more or less oatmeal daily, it will readily be perceived that if oatmeal fetches 30s. per 280lbs., and wheaten flour 70s. per 280lbs. this year, instead of 28s. and 40s. respectively as during last year, then the difference must be considerable. And besides, oatmeal and Indian corn, peas and beans, are ground along with barley and oats, or the dressings of wheat, for bread. When we first saw this mixture sent to the mill we had some difficulty in keeping prejudice at her proper distance; but it was preferred by the labourers to any other, and we soon found that they were fitter for their work upon it than on wheaten bread alone. It is sometimes leavened and baked in loaves, but more frequently in unleavened cakes. In either case it makes wholesome bread, but especially when leavened. Servants unaccustomed to it are apt at first to eat too much, and then complain of its not agreeing with them; but the more intelligent and discriminating soon get over mistakes of this kind. To supply the muscular waste of the body consequent on exercise, pea or bean meal is two and a-half times more nourishing than wheaten flour. In other words, for every twelve bushels of peas and beans thus consumed, there is a saving of thirty bushels of foreign wheat. Again, the Americans are converting their Indian corn into cheese. Now, 12lbs. of cheese are equal to 60lbs. of flour, or rather more than a bushel of wheat; so that if the former can be had for 7s., and the latter costs 10s.—and even 15s. when bought in quarterns (or quarter-stones, 3½lbs.), being then double the value of cheese—it consequently follows that more American cheese ought to be, and doubtless will be, consumed, and less American wheat.

All these things affect our dependance upon a foreign supply of wheat.

That an increase of Indian corn and the other articles just noticed will this year be consumed, and that a consequent decrease will take place in the consumption of wheat, is a proposition the soundness of which requires no proof. The effect of 1847 places that beyond a doubt; but the actual increase of the one, and the decrease of the other, is a problem not so easily solved, although the principal one at issue.

It has been estimated that we consume about six bushels of wheat per head per annum. Taking the population of the kingdom, in round numbers, at 30,000,000, this would give a total consumption of 22,500,000 quarters, of which 5,000,000 quarters are foreign and 17,500,000 quarters English. If we suppose that five-eighths of this are consumed by that half of our population which eats wheaten bread only, and three-eighths by the other half, and that the latter only this year eats two loaves for three it used to do, then the decrease in the consumption of foreign wheat would be one-eighth of the whole, or 2,800,000 quarters; so that when we add the increased consumption of Indian corn, cheese, &c., &c., to the other side of the account, we may safely conclude, making every allowance for exceptions, that there will be a general decrease of about 3,000,000 quarters of wheat at our present prices. Our present crop, however, is deficient one-fourth, according to the general reports of the country—say, in round numbers, 5,000,000—consequently we require this year an increased import of 2,000,000 quarters of wheat, making a total import of 7,000,000 quarters, supposing the general import 5,000,000 quarters.

This conclusion of 7,000,000 quarters of foreign wheat, including flour, is, we apprehend, rather above than below the demand this year; for this being the safest side to err upon in any approximation, it will be seen that we have given the above figures accordingly.

In America, although much more food generally is consumed by the people (all having an abundance and to spare) than in England (where there is in every province a vast amount of pinching privation); yet the consumption of wheat per head rather falls under six bushels than above it (according to official reports), the increase being in Indian corn, butcher meat, and dairy produce. Blacks, in the slave States, eat about thirteen bushels of Indian corn each; and whites, probably about half the quantity, or nearly equal quantities of Indian corn and wheat. In 1850, the crop of Indian corn for the Union was estimated at 66,000,000 qrs.; wheat, say in round numbers, 20,000,000 qrs.; population about 23,000,000; and exports of wheat and Indian corn 2,000,000 qrs. each; consequently the consumption of Indian corn for human food, and exports, may be stated at 26,000,000 qrs., leaving a balance of 40,000,000 qrs. to be consumed by cattle (?) Yes, American cattle consume more bread-corn than the English people!

In America, the estimated produce per acre is small when compared with England, for the above 20,000,000 qrs. would not be the produce of less than about 25,000,000 acres of land; while the 17,500,000 qrs. English will be grown on not more than 6,000,000 acres. Neither the statistics of the one country nor the other, it must here be remarked, are yet much to be relied upon. We believe the produce and consumption of wheat are greater in America than generally credited; and the lands annually under wheat over than below the above quantity. In corroboration of this we may mention that the whole lands reclaimed in the Union exceed 100,000,000 acres. That in Michigan, where statistics are the most accurately taken, there were in 1848, of improved lands 1,437,459 acres. Of this, 465,900 acres in wheat, yielding of produce 4,789,299 bushels—population 412,000; so that we have upwards of one-fourth of the land in wheat, upwards of ten bushels per acre, and upwards of ten bushels per head of the population.

So much for *consumption*. A few words will suffice for *supply*. From whence are we to get 7,000,000 qrs. of foreign wheat to support our population this year?

The United States have this year an extra crop of about two bushels per acre (no very great increase, after all), or 6,250,000 qrs. on the 25,000,000 acres, which, added to her ordinary export of 2,000,000, will make a total of 8,000,000 quarters. England can have the whole if she gives the dollars. Canada can give 1,000,000 qrs. Grand total from America, 9,000,000 qrs. of wheat, with twice the quantity of Indian corn—before we starve (?). Again, no one doubts but 7,000,000 qrs. can be had from the Black Sea alone, were it not for the warlike attitude of Russia and Turkey. Now, instead of war diminishing the supply, it will compel both those powers to increase it, in order to cover the extra expense; and if there are any who think that the combined fleets of England and France, or England alone, cannot and will not secure freedom to the trade of the Black Sea, they are to be pitied.

An objection may perhaps be brought against the above supply from the United States. It has, for instance, been said that, according to the last census, the increase of population generally has taken place in towns, and that this increase has consumed, and will continue to consume, the whole produce.

The fallacy of this objection lies in the fact that its authors overlook or conceal the progress of chemical and mechanical science in the Union, with the consequent subdivision and abridgment of labour by machinery in the cultivation of the soil, and manufacture of its produce for market. A single mechanic, for instance, in town, is enabling ten farmers to do three times the work, equivalent thus to thirty farm servants in the provinces. Land, in short, was never so high in price as it is at present, nor being reclaimed so fast, or agriculture in such high repute among our transatlantic cousins. Californian gold and machinery are beginning

to speak for themselves. The Union is already pretty well intersected with railroads; and all that she wants is the plough throughout her boundless prairies, to give a more practical refutation to this objection.

From these observations, we need hardly, in conclusion, say to millers and bakers of capital, "Take care of your money;" or to farmers who have old corn on hand, "Don't let the rats and mice eat it." The rupture between Russia and Turkey may afford speculators an opportunity of exercising their functions successfully for a little; but it will not diminish our supply from the Black Sea to the extent expected: and as for America, a little increase per acre will be found something, when collected together from her vast territorial resources.

MICHAELMAS RENTS ON CORN AVERAGES.

SIR,—From the many inquiries made last year with reference to the average price of wheat, or of wheat, barley, and oats for the *year ending on Michaelmas-day*, I have no doubt the rent of many farms has been fixed subject to that average. I therefore beg to send you the following statement, which in such cases will be found useful; and perhaps, at the present time, not uninteresting to the general reader:—

AVERAGE PRICE PER IMPERIAL QUARTER IN ENGLAND AND WALES:

FOR QUARTER ENDING	WHEAT. s.	d.	BARLEY. s.	d.	OATS. s.	d.
Christmas, 1852 ..	40	5	29	3	18	2
Lady-day, 1853 ..	45	7	31	0	18	6
Midsummer, „ ..	44	6	30	9*	19	0*
Michaelmas, „ ..	51	10	30	7	21	6
FOR THE YEAR ENDING						
Michaelmas, 1853 ..	45	7	30	4	19	3

I remain, sir, your obedient servant,

CHARLES M. WILLICH.

No. 25, Suffolk-street, Pall-mall,
3rd October, 1853.

P.S. I annex the weekly averages for the whole of the year up to Michaelmas, 1853, in case you consider that this return will be of some assistance in forming an opinion as to the future, in the present critical state of the corn market. It is on this *data* that the above averages are based.

WEEKLY AVERAGE PRICE PER IMPERIAL QUARTER:

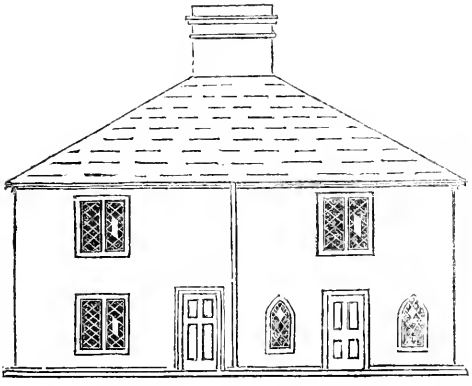
Per *London Gazette*,	WHEAT. s.	d.	BARLEY. s.	d.	OATS. s.	d.
Oct. 8, 1852..	38	9.729	27	4.473	17	4.226
„ 15, „ ..	38	5.680	27	5.724	17	6.855
„ 22, „ ..	37	10.672	27	8.534	18	0.450
„ 29, „ ..	38	8.766	28	8.744	17	10.089
Nov. 5, 1852..	39	2.381	29	5.333	17	6.412
„ 12, „ ..	39	5.647	29	9.651	18	3.245
„ 19, „ ..	39	11.839	30	2.775	18	7.402
„ 26, „ ..	40	0.942	30	6.142	18	9.166
Dec. 3, „ ..	40	5.572	30	7.466	18	6.725
„ 10, „ ..	41	2.024	30	0.318	18	5.527
„ 17, „ ..	42	1.322	29	9.441	18	7.062
„ 24, „ ..	43	10.176	29	9.461	18	5.342
„ 31, „ ..	45	11.836	29	9.351	18	6.340
Jan. 7, 1853..	46	7.531	29	8.140	18	9.496
„ 14, „ ..	46	0.402	29	8.109	18	6.117
„ 21, „ ..	45	10.341	29	10.336	18	7.269
„ 28, „ ..	45	8.031	30	5.161	18	7.269
Feb. 4, „ ..	46	0.427	31	2.032	18	7.049
„ 11, „ ..	46	1.644	31	8.410	18	7.376
„ 18, „ ..	45	2.404	31	5.087	18	5.936
„ 25, „ ..	44	6.199	31	1.134	17	9.108
Mar. 4, „ ..	45	2.282	31	3.421	18	4.762
„ 11, „ ..	45	9.562	31	7.571	18	3.686
„ 18, „ ..	45	8.792	31	9.319	18	6.220
„ 25, „ ..	45	5.320	31	9.422	18	10.210
April 1, „ ..	45	9.259	31	10.465	18	9.928
April 8, „ ..	44	4.271	31	6.413	19	0.237
„ 15, „ ..	44	9.473	31	4.848	18	9.700
„ 22, „ ..	44	10.536	31	11.245	19	0.728
„ 29, „ ..	44	7.236	31	5.189	19	0.744
May 6, „ ..	44	4.785	31	6.745	18	8.235
„ 13, „ ..	44	6.194	31	4.609	19	0.782
„ 20, „ ..	44	7.207	31	5.321	18	8.975
„ 27, „ ..	43	11.706	30	11.001	19	1.162
June 3, „ ..	43	9.708	30	6.957	18	7.754
„ 10, „ ..	43	3.742	29	6.166	19	0.665
„ 17, „ ..	43	11.458	29	10.213	18	10.348
„ 24, „ ..	45	0.738	29	1.931	18	11.794
July 1, „ ..	46	11.041	29	3.675	20	1.258
July 8, „ ..	47	3.206	29	10.841	20	6.055
„ 15, „ ..	47	8.651	29	2.803	20	6.991
„ 22, „ ..	49	8.271	28	11.854	20	11.061
„ 29, „ ..	51	10.834	29	4.201	21	6.399
Aug. 5, „ ..	52	7.373	29	7.728	22	2.651
„ 12, „ ..	53	9.890	29	9.225	22	6.948
„ 19, „ ..	53	3.878	30	0.368	22	3.525
„ 26, „ ..	51	1.682	29	7.862	22	0.310
Sept. 2, „ ..	48	6.791	29	6.384	21	6.371
„ 9, „ ..	50	4.177	30	4.750	21	10.248
„ 16, „ ..	54	9.392	31	3.228	21	11.024
„ 23, „ ..	56	7.433	34	9.813	20	6.524
„ 30, „ ..	56	7.459	35	9.253	21	4.086

* These averages for the quarter will be one penny less if the decimal parts of a penny be omitted in the weekly averages.

THE COTTAGES OF MR. HEATON CLARKE, OF ELLINGTHORPE.

Having had several inquiries from different quarters respecting the cottages of Mr. Heaton Clarke, of Ellingthorpe, we have for some weeks past proposed giving a description of them, but have not been enabled to do so, with the drawing taken on the spot, by Richard Pick, Esq., of Sowerby, before to-day, which we have great pleasure in presenting to our readers. We may premise that there is none of that fantastic and costly decoration about them which is so often recommended to landlords intent to improve their estates, and which frequently prevent many a poor family from living in a comfortable cottage. These cottages are dry, airy, and comfortable; not too large, nor too small; well lighted, drained, and of sufficient capacity for *comfort* as well as for use, nor are they very costly. The first figure is a block of two of them, and, for convenience, the one is reversed, so that one half, in fact, represents the front, and the other the back elevation. They are all built in blocks of two, so as to give ample space, and the three large windows represent those of two sleeping and one living room; the two smaller ones comprise the pantry, and the back kitchen.

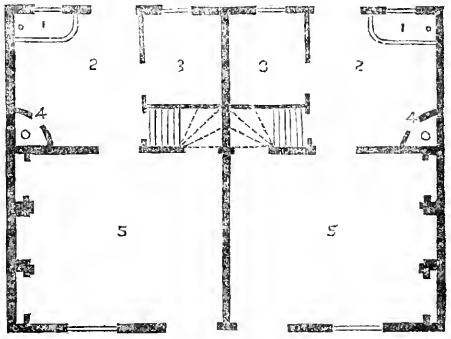
Fig. 1.



Front elevation. Back elevation.

The ground plan of the cottages is exactly as they are placed. The capacious living room, 15 feet 6 inches by 12 feet, is a wide contrast to the miserably small places in which some *families* are crowded, and this alone is a feature to which too much prominence cannot be given. The back kitchen has both a sink and a boiler; the one a source of great cleanliness, and the other of immense use in saving labour, and assisting in feeding the cottager's pigs. A pantry, 6 feet 7 inches by 5 feet 6 inches, is a useful appendage, and so unlike the smothering closets of too many cottagers' residences, as to shew that the architect has understood the real wants of the occupier. Why, for instance, should not he be able to keep cleanly and airy, and free from decay and corruption, his small joint of meat as well as his wealthier neighbour?

Fig. 2.

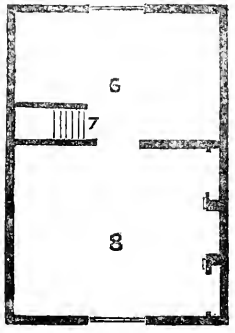


Ground plan of two cottages.

1. Sink, 2 feet by 5 feet.
2. Back kitchen, 10 feet by 10 feet.
3. Pantry, 6 feet 7 inches by 5 feet 6 inches.
4. Boiler.
5. Front kitchen, or living room, 15 feet 6 inches by 12 feet.

We will now give the chamber plan of each cottage, which has two comfortable rooms, as large as could be wished, and with the smallest possible sacrifice of space.

Fig. 3.



6. Bed room, 15 feet 6 inches by 10 feet 6 inches.
7. Stairs.
8. Front bed room, 15 feet 6 inches by 12 feet.

Chamber plan of one cottage.

We believe very useful hints to many a proprietor may be taken from these plans. They shew, at any rate, the principles of construction most fully, and, though improvements may be made in them, they are as comfortable, as adequate to the wants of the inmates, and as ornamental as any reasonable man could desire.

WAGES.

OTHER FORMS OF THE EQUITABLE WAGE PRINCIPLE.

No. XIII.

To recur again to one form of the equitable wage principle, as we find it pleasingly exhibited in the Vauxhall candle factory. The accounts I have given of the Messrs. Wilson's noble efforts have hitherto had reference only to the children and young people of their establishment. They have been as attentive to the requirements of the adults of the Belmont and other Works as they have to the children's—practically recognising in this, as well as in the other case, the duty of every capitalist to adopt the system of reciprocal interest.

Subsequent to the measures confirmed in the manner I stated in my last letter by the entire body of the proprietors, the managing directors, the Messrs. Wilson, in November, 1852, published a letter to the board of directors of Price's Patent Candle Company, containing further propositions for the good of the workpeople.

They begin by alluding to the enormous increase in the demand for the candles within the year, and to the promise of a great dividend. They show that the hearty good-will with which the factory has worked —"men and boys making the extra exertion which they saw to be necessary to prevent our getting hopelessly in arrear with orders, as heartily as if the question had been how to avert some difficulty threatening themselves personally"—results from the good feeling evinced by the company at its last annual meeting towards the factory. They show that the money cost at which that feeling was exhibited is already repaid, and that a guarantee is thus given as to the profitable return that will attend any further steps taken by the company in the wise course of kindness upon which it has entered. They call upon the company to appreciate the feeling and conduct of the factory, and to evince "a desire to perpetuate and strengthen the present happy cordiality of feeling between it and its people," and to make the increasing prosperity of the concern the source of increased comforts to them, by conceding to various proposals.

The first proposition is, "That after the balancing of the books, should the year prove very successful, there should be a return of two weeks' extra pay to each of the clerks and foremen, and one week's extra pay to every other person receiving weekly wages who shall have been in the company's employment equal to a full year, and have conducted himself unexceptionally during the time, and half-a-week's extra pay to those who shall have been four months."

What, my readers, must be the effect of such a measure as this? it cannot fail to work well. The small share in the general prosperity to which he has contributed is most acceptable to the workman; but the manly recognition of his *right* is a thousandfold more so. It gives him an erect bearing, a strong arm, a steady hand, a cheerful disposition, and a warm heart. It is worth more to him than gold and silver. And a feeling thus engendered in the labourer, what is it not worth to the capitalist?

The second proposal is, "That the Saturday half-holiday of the summer should be made a regular half-holiday, instead of being, as at present, a mere arrangement of the men themselves, sanctioned by us, to work more on five days of the week and less on the sixth." In the case of those who are piece-workers all the year round, or of those who cannot stop at half-past twelve on Saturday afternoon (for there are parts of the work which never can stop, without loss to the company, between twelve o'clock on Sunday night and twelve o'clock on Saturday night), it is proposed to pay a fortnight's wages, and to give the opportunity of a fortnight's trip to the sea-side or to country friends.

The reason that anything is mentioned of this particular form of granting the summer indulgence in particular cases is, as these gentlemen say, "Because we have already tried it in a small way, and with such results as have made us wish to attempt something more general. We have sometimes seen a valuable man flagging at his work, being evidently in a state in which it was too much for him; and we have, as a matter of pecuniary interest to the company, sent him off for a holiday for a week or two without stopping his wages, and the experiment considered as an economical speculation by the company has completely succeeded." They mention five boys who were sent to rusticate last summer. Two after returning to work, not being thoroughly restored, daily lost strength. My readers must allow me to quote, respecting these lads, the words of the Messrs. Wilson; for they discover a noble spirit, such an one as we should all do well to seek and cultivate. "They would probably, like too many a boy before

them, on returning to work, pulled down by fever, have continued to get weaker and weaker at it, until compelled to leave it altogether; and here would cease, according to the established trade principle of a fair day's work for a fair day's pay, all connexion between their master and them, and he need not, in walking through his factory, let any uncomfortable thoughts be raised in his mind by two new and healthy faces appearing where two sickly faces had been before; and if he wished to avoid such thoughts he had better ask no questions, for the answer would probably be, that, with losing their work the wages which gave them their only chance of recovering their strength, they sank all the faster after leaving it, so that but few weeks at home were needed to prevent their sickly faces troubling any one more. But the Factory Sick Fund gave our two boys £2 each, and the company as much more, and sent them off to Margate." The two or three weeks' change sent these two and the other three back to their work quite different beings—able to bear anything.

I must not forget to state that the money amount of the first proposal, that of extra pay, is about £900, while that for the half-holiday, &c., is about £1,200, *i. e.*, the money difference between 3,110 hours and 3,006 for the whole of those to whom a holiday is proposed to be given, supposing the speed and quality of the work to be alike in the two cases. The Messrs. Wilson, however, place this matter in its true light, thus: "We are going to pay each one of a certain number of our people wages for 3,110 hours in each future year, as we have in each past year; but we are going to make them work in future only 3,006 hours for their pay of 3,110, and we assert that out of these 3,006 hours' work, done in the spirit in which it will be done, we shall have more value than out of 3,110 hours in the ordinary spirit." We see therefore that if this outlay of £1,200 *is true in appearance, it is absolutely false in fact;* and although in an abstract statement these proposals would together show an amount of some thousands of pounds on the debit side of the account, the probable results, could they likewise appear in the statement, would show together a large total on the credit side of the company's books.

"The third proposition," continue the Messrs. Wilson, "consists rather of an alleviation of an evil imposed upon our people by the increase of business than of any positive and unusual benefit to be conferred on them." Under this head it is suggested that washing arrangements should be made, that a good breakfast should be provided, and that extra clothing should be supplied to those engaged in the night works, in order that "after being freshened up by this, they may set to work at reading, schooling, chess-playing, tailoring, shoemaking, or anything else they may have a fancy for, and we may be able to teach them till it is time to go home and get to bed. The two hours so spent in our comfortable school-rooms, and after a good washing and breakfast, will be a great benefit as well a pleasure to the poor boys; and also their going to bed after these two hours will be better for them than taking their meal at the family breakfast, and getting into bed immediately afterwards." I give the sentence in full, because it tells so beautifully the just consideration which weighs in the minds of these gentlemen towards those they employ. The extreme cost for the year of this arrangement will be nearly £500.

The fourth proposal is, that the company should subscribe one penny a-week to the factory sick-fund for every person in its employment. This fund arose in the understanding amongst the work-people, that any one receiving more than ten shillings a-week wages was to subscribe one penny a-week to it, while those who received less were to subscribe a half-penny.

The fifth and sixth proposals are for washing arrangements for the people generally, and cooking accommodation for the men, and a good room to eat their meals in. The seventh is "To rent a grass field near the factory, with trees upon it, and to place a careful person in charge, with a good supply of books, on the summer Sunday afternoon, from two o'clock till five; and to let the boys and men come here, and sit about in the shade reading." The eight proposal is, that the company shall subscribe to the men's Mutual Improvement Society, for which a house is to be taken, containing class-rooms and a reading and lecture-room. The ninth proposal is, that the company shall make arrangements for receiving into its charge, to lie at interest or to be paid out at any time on demand, any part of the wages of the people which they may wish so to put away in small separate sums. I cannot find room for the valuable remarks upon savings' banks that follow this proposition. It may at some future time be well to touch on this subject. The tenth and last proposal is, that a money reward shall be given at the end of the year for regularity as to time —not a fine for irregularity.

The money cost of these six last propositions may be estimated at £1,000.

Many of these plans took their rise in Mr. Budgett's experiments, to whom I have already referred; and the Messrs. Wilson remark upon this: "We are very glad to show this source, because our being able to do so answers at once a doubt which

might arise as to some of them being untried and unbusinesslike. We have, in making them, kept in view not what we should do if the business were our own, *but what we can defend on business principles as a legitimate and wise application of funds entrusted to us for trading purposes;* and with this limit imposed upon ourselves, *we have stopped far short of what Mr. Budgett proved to be not only compatible with trading prudence, but to be actually a profitable part of a system of management which might perhaps defy the world to show its superior in point of economical success.*"

I have introduced, wherever it was possible, the arguments with which these gentlemen enforced their own proposals, because, being thoroughly practical men of business, their words are authoritative. And I have done so, because these arguments were conclusive with the directors before whom the report was read, as the following resolution will prove.

The various propositions of the managing directors having been maturely considered, it was resolved "That the board do cordially and unanimously approve of them, believing that the interests of the proprietors at large will be materially and permanently benefited by their adoption. But considering their importance, it is deemed proper that the sense of the proprietors be taken thereon, and that an extraordinary general meeting be summoned, and that in the meantime the managing directors' letter with this resolution be printed and circulated among the proprietors."

The extraordinary meeting took place on the 16th of December, 1852, and resolved with only two dissentients—

"That the proprietors cordially concur with the board in their approval of the report of the managing directors, and of the propositions contained in it; and view with great satisfaction the happy state of feeling shown by the whole tone of that report to be at present subsisting between the company and its work-people, and rejoice in the prospect of deriving from the company's increasing prosperity the means of increasing their comfort and advancing their welfare."

Thus have I shown, but too briefly to do them justice, some examples of the tribute or equitable wage principle, together with its rational and humanizing effects, in opposition to all the examples, yes, the mildest that could be adduced, under the slaughtering principle of supply and demand. I would have every farmer think within himself whether it may not be well to encourage the better rather than confirm the worse.

No. XIV.

THE FAIR REMUNERATION OF LABOUR; ITS JUSTICE AND BENEFITS.

It may be very possible that many of the readers of my late letters have expressed some impatience at my having entered the lists in behalf of the labourers at a time when they appear to be in the ascendant and making their own terms. In answer to this objection, I say that it is the spirit of insubordination, recklessness, and, I may add, revenge now abroad, that leads me to impress the necessity for the existence of that mutuality of interest so frequently mentioned in these letters, but so seldom witnessed in the relationships of masters and men.

The leading feature of the strikes, now so common amongst both the workmen of town and country, is not a good feature. In a well-regulated state of things there should be no such things heard of as strikes. We cannot wonder, however, that they are prevalent, when we look at the case as it stands and has long stood. The work-people, finding through their lives that they have their own interests to regard, have come to believe that the general maxim, Every one for himself, is that which is universally adopted by masters of all grades; neither are they very far from the mark, as our every-day life proves: for surely we see enough of this bad principle at work *around* us, and feel enough of a bias towards it *within* us.

Any sudden and spasmodic change of conduct will merely produce disappointment. The conviction amongst the poor, that they are regarded as the mere slaves and dependants of the rich, is deeply rooted. It has descended from father to son: it is not to be expected, therefore, that it can be suddenly removed. It was the other day represented to me by a gentleman actuated by the most benevolent intentions, that the reward he had met with from his men, towards whom he had pursued a course of kind consideration, was most discouraging. I asked him how long such matters had engaged his mind. He replied—"About eighteen months I have been devising means to better the condition of my people." "And how long," I asked, "before that time had you been working for your own interest, regardless, or nearly so, of the condition of your people?" "Ten years," was the reply. "And who," continued I, "preceded you, and was the tenant before your predecessor—in a word, what has been the influence under which these people, of whose ingratitude you complain, have been born and bred?" "Why far, very far from good," he said: "one long tale of misery, poverty, ignorance, and degradation, from the cradle to the grave." "Can

you expect then," I added, "to do away with the impression that the unkind and oppressive treatment of a century or more has produced, by a counteractive course of only eighteen months? The poor are very suspicious of our motives; and it is only by a long and consistent perseverance that we can overcome their prejudices, and convince them that we are earnest in our endeavours to promote their good. This becomes admirable discipline for us; and if we can carry out our plans for the improvement of the working classes, under daily discouragements, and more under the very opposition of those we intend to benefit, then we may congratulate ourselves that we act from principle, and are really in earnest to push our principle upon the notice of the world, as one calculated to conduce to its social health and strength. So long as masters regard a fair remuneration only as subsistence money, a fitting return in exchange for labour, so long shall we have want and complaining in our streets, and a combustible element in our lower classes. And as we know that the strength of a nation consists in the toiling, the happiness, and cheerful industry of its lower classes, surely it should be one of our first duties and objects to secure to them the proper concomitants and pleasures of life. Poor there shall be always in our land; but there is no reason why there shall be poor oppressed and starved—poor who shall toil for the rich without the sympathy of the rich—poor wretchedly clothed and miserably housed—poor whose dwellings shall be such as to breed fever, or attract its malice, and whose occupations so often tend to stamp out the man and to develop the brute propensities—poor who shall remind us of old Sandy Macay's anatomical figure, under which he had written:—

> "Here I stand a working man;
> Get more skin off me if you can."

Depend upon it that we masters are answerable for such a state of things. It is no use, my good reader, to say that *Society* is to blame, or *Government* is to blame. What folly it is to believe and to say that society is to blame—that society can do this and that—that society can take care of the individuals of which it is composed! I should say individuals are to blame for what society is and does: for who ever heard of such a paradox as *that* of a *whole* making up *its parts*? We all know that a whole is made up of parts; that a corn stack is made up of ears; that society is made up of individuals. No; the blame rests with *ourselves*; and *you* and *I*, and all other masters, good reader, are mutually and individually responsible for the condition of those placed by Providence beneath our care. While seeking their good from a pure love of high principle—I mean that which asserts us all brothers—we may see also, if our plans are judiciously conceived and executed, that we are advancing our own interest, and by enlarging the sphere of human sympathies, elevating the position of man, and bringing him daily nearer to that time when there shall be no voice of distress and complaining heard in our streets. Argue as we will, we cannot get away from the responsibility. As to the Government in a matter such as this, as I have before stated, it is inefficient—powerless. The Government is only what you make it—does only what you plan. If any man is discontented with the condition of the poor around him, he, and no others, must set to work to remove and amend. This work cannot be done by deputy. I know that this is an unpalatable doctrine to urge in a public print; but what has gone before has led me to think that it is not *really* out of place, only *apparently* so.

I suppose we are all agreed upon this point—that a labourer ought to be self-supported. But a labourer, to be self supported and avoid becoming a burden on the parish, requires something more than bare subsistence-money in remuneration for his labour; and yet this is generally the mode by which we test the *sufficiency of wages*. "A man can live very comfortably upon that!" is the exclamation of those who have seldom thought upon what constitutes the *minimum* of self-support in this country. A man's wages, to prevent pauperism, should include, besides present subsistence, what Dr. Chalmers has called "his secondaries," viz., a sufficiency to pay for his maintenance, 1st, during the slack season; 2nd, when out of employment; 3rd, when ill; 4th, when old. These items wages must include, to prevent pauperism *even with providence*. But this is only on the supposition that the labourer is unmarried; if married and having a family, then his wages should include, moreover, the keep of at least three extra persons, as well as the education of the children. If not, one of two results is self-evident—either the wife must toil, to the neglect of her young ones, and they be allowed to run about and pick their morals and education out of the gutter and by the wayside, or else the whole family must be transferred to the care of the parish.

O! would that a tithe of the attention given to the invention and perfection of implements—the breeding of cattle—the better modes of cultivation and the investment of capital in all other ways, were given to this subject, which lies at the foundation of national peace and prosperity! Let not those who are induced to follow out these suggestions be dis-

couraged because they are alone. The force of example is irresistible.

"How far this little candle throws its beam,
So shines a good deed in a naughty world!"

No. XV.

FURTHER REFLECTIONS.

I cannot, good readers, leave this subject, even for the present (for I shall come back to it again), without a few more words by way of enforcement.

Mr. Caird, in his "English Agriculture in 1850 and 1851," draws what he calls a *wages line* through England. This divides it, as we might expect if we gave the subject a little consideration, into north and south. In the northern counties the labourers are enabled to feed and clothe themselves with respectability and comfort, while in some of the southern counties their wages are insufficient for their healthy subsistence, as I showed in my second or third letter. The accuracy of this line is obvious from the following figures :—

	s.	d.
The average of all northern counties..	11	6
The average of all southern counties..	8	5

Mr. Caird goes on to show that the agricultural labourer in the southern counties, while he derives from his labour the means of a very scanty existence, is almost everywhere felt as a burden instead of a benefit to his employer. And he further shows that the counties which stand *high* in the scale of *poor-rates*, stand *low* in the scale of *wages*. On consulting the table beneath, we shall see this to be strikingly the case.

	s.	d.	s.	d.	s.	d.	
The average wages of the northern counties have been shown to be	11	6					
Their average poor relief per £ on property			1	2			
Ditto per head of population					4	7¾	
Their rate per cent. of pauperato the population							6·2
Contrasted with which are :—							
The average wages of the southern counties	8	5					
Their average poor relief per £ on property			2	0½			
Ditto per head ou population					8	8½	
And their per centage of paupers to the population							12·1

Rather significant these figures, are they not? "Figures! figures! Oh! you may turn them any way." Well, let us try what they will lose in truth and force by being turned another way. My impression is, that they will still uphold the truth we are testing. From Arthur Young we learn that about one hundred years ago things were precisely the reverse of what Mr. Caird now finds them; that wages in the northern counties averaged 6s. 9d., while wages in the southern counties averaged 7s. 6d. And we have reason to know that at those times that the poor burdened, and that crime, wretchedness, and ignorance particularly characterised those regions where wages were lowest, just as they do now. The change of figures only renders my position the more conclusive therefore!

Mr. Grey, of Dilston, lets us into the secret of that change which has passed over Northumberland. And we can trace the same causes, although in less degree, producing the same effect in all the northern counties. This gentleman remarks—

"In contrasting the condition of the peasantry in the southern with those of the northern parts of the kingdom, it would be highly improper to pass over unnoticed the superior education of the latter, and the effect which is produced by it upon their worldly circumstances, as well as upon their moral and religious character. No greater stigma can attach to parents than that of leaving their children without the means of ordinary education, and every nerve is strained to procure it. In the school attached to almost every village, one finds children not only able to read and write at a very early age, but most expert in all the common rules of arithmetic, &c.; and even the young men who labour in the fields often spend a couple of hours in the evening in school, to advance themselves in such acquirements. If occupation alone is a valuable antidote against idle and vicious habits, the acquirement of useful knowledge and the cultivation of the mental faculties must be still more so; and where these are prosecuted, *not* by *gratuitous means*, but *by the produce of economy and toil, it bespeaks a state of society where sobriety is habitual and intelligence held in estimation.*"

Such a statement cannot fail to recommend itself to our better judgments.

I will say nothing respecting the advantages or disadvantages of the hind system, for that is being discussed in the leading articles of this paper; but I must say, that the kindly spirit engendered by it, and the fraternal feeling resulting from modifications of it, are highly advantageous to social progress and well being.

The northern counties, as we shall find from Parliamentary returns, are less distinguished for crime and ignorance—or rather for ignorance and crime, for the latter is one of the consequents of the former—than are the southern.

If we take the average for all England and Wales of the number of the criminal offenders to every 10,000 of the population during the last ten years

at 16·4, the proportion of the northern counties is very much below the average, while that of the southern counties is as much above it.

Taking the average of the number of persons who could neither read nor write in every 100 of the criminals of England and Wales during the years 1839 to 1848 at 31:8, I find, with but few exceptions, the very same results.

There may be several objections raised to this line of argument. They are more apparent than real. I intend to state them anon, to show their invalidity.

No. XVI.

JUSTICE BEFORE GENEROSITY.—JUSTICE *versus* PAUPERISM.—FALSE CHARITY.

It is my desire to maintain that every employer should consider it his conscientious duty, and further, his duty to his country, to pay each man in his employ a fair day's wage for a fair day's work.

The law of supply and demand, as a law to regulate the payment of wages, may do for hard-headed political economists to spill ink upon paper, but its practical effect on our world as at present constituted must be considered as anti-christian and inhuman. It is productive, as I have before shown, of the most dire results.

To offer to the labourer who has a right to a fair share of the produce—*for he is entitled to participate in the wealth he creates*—a bare subsistence money, the beggarly minimum of self-support, is to make him dependent, is to make him a pauper, is to make him a thief, and is to make paupers and thieves of his progeny from generation to generation. If a man has any nationality, will he abet a system like this? We had better die than be unjust! But never will I believe that men *with the spirit to be just* need act against their conscience. Out of this there comes a snivelling and unwholesome charity, bearing loaves, and blankets, and coal tickets, blessing itself at every turn and corner for its disinterested conduct. So is the working-man sapped of the virtue of energy and self-reliance, and taught the demoralizing contrast between the easy comfort of those who beg and the hard privations of those who toil.

"Philosophy, emancipation, pity for human calamity, is very beautiful," says a celebrated author of our own day; "but this deep oblivion of the law of right and wrong, this indiscriminate mashing up of the right and the wrong into a patent treacle of the philanthropic movement, is by no means beautiful; this, on the contrary, is altogether ugly and alarming."

"Laws are unjust, temptations great," &c., &c. Alas! I know it, and mourn for it, and passionately call on all men to help in altering it. But, according to every hypothesis as to the law, and the temptations and pressure towards vice, here are the individuals who, of all society, have *yielded* to said pressure. These are the worst substance for enduring pressure! The others yet stand, and make resistance to temptation, to the law's injustice; under all the perversities and strangling impediments there are, the rest of society still keep their feet and struggle forward, marching under the banner of *Cosmos*, of God, and human virtue: these select few, as I explain to you, are they who have fallen to *Chaos*. A superior proclivity to chaos is declared by these, by the very fact of their being there. If you want the *worst* investment for your benevolence, here you accurately have it. Oh! my astonishing benevolent friends! what sort of reformers and workers are you, that work only on rotten materials? that never think of working on the material while it is sound; but when it has declared itself rotten, you greedily snatch at it, and say, "Now let us try to do some good upon it!" You mistake in every way, my friends. The fact is, you fancy yourselves men of virtue, benevolence, and what not; and you are not even men of sincerity and honest sense.

By grinding down labour to the subsistence point, we create and sustain the popular idea which lies also at the root of our present parochial relief system—namely, that indigence, *however brought about*, is *entitled* to prey upon property.

Honest John Hale on twelve shillings or more a-week, would he not, think you, a thousand times rather supply his own necessities, buy his own blankets, and his wife her own gowns, and his children their own shoes, out of his provident earnings, than be held indebted for them to any person? His manly countenance is suffused with shame and indignation as the week's price of his lad's schooling is tendered him. "May-be," says he, "my boy will come to value it less if it be given to us; and though we are hard put to, to raise it nows and thens, it always brings a pleasant kind o' feeling like."

Poor incompetent Robins with 8s. a-week, who goes to bed insatiate, and resembles the prodigal son so far as that he would after his heaviest repast fain fill his belly with the husks the swine do eat—as to him, he will take anything, and be——*ungracious for it*; for he has still some dim notion in that incompetent head of his that he should receive even this, and more, without being expected to say "I thank ye, sir; you're very good to the likes of me." "Where," it is asked, "is this person's *self-reliance, so essential in the individual* to the good of the common weal?" Starved out. Yes, Landlord; yes, Squire; even

so, Farmer; clean starved out! "But his providence?" Eh, what, sirs! self-reliance and providence on 8s. a-week? You are very facetious; you will ask next, I may suppose, why Robins is incompetent?

> "The prayer of Ajax was for light
> Through all that dark and desperate fight—
> The darkness of that noonday night—
> He asked but the return of sight."

With the same fervency Robins implores justice—not charity; he wishes to be confirmed in manhood—not to be made a pauper.

Fully do I agree with an old writer who says, "No world, or thing here below, ever fell into misery without having first fallen into folly, into sin against the Supreme Ruler of it, by adopting as a law of conduct what was not a law, but the reverse of one; and that till its folly, till its sin be cast out of it, there is not the smallest hope of its misery going; that if huge misery prevail, it is because huge cowardice, falsity, disloyalty, universal injustice high and low, have still longer prevailed, and must straightway try to cease prevailing."

No. XVII.

LOW WAGES, AND THEIR EFFECT UPON WOMAN.

Continuing the line of remark that I was obliged to leave unfinished in my last letter, I have yet to say that in those districts distinguished for a departure from the custom of affording bare subsistence-money in return for labour, we find a people in proportionate comfort and the exercise of self-reliance and providence.

Although I have mentioned the northern counties in a laudatory manner, I am free to confess that I consider them very far from being models—there are many degrees between a body *advancing* to a certain stage and a body that has attained it.

To take a glance of the condition and habits of these condemned *southern* districts, I remark, in the first place, that female labour is more employed than in the northern. This fact never tells well for the character of the population. If the mothers are employed abroad, we know pretty well what the children will be, and what the parents of the future generation will be. If the mothers are seen in the fields, we know well enough that they are *necessitated* to it—that the earnings of the husband alone are not sufficient to maintain life and decency. There is something radically wrong here, for the mother's proper sphere is home; but remove her from her sphere, where her presence imparts life and motion and order, and the simple joys of domestic existence, and Chaos reigns over the social system. I do not say, mind, that the removal of the mother, with the character she *at present* bears amongst the poor, would produce such results; for, owing to the severe circumstance of life, she is not what she would naturally be under a more favourable influence: her faults are owing to the practice I am writing against. Take her even as she is, and I say that society loses by her being employed in out-door work—she blesses and benefits us at home, with rolling-pin and needle and her children round her; but she beggars and depraves us abroad, with her hoe and stone basket.

If the mother is from home, all the benefits which God intended to flow from domestic culture are entirely lost; indeed, not only are they lost to the family thus despoiled of its natural support, but evil in many forms usurps the place they should have occupied. From this source mainly springs that annual tide of juvenile delinquency that so disgraces our calendar of crime, and keeps our scheming benevolent folks always busy. When the mother goes abroad she has four modes of disposing of her children—she sends them to school, she locks them up for the day, she lets them ramble about with their companions similarly left, or she takes them with her into the fields. That state of necessity which sends a woman abroad, is scarcely consistent with the ability to give her children the advantage of schooling; and it rarely happens, as I know from my own experience, that women who go to work do thus provide for the mental wants of their children, particularly in the southern counties. Nor is it very general, unless the children can earn something, to take them into the fields. They are therefore either left alone, or to pick up their morals, as I said before, with vicious companions out of the gutter. The effect of this training upon the girls is most lamentable, as the ignorance and general character of the married women well discover. Everywhere in the districts to which I now allude, and very commonly I admit in the northern districts also, we find the women of the agricultural counties in a state of ignorance affecting the daily welfare and comforts of their families. "Ignorance of the commonest things—needle-work, cooking, and other matters of domestic economy, is described as nearly universally prevalent, and when any knowledge of such things is possessed by the wife of a labourer, it is generally to be traced to the circumstance of her having before marriage lived as a servant in a farm-house, or elsewhere. A girl brought up in a cottage until she marries is generally ignorant of nearly everything she ought to be acquainted with for the comfortable and economical management of a cottage. The effects of such ignorance are seen in various ways, but in no one more than in hindering girls from getting out to service, as they are not capable of doing anything

that is required in a family of a better description. The further effect of this is, that not being able to find a place, a young woman goes into the fields to labour, with which ends all chance of improving her position. She marries, and brings up her daughters in the same ignorance, and their lives are a repetition of her own."

It is true that woman was the main occasion of the fall of man—it is equally true that she is, and may be yet more, the occasion of his rise.

The heathen Romans, well aware that from the mothers of the State would emanate its strength and vitality, bestowed the utmost care and culture upon their females; and shall the Christian English pay a less regard to that fount of national honour, prosperity, and elevation, and hold in servile degradation the very elements of their greatness, unmindful that Christianity, which has raised them above all nations, is the true patron, friend, fosterer, and exalter, of women of all classes?

On surveying the census tables of this country, we find that, of the ages under 14 years, there were more boys than girls existing in society; and that from the age of 14 to the longest period of human life, there were most females alive by 300,000.* From this remarkable circumstance we learn that the relative position in which the female sex are placed by the natural laws of life and death, contribute greatly to their influence on society; we see also that this preponderance of the female element is the greatest in the mature and most effective portion of human life. This occurs at a time of their life when most are mothers; when "men, engrossed by civil and political employment, share but little in the private education, in the daily management, or in the moral or religious cultivation of their household: all this is performed by females; and we see that they are made to be more numerous at the period when they are most wanted for human benefit and improvement."

What then should be our care not to interfere with such a beneficent and wise arrangement? If we are true friends to human progress, we shall be at individual pains to carry this design into effect, and to throw a conservative influence around its results; else are we traitors, socially and nationally so. Our greatest men, with scarcely one exception, agree in speaking in the highest terms of veneration and tenderness of their mothers; and they unite in ascribing to the maternal influence, both of heart and head, their own eminence. Many instances will doubtless occur to my readers—"Plutarch's Lives" abounds with them; and amongst more modern profane biographies, all will recollect how both St. Augustin and Bonaparte laid their laurels at their mother's feet; indeed, so thoroughly impressed was Bonaparte with the importance of the female element of the French nation, that he devoted much attention to its cultivation. He laid it down as a maxim, that the future "good or bad conduct of a child depends entirely on the mother;" and he once said, "If our mothers be good, our men will be virtuous and our nation all-powerful."

But I must conclude: the interest I take in my subject has, I fear, led me beyond my usual limits.

THE HIND SYSTEM OF THE SOUTH OF SCOTLAND AND THE ENGLISH BORDER.—CONDITION OF THE AGRICULTURAL LABOURERS IN LINCOLNSHIRE.

Are there any valid reasons why a system which in the north of England works so well, both for master and servant, in a pecuniary, moral, and social point of view, as the payment of wages in kind to hired householders resident on the farm, should not be engrafted on the agriculture of the south? There are no reasons but those which have been urged against steam thrashing machines, drilled turnips, and every other improvement which, originating in the north, has been reluctantly adopted into southern practice, after at least thirty years of inveterate opposition. The difficulties alleged are peculiar local circumstances, which render such improvement unsuitable beyond the districts in which it originated, or to which it has hitherto extended.

Let us examine in detail the objections which have been urged against the introduction into the south of the hind system of the north. At the head of these stands the oaten diet. Do you wish,

* The statistics of 1851 are even more confirmatory of this theory. I should give the figures, but I have not just at hand all the necessary data. I therefore give those of 1831.

From	15 to 19.....	25,983	more females than males.
„	20 to 29.....	145,558	„ „
„	30 to 39.....	55,845	„ „
„	40 to 49.....	18,618	„ „
„	50 to 59.....	9,956	„ „
„	60 to 69.....	17,675	„ „
„	70 to 79.....	9,616	„ „
„	89 to 89.....	6,728	„ „
„	90 to 99.....	1,027	„ „
„	100 and upwards	69	„ „
		291,105	more females than males at these ages.

it is asked, to reduce the peasantry of merry England to feed on oats, which "surly Sam called horses' food?" When Johnson, in a fit of spleen or of prejudice, defined oats to be "a grain which in England is generally given to horses, but in Scotland supports the people," he wrote that which was not strictly true. He was born very near the southern bank of the Trent; and he ought to have known that throughout England north of Trent, to say nothing of Wales—that in the English counties of Cheshire, Lancashire, Yorkshire, Derbyshire, besides others further north, oats enter largely into the consumption, not only of the peasantry, but of that portion of the middle classes just above the peasantry. The probability is, that in his youth he had fed largely on oaten porridge himself, so nearly does Lichfield border on the oat-consuming district of England. Since the removal of restrictions on the importation of foreign grain, our increased imports have consisted chiefly of wheat; and wheat has, to a considerable extent, superseded oats, not only in the oat-eating counties of England, but in Scotland itself; just as with improved cultivation, the peasantry of West Norfolk passed from rye to wheaten bread.

We do not advocate an oaten diet for the agricultural labourers of the south, though we have a strong suspicion that even they, with all their supposed high feeding, might envy the bill of fare in the cottage of the Northumbrian hind, as described by Dr. Gilly. We have a strong suspicion that the barrel of herrings always in hand, the rack well stored with goodly flitches of home-fed bacon, the home-made cheese and butter, and an abundant supply of milk from a well-fed cow—eaten by a comfortable fire, under his own roof, would have charms in the eye of an agricultural labourer of Norfolk or Essex, even if accompanied by oatmeal porridge for breakfast, and the grirdle cake of oatmeal and peas with his dinner. We have not ascertained whether, since 1848, any change has taken place in the dietary of the labourers of Norfolk and Sussex; but we know that before that date it too often consisted, in Norfolk, of little more than dry bread or hard dumpling, and it is on record in parliamentary blue books that even during the most flourishing period of agriculture, the labourers of Sussex carried nothing into the field for dinner but cold potatoes. We do not advocate an oaten diet for the peasantry of the southern counties; on the contrary, we should have no objection to see wheat displace oats entirely as human food, throughout England, Wales, and Scotland. There is this advantage in the habitual use of the superior kinds of grain by the labouring classes, that in seasons of dearth, such as that of which we have too much prospect before us this year, they have the inferior kinds of grain and pulse to fall back upon. An oat, or barley, or rye, or buckwheat eating population have, under such circumstances, no resource but potatoes; while a potato-fed people, like the Irish, are driven to nettles, sea-weed, and ramps (wild garlic) when the potato fails, which is so liable to failure, and so incapable of preservation from one year to another, that a people with whom it is the staple article of food are constantly hovering on the brink of famine.

What we contend for is to be found in the following propositions:

1. That whatever may be the customary food of the agricultural labourer in any country, his wages ought to be sufficient to purchase a sufficiency of that food for the support of a family, whatever may be its price, and whether he be married or single.

2. That it is better for his employer and himself that he should reside on the farm, close to his work, than that his dwelling should be in a town or village, distant from three to five miles—a system which is rapidly extending, under the clearance of cottages, in close parishes, in the south of England.

3. That there are physical and moral advantages attending the possession of a cow by the agricultural labourer, which render it desirable that every encouragement should be given to his acquiring one.

4. That there are similar advantages attendant on the occupation of a small portion of land, for the amusement of his leisure hours.

5. That it is better this land should be attached to his dwelling, than at a distance from it; and therefore that the much-vaunted allotment system, at the best, is but a poor substitute for cottage gardens, and that, operating as a palliative to a vicious system, and therefore preventing a remedy, it must be regarded as a nuisance rather than a benefit.

6. That nothing secures to agricultural labourers the advantages above enumerated, so much as the system of hired householders, resident on the farm, paid their wages chiefly in kind, those wages consisting in part of the keep of a cow on the farm in summer and winter. In one word, there is no mode of paying the agricultural labourers of the south, so advantageous to them and to those who employ them, as the hind system of the north slightly modified to suit the habits of the southern peasantry.

The following scale for the payment of farm wages in kind exhibits such a modification, which we commend to the serious and impartial consideration of the large farmers of the south. The following would also be the cost to the farmer of such wages at present prices:

	£	s	d.
Wheat, 5 quarters, at 52s.....	13	0	0
Barley (for pig food) 3 qrs. at 40s..	6	0	0
Keep of cow.....	8	0	0
Cottage with garden attached, of not less than ¼ of an acre.....	3	0	0
Coals, 2 tons, or an equivalent quantity of wood.....	2	0	0
Cash.....	4	0	0
	36	0	0

The above sum of £36 is equal to something less than 14s. a week at the present rate of agricultural produce. What it would be with wheat at or below 40s. a quarter and barley at 25s., we leave our farming friends to calculate. The value, however, of these payments to the labourer, as was observed by Mr. Grey of Dilstone and Dr. Gilly, is much greater than their cost to the farmer, for the reasons which have been stated in former articles.

The only reasons, besides those stated in former articles, which we have ever heard urged against the introduction of the northern system of paying agricultural labourers into the south, are the following, all capable of easy refutation:—

The first is, that the southern labourers prefer money wages, and would be dissatisfied with the change; secondly, that they have neither cows, nor the means of procuring them; and, thirdly, that the law of settlement presents an insuperable obstacle to the employment of hired householders.

With regard to the first objection, we cannot help thinking that the feeling of the agricultural labourers, with respect to corn wages, resembles much that of the tenant farmers with respect to corn rents. Among the latter, corn rents are popular when the price of grain is falling, and in bad repute when it is rising. The time to introduce the payment of agricultural wages in kind is a period like the present, when the price of food is advancing, and the change in favour of the labourer. The labourers will be less likely then to object to the system; and the farmer will find the pecuniary benefit of it, when the next revulsion shall take place, and prices begin to fall. There may be difficulties at first, as there are in everything new. The great impediment is the want of confidence and sympathy between the farmer and the labourer, which years of estrangement have engendered, and which have rendered the latter suspicious even of plans sincerely intended for his benefit. It was well remarked by one of our correspondents on the subject of wages, in a recent number, that the "conviction among the poor, that they are regarded as slaves and dependants of the rich, is deeply rooted, has descended from father to son, and cannot easily be eradicated." We have already adduced unquestionable testimony that the system we are advocating promotes the desired confidence and sympathy more than any other.

As to the difficulty which the labourers would find in purchasing cows, it is more imaginary than real. A desire to hold land and become small farmers is strong among the class. The hind is a small farmer, for his own leisure hours and those of his wife. He is, in some degree, a partner with the farmer, enjoying exemption from the risk to which a small farmer is exposed. In situations where there are means in existence for the labourers keeping cows, we find them overcoming the difficulty of procuring them; and we find the possession of a cow forming the line of demarcation between the thrifty and the unthrifty. The labouring class are now in the receipt of good wages, and they require to be taught the lesson of aspiring to independence by habits of economy and forethought. They require to unlearn the lesson of improvidence which was taught them by the system of parochial relief in aid of wages. They require to be taught to save, against a wet day, that portion of their wages which is now squandered at the ale-house. Savings-banks are good things; but a cow and a pig will always be more popular with them. A late popular writer, who knew the feelings of the labourers well, and knew how to work on them, said truly that a pig was the poor man's best saving-bank. A cow and a pig are a saving-bank still better. We have seen how the hinds of Northumberland overcome the difficulty of procuring a cow, or of replacing it when lost. We have seen how, on such occasions, they are assisted by the farmer with a loan, to be repaid by instalments. Why should not the labourers receive the same assistance from the farmers of the south? "It would absorb too much capital," is the reply. This is nonsense. If we allow three men to the hundred acres, and, if we suppose them all hired householders, none of them able to raise the value of a cow except by loan from their employer, they might all (on a farm of five hundred acres) be furnished with a good heifer each—which would grow into value—for less than £200, to be repaid by instalments.

The only remaining objection is the law of settlement. By hiring men as yearly servants, and letting them cottages, it is said they will become parishioners, and chargeable, at some future day, on the rates. To this objection there are many satisfactory answers. In the first place, it is of no force against that portion of the labourers employed on a farm who are parishioners already. The farmer who dreads an increase of poor-rates will do well to select his hired householders from among the existing parishioners. If there is a redundance of labour in the parish, he will have the better

chance; if there is a deficiency, it will be good policy to encourage the immigration of good labourers from other parishes. We put it to any man who will view the question impartially, whether, if the labourer is to look to some parish for support in sickness and old age, it ought not to be that parish in which his days of health and strength are spent in labour, by which the rate-payers have benefited? Is it, we would ask, consistent with reason and justice that the present system of clearing the land of cottages should continue, and that the agricultural labourer should be driven from the rural districts in order that landlords may escape the burthen of supporting him when he is past labour? But the best refutation of objections to the hind system, founded on the poor-laws, is that the same law of settlement is in force in Northumberland as in the south; and that in that county the poor-rates of the rural districts are much lower than in the southern counties, where it is customary to give weekly wages, paid in money.

Lastly, if the law of settlement is the chief obstacle, we may be certain that before long that obstacle will be removed. There is a growing opinion abroad that it must be altered, as injurious to the labourer, by confining him to a restricted market; and as injurious to the employers of labour, by causing a dearth of labourers in one district whilst there is a redundance of unemployed labour in another.

The necessity for an alteration of the law of settlement is very generally admitted. The difficulty is, how it may be best effected against the prejudices, and short-sighted policy, and mistaken benevolence regarding the poor-laws, which long habit has engendered. The great problem to be solved in our social system is, to render the labouring classes less dependant on eleemosynary assistance, and more self-reliant. The time to effect this change is when their condition is as flourishing as at the present moment; and as regards the agricultural labourer, experience has established the fact that nothing produces this desirable result so much as the hind system.

As subsidiary to the arguments which we have drawn, in former articles, from the condition of the agricultural labourers of Northumberland, in favour of the employment of hired householders resident on the farm, we will now look a little into the state of the same class in Lincolnshire. That is probably, on the whole, the best cultivated county in England—that in which the march of improvement has been the most rapid, and in which the farm labourers are better off than in any other district where they receive weekly wages paid in money.

We shall find that there the labourer suffers by residing at a distance from his work; and that, in other respects, he does not so generally possess the advantages which he enjoyed half a century ago.

Our authority shall be Mr. Clarke's prize report on the farming of Lincolnshire, in the twelfth volume of the *Journal of the Royal Agricultural Society*. He tells us that in those parts of the county where the villages cluster most closely, it is common for the men to walk one mile to their work; but that in many districts, particularly where the parishes are thrown into one or two large farms each, one village supplies all the surrounding farms with labourers, who must travel three or four miles to and from their work every morning and night. He tells us also that the population is very unequally distributed, and that the cause invariably assigned is the reluctance of parishes and proprietors to rebuild old houses, or to erect new ones, from a wish to keep down the population in their respective parishes, in order to keep down the poor-rates.

The labourers are consequently driven to those parishes where there are numerous small freeholds. There they are able perhaps to hire an acre of land at £5 an acre, which is cultivated by their families, out of reach of paid employment, while the men are obliged to walk two, three, and four miles to their work. This system, which Mr. Clarke very properly denounces as inhuman, unjust, and impolitic, he traces to the law of settlement, and thinks that it can only be remedied by a union rating.

"It is inhuman," he says, "to compel the poor to live in a place far removed from their work, thus imposing additional hours of labour and fatigue upon them, and to force them to pay heavy rents for mean dwellings, in consequence of undue competition in the freehold villages. It is unjust to accumulate hardships upon the toiling classes, to rob them of the time which might be devoted to the improvement of their mental and moral faculties, and to deprive them of opportunities of adding to their domestic comforts. It is unjust to the parishes in which the labourers herd together; the rates, of which the neighbouring but unneighbourly parishes are relieved, falling with greater burthen upon the populous ones. The system is likewise unwise, not only as a shirking of honest liabilities by those who ought to pay them, but it is (contrary to design) an actual increase of the whole poor's-rate; for how can the privations of insufficient house-room, accompanied by extra labour, tend to anything else but a wider degree of suffering, and a wider demand for relief? The practice, moreover, is not only disgraceful, but impolitic; for how are the labouring population to respect and honour the higher classes under such

treatment as this, when, from the doubled value of the land, the least that could be expected is that the proprietors should provide suitable houses, at low rents, for the class by whose industry they have profited? It is unwise and imprudent, because the farmers also suffer by it. The men will not go to the more distant occupations until every resource fails them nearer home, and distress obliges them to this extra toil; so that hands are often scarce in remote situations. Again, in some critical seasons, when workmen must be had, they will not labour for the usual number of hours, in consequence of their long morning and evening journeys, and the farmer has to employ extra men to make up for this loss of time.

"This is therefore a question between landlords and tenants, and in the present state of things, the latter feel entitled to claim every reasonable advantage.

"Finally it may be safely inferred, that whatever tends to the improvement of the labourer's condition is a benefit to the farmer and landowner, and a profit to the whole community; and that anything which injures and degrades his social well being, is also a loss to the perpetrator, and a wrong to society."

This is very true, and admirably stated. The clearing system is inhuman, unjust, and impolitic; and we wish the writer had insisted more on the impolicy of it, and the loss which it entails on the farmer, and through him on the landlord by wasted labour. In this point of view it is, as Talleyrand said, worse than a crime—it is a blunder.

Interest will ever weigh more with the majority of men than duty; but when duty and interest coincide, there is more hope that the course indicated by the former will be adopted, than when they point in opposite directions.

We will therefore endeavour to estimate the pecuniary loss incurred by the farmer, whose labourers reside at a given distance from their work. We have seen that in Lincolnshire this distance is frequently three and four miles, and we know farms in Norfolk on which a large portion of the labour is performed by those who have to travel five or six miles every morning, and the same distance every evening.

An average day's work in ploughing may be called an acre, and the average distance travelled in ploughing it twelve miles. The man, therefore, who lives three miles from the farm, does an extra half day's work in travelling to and from it. This is either so much loss to the farmer, or so much additional fatigue imposed on the labourer. In the latter case the loss must eventually recoil on the farmer; since this additional toil, continued from day to day, must, in the long run, abridge the working power of the workman.

Whoever will take the trouble of following out the details of the calculations will find, that allowing three men to the hundred acres, and supposing them all to reside three miles from their work, this wasted power amounts in the course of the year, on a farm 500 acres, to 2340 days of one man worth, at 2s. a day, £234.

If we allow £60 as the cost of building a labourer's cottage, the saving of the sum thus annually wasted would be sufficient in two years and a half to build all the fifteen cottages required, on which 5 per cent. might be charged as rent. The same sum saved during one more year, would be more than sufficed to purchase cows for each labourer by means of a loan, to be repaid, with interest, by instalments.

The subject is well worthy the consideration of those who are hiring land, on a lease for twenty-one years, from landlords who are reluctant to incur the expense of building cottages on the farm for the labourers necessary for its cultivation. If the landlord will not build them, it would pay the tenant to do so, unless prohibited under the dread of the law of settlement. The farmer, whose horses should be stabled three miles from their work, would need no argument to convince him of the loss which he incurred thereby: he would ask his landlord to build stables on the farm, or would endeavour to make some arrangement for building them himself. There is no law of settlement, however, for horses; and there is for labourers.

Cows are still kept by the agricultural labourers of Lincolnshire; but they are not so numerous as at the close of the last century. For this fact, as well as for the distance at which the labourers generally reside from the farms, our authority is Mr. Clarke's prize essay on the farming of that county, to which we have before referred. His information respecting the condition of the labouring population was founded partly on his own observation, and partly on the communications of more than twenty of the principal farmers whom he consulted; and these details, thus collected, he contrasts with the more ample information contained in Young's report of 1799.

And first, as to the price of provisions, an important element in all estimates of the command given by any amount of money wages over the necessaries of life. Half a century ago there were greater variations than at present in the price of wheat, in different parts of the county. This difference, which in 1799 amounted to as much as 26s. the quarter, or thirty per cent., has been equalized by the modern facilities for internal com-

munication. The average price per imperial quarter, for the whole county, for 1797, '8, and '9, the period over which Young's report extends, was about 46s. Mutton averaged 5d. the pound; pork, 5s. to 6s. the stone; potatoes, 3s. the sack; coals 18s. the chaldron.

Boston market is assumed by Mr. Clarke as a fair criterion of the average prices of the county at the present time; and he finds that wheat was about 44s. the quarter in 1849, mutton 5d. the pound, pork 5s. the stone, potatoes 5s. the bushel, coals 22s. for the same measure as before. There is, therefore, little difference between the prices of food at the two periods. On the one hand, clothing is much cheaper; but, on the other, the potato failure has enhanced the cost of pig-feeding, which is an important consideration with the Lincolnshire labourer. Comparing the rate of money wages at the two periods, we find that in different parts of the county they varied, in 1849, from 10s. to 12s., and in some districts 15s. a-week. Mr. Clarke considers the average of the county as above 11s. In 1799 Young spoke of Lincolnshire as the county in which wages were higher than in any other part of the kingdom, poor-rates lower, and able-bodied paupers fewer. He estimated the average weekly wages at 11s. 6d. It is notorious that in the interval the rental of the county has increased 87 per cent.; while in this, the best cultivated district in England, the very Elysium of the agricultural labourer, his command over the necessaries of life has, to say the least of it, remained stationary. Are the landlord and the farmer to be the only parties benefited by those improvements in farming which increase the produce and diminish the cost of raising it?

In some respects the condition of the labourer has retrograded even in Lincolnshire. "It is impossible," said Young, in 1799, "to speak too highly of the cottage-system of Lincolnshire, where land, gardens, cows, and pigs are so generally in the hands of the poor. On views of humanity and benevolence, it is gratifying to see that class of the people comfortable, upon whom all others depend. Wherever that system is found, poor-rates are low. And another object yet more important, is the attachment men must inevitably feel to their country when they participate in its prosperity."

In corroboration of these views of the benefits which result from the cow-keeping system to the rural labourers is the testimony of Mr. Gourlay, who, in 1800-1, visited eight villages in Rutland and thirty-two in Lincolnshire, as reported in the "Annals of Agriculture." The average population of these villages was 326. In each village he found at least fifteen cottagers keeping cows, and occupying, on the average, 6½ acres.

In those parishes where the cottagers had cows the poor-rates averaged 1s. 5½d. in the pound; in those where few or no cows were kept they were as much as 5s. 11d. Mr. Gourlay gave, moreover, a table, showing that the poor-rates increased in exact proportion as the number of cottagers keeping cows diminished.

"At the present time," says Mr. Clarke, writing in 1849, "gardens are very generally attached to the cottages; but the six acres of ground have been much curtailed, and the cows are comparatively rare." Most of the cottagers still keep pigs, to the number of one or two; but wherever new cottages have been built, land sufficient for the grazing of cows has not been attached to them.

The districts of Lincolnshire, in which at the present time the greatest number of cow-cottages are to be found, are the Heath, the Isle of Axholme, and Holderness. On the Wolds they have generally a garden sufficient to feed one or two pigs, but there are comparatively few cottagers who are able to keep cows.

Even among the wealthy farmers, or, as Professor Johnston has called them, the proud hunters of Lincolnshire, the good old custom of boarding farm servants in the house has not been wholly discontinued. From two to three or four, and on the Wolds seven or eight, young men are lodged and fed in the farm-house; their fare—bread, bacon, milk, and beer. Payment in kind is not common, but task-work is very generally adopted, at which the men could earn, in 1849, 2s. 6d. a day. With respect to the general diet of the agricultural labourers of Lincolnshire, we learn from Mr. Clarke that few families make their own bread, except from their gleaned corn; they generally buy the finest white bread. He justifies the practice not only on the plea that they who work hard for their living are entitled to choose their own food, and ought to have the best of the plainest fare, but also on the ground of economy. He argues, that, though comparing equal weights of the finest and "thirds" flour, the latter would cost from 1s. to 1s. 6d. per week less than the former, and would be more wholesome and nutritious; yet, the brown bread being more agreeable, experience has shown that people eat more of it—a view of the case which he deems to be confirmed by the general practice of those who are interested in spending their own money to the best advantage.

Something, he adds, might be said about improvidence, intemperance, and unthriftiness; much about the extended means of education enjoyed by the humbler classes in Lincolnshire, and the respectable appearance of its labourers on Sundays;

and but for the length of his report, he tells us he would have enlarged on the moral benefits of cottage flower-gardens, and have passed "an eulogium on that most useful and inestimable, but much maligned animal, the hog."

Among the farmers of most counties there is a jealousy of the labourers keeping pigs. We know, however, one large farmer on the Wolds of Lincolnshire, who will not employ a man who does not keep one; and, in this respect, we understand that he is not singular.

Comparing the physical and moral condition of the rural labourer in Northumberland, who is hired by the year, and paid chiefly in kind—the keep of a cow always forming part of his pay—with that of the same class in Lincolnshire, where money wages and task-work prevail, the advantage appears to be with the former. Whether the two would be more on an equality, were the old cow-cottages of Lincolnshire, with their six acres of land, restored, and the residence of the labourer brought nearer to his work, may admit of a question. The great advantage of payments in kind over money wages is that they always keep pace with any advance in the price of food. In every district, whether wages be paid by the year in kind, or by the week in money, a number of cottages, with five or six acres of land attached, are desirable, as a source whence occasional labour may be derived for that work which is now performed by itinerants, or by residents who are mercilessly dismissed to the parish when the busy season is over. They are desirable also as an humble kind of independence to which the labourer may hope to raise himself; but the keeping of cows by the population who labour on large farms will, in the present state of things, be more generally and easily effected, by making the keep of a cow on the land of the farmer part of their wages.

NUTRITION OF PLANTS.—THE LOIS WEEDON SYSTEM OF FARMING.

The two classes of theories relative to the nutrition of vegetables, and to the science of chemico-physiology generally, have each led to their own class of practical experimentalists. One class of chemists insist that the atmosphere alone is the source of all the organic elements of nutrition to plants; and another class either contend for a partial or an entire supply being necessarily obtained from the soil. The former contend that, if the soil is regularly and fully supplied with an adequate quantity of the inorganic or ashy materials of plants, a succession of any kind of plants may be expected to follow; the other, equally certain they are correct, demand an ample supply of all kinds of manure, organic as well as inorganic, to enable the soil to mature the crop with any degree of agricultural success.

Experiment has abundantly shown, despite all controversy, that there is a certain amount of grain which a soil will produce after all the manure has been carefully exhausted—year after year a regular quantity, varying with the season a little, yet pretty uniform generally; and for the elements of nutrition this crop seems to depend on the atmosphere alone. Keep the land clean, and the atmosphere will afford enough carbon and ammonia to produce fourteen or fifteen bushels of wheat per acre; while the soil will supply *that quantity* with lime, and soda, and potass sufficient for the wants of the crop. Mr. Smith, of Lois Weedon, following the Tullian principle, and carrying out the views of the atmospheric chemists, goes on year after year growing crops of corn without any addition of manure; and contends that the "clouds drop" enough of fatness to enable the farmer to grow a full amount of produce. But he starts with land newly taken out of grass, and therefore has a very abundant supply of the elements of crops laid up in the soil, which he may gradually call upon to produce his crops, and eke out what the stirring of the soil can secure from the atmosphere. But when the same experiments are tried by others in less favoured situations and circumstances, a somewhat different result has been found to follow. The Rev. Sir G. S. Robinson, Bart., commenced the Lois Weedon experiments with a determination to carry out to the letter the recommendations of that system; but, with all his prejudice in its favour, he had the misfortune to select what it must be tried upon in general practice—the *old going* land, and not fresh land, as was the case at Lois Weedon, at least in one instance. He tried it three years in succession on four-and-a-half acres of fair old arable land, with a favourable subsoil, consisting of good loam and sand. In the year 1851 he sowed nine bushels on the field, just two bushels per acre; but he does not say what was the kind of wheat, which may be of considerable importance; and he had a produce of twenty-six quarters five bushels on the quantity, or about forty-eight bushels per acre. This was certainly a great encouragement to go on with the system; and had the trial stopped here, we should have had a most striking case of the success of what is sounded in our ears as the "spirit of Lois Weedon." But the same experimentalist had evidently

started with a soil in a very high state of cultivation. In 1852 he again sowed the same land, and the produce was fourteen quarters and four bushels, or only some little more than half the quantity of the preceding year—showing, indeed, this depleting system on a soil well-farmed, which brought down the produce of forty-eight bushels per acre to what it was in this year, or twenty-six bushels per acre. In 1853, the same land produced again only twelve quarters six bushels, showing again a diminution of the produce, and bringing to the cultivator only about the average of an ill-farmed district, some 21 bushels per acre. The probability is, not that the system helped to do this much, but that it brought down Sir G. S. Robinson's land to the *minimum* of produce, or, in other words, to the *natural* produce of the soil.

The Reverend Baronet, anxious no doubt to support his clerical exemplar in corn-growing attempts, shows that the system is *profitable*, because it left more profit with the small than the large quantity. Thus his profit was, he says, £8 on the 4½ acres, and this year he thought it would be £10. This might be. It shows how a low farmer may go on drawing the stamina out of his soil, and make a profit out of the unexhausted improvements of his predecessor; but assuming them to have been the same in the whole period, the given produce would show a strange loss to the grower in the last as compared with the first year of the experiment. Thus:—

	£	s.
In 1851 the corn produced, at 5s. per bushel.....	53	5
In 1852 „ „	29	0
In 1853 „ „	25	10

Or, taken by the acre, it was:—

	£	s.
In 1851	12	0
In 1852	6	10
In 1853	5	5

A more striking fact perhaps could hardly have been advanced. But there is another light to show how disastrous this must be to the community. If the quantity had been 450 instead of 4½ acres, the produce would have been brought down from say 2,900 quarters to 1,650 quarters, and all the rest would in any one year be a loss to the country. But it may be urged that this land, contrary to all ordinary cases, produced corn every year, and that thus, in the three years, far more was produced than in ordinary land. But if a judicious green crop had been introduced between, and the stamina of the soil kept up, we might have expected a crop in 1853 as good as in 1851, and thus more wheat would have been produced in two years than there was in the three.

We cannot advise those who wish to grow crops of a character to pay themselves, and benefit the community, to avoid the use of manure, even though they may be tempted by any amount of profit. The Lois Weedon system has not had amongst its advocates many who can show improved crops, at least; and we know of few landlords who could wish for all this care in cultivating if the manure were absent.

We shall be glad to hear of any such experiments, for though we have never been in love with the anti-manuring system—nor any system of the same nature—we can readily understand how cases may happen when, from peculiar circumstances, a different result will follow.

GEOLOGICAL INVESTIGATIONS.—LORD BERNERS' SYSTEM OF DRAINING AT KEYTHORPE.

The last number of the *Journal* of the Royal Agricultural Society is very strong in articles on geology. It contains one by Professor Johnston, on the relations of geology to agriculture in North America; another by Professor Way and Mr. Paine, on the silica strata of the lower chalk; and a third by Mr. Trimmer, on the cheap and efficacious system of draining so long practised by Lord Berners, at Keythorpe, and on the geological conditions on which its success depends.

On each of these papers we shall have a few remarks to offer, beginning with that last named, because it is of the most immediate interest at the present moment. Questions respecting the drainage of land, important at all times, acquire tenfold importance after such a season as the last, and with the prospect before us of a season very similar.

The agricultural interest, therefore, cannot be too speedily and too extensively made acquainted with the fact that a system of draining which differs in many important particulars from the methods now in vogue, and which appears so superior to them all as to be likely to effect a complete revolution in the present practice, has arisen on the lias clays of Leicestershire, and has quietly and unostentatiously reached maturity, while the advocates of deep and shallow draining, of draining at narrow or at wide intervals, have been disputing about the merits of their respective systems. The system of draining practised by Lord Berners is both new and old—new, because it is only now

being brought into public notice; old, because it has stood the test of fifteen years' experience. It is a system of deep and parallel, but not equidistant, drains. Its efficacy is such, that on stiff clays so drained, sheep consume the turnips on the ground, without injury to the land or to themselves; and that it has doubled the value of the poorest soils to which it has been applied. Its economy is such, that for every thousand acres of land so drained, it will effect a saving of from £1,250 to £2,500, according to local variations in the price of labour and materials, as compared with the system of equidistant drains, at such intervals as are admitted to be the greatest which can be generally adopted with safety on clay soils—namely, from eight to ten yards.

The applicability of the new system is by no means confined to the lias clays. Its advantages result from paying attention to certain subterranean furrows or channels, which are of very general occurrence between the retentive subsoil and its more porous covering. These furrows are of irregular depth, but average from three to four feet. The depth and direction are determined by trial-holes, and the drains are laid across them. As the furrows generally, but not invariably, run in the direction of the line of greatest descent, the parallel drains on the system of Lord Berners are generally, but not invariably, oblique to the fall of the surface, and become in effect submains to the natural drains formed by the channels before-mentioned. The main drains under this system are in the direction of the fall. These conditions are the reverse of the present prevalent methods of draining.

The Keythorpe system is based on geological principles, and more particularly in that neglected department of the science, the geology of the surface, or of the superficial deposits. These deposits, which are not shown on our geological maps as at present constructed, but are supposed to be removed in order to exhibit as the surface the rock which is nearest to the surface, have received till lately but little attention. They have been passed over with scarcely any notice as the loose covering of the earth, or have been investigated solely with reference to questions in theoretical geology respecting the causes by which they were produced. When it is known that they vary in depth from six inches to more than 300 feet, and that they are distributed over the greater part of the British isles—and not of the British isles alone, but over nearly the whole of the northern hemisphere—their importance in an agricultural point of view, and their influence in modifying the characters which the soil would derive in their absence from the rock on which it rests, must be obvious. The furrows between the soil and subsoil, which exert such an important influence on the economy of draining, were first brought under notice by Mr. Trimmer, in various communications to the Geological and Royal Agricultural Societies. In a lecture, also, before the latter, on the "True Relations of Geology to Agriculture," he insisted on the agricultural importance of the superficial deposits formerly lumped together under the name of "diluvium," and more recently under that of "northern drift," and "drifts." He divided these deposits into boulder clay, or lower erratic tertiaries, rolled gravel of the upper erratics, and warp-drift. He showed how the warp-drift influences the distribution of soils, and fills furrows and cavities in the bed on which it rests, whether that be a member of the erratic tertiaries or some of the older strata; and he suggested that the contradictory statements which abound as to the results of draining at certain depths and intervals might perhaps be reconciled in many cases by observing whether the drains are laid in the direction of these furrows or across them. In confirmation of these views, he stated that the farmers near Guildford had found that when a soil rests upon a subsoil of clay thus furrowed, drains laid across the furrows and ridges dry a much larger extent of land than drains laid in the direction of them.

In the discussion which followed, Lord Berners observed that if what Mr. Trimmer called furrows and ridges were the same as what in Leicestershire are called "clay banks," he could bear testimony, from long experience in cutting his drains across those clay banks, to the soundness of the views then announced.

On a visit to Keythorpe, shortly afterwards, this gentleman ascertained the presence there of the three varieties of the superficial deposit above mentioned, namely, boulder clay, upper erratic gravel, and warp-drift. He also ascertained that the clay banks of Leicestershire are ridges, separating furrows filled with warp drift which rests on the lias, the boulder clay, or the upper erratics, whichever happens to be the bed, which, owing to denuding operations, is nearest to the surface. It rarely occurs that science and practice play so beautifully into each other's hands. Furrows and ridges between the soil and subsoil, at the depth of three or four feet, are pointed out by a geologist as a general fact, and it is suggested that advantage may be taken of them to facilitate the drainage of land. It then appears that Lord Berners had actually availed himself of the aid of these natural subterranean channels by crossing them with his drains, for fifteen years, on a large scale, and with complete success, and that his Lordship had thus worked out a great improvement on the prevalent

practice of draining, by the process of trial and error, without reference to any geological investigations. The new system of draining, even fortified by such long experience of its value, will have much prejudice and opposition to encounter before it will become general. Had it rested merely on a scientific suggestion, it would have been scouted as "all theory."

This paper has been before the public since June last, and as yet we have seen no attack on it by the advocates of any of the prevailing systems to which it is opposed, though not more than they are opposed to one another! What is the reason of this? Are they reluctant to admit its facts, and the principles deduced from them, and yet unwilling and unable to deny them? Is the estate of Lord Berners efficiently drained, or is it not? If it is, then we would ask, is a saving in draining of £1 10s. to £2 10s. an acre worthy the attention of landowners and farmers, or is it not?

M. LAVERGNE'S ACCOUNT OF THE GLOUCESTER MEETING.

There is a natural and pardonable curiosity in the minds of most of us to know what neighbours may think of ourselves and our proceedings. The less habituated, too, these may be to our customs and our country, the greater the anxiety, perhaps, to have their opinions. The expression of such, moreover, can scarcely be but attended with some advantage. Our own immediate friends, educated in the same school and experienced in the same practices as ourselves, may pass over many a flaw, which may nevertheless strike quickly enough on the less-tutored eye of the stranger. If these be only regarded in the fair and liberal spirit they should be, he will tell us our faults while he admits our virtues, and leaving us to amend the one, proceed himself to imitate the other. The benefit here should be mutual, and the teacher and the pupil in turn change places.

Some such liberal-minded a critic is the French gentleman who in the new number of the Highland and Agricultural Society's *Journal* writes his countrymen an account of the Gloucester Meeting. He is, indeed, if anything, but too well satisfied. The most enthusiastic member of the Council could hardly put the good the Royal Agricultural Society of England has done, and is doing, with greater sympathy, or in stronger terms, than those which come from the pen of Monsieur Lavergne. A clear-headed man, who has evidently taken great pains to become acquainted with that he reports on, almost everything in the week's proceedings appear more or less to delight him. The compliment becomes the higher from the ability of him who pays it. It should be understood, however, that the paper was not written expressly for the *Journal* it appears in. It was addressed originally to the Editor of the *Revue des Deux Mondes*, from whom the Messrs. Blackwood obtained permission to use the present translation. With the permission of these gentlemen again, we shall indulge our readers with a few samples of its style.

Our visitor commences with a brief, but at the same time very correct, summary of the object and progress of the Royal Agricultural Society. He shows how it has become "a most useful and national institution;" while he regrets there is none in France "exactly corresponding to it." Of course we could not get on without fashion; or, at least, a Frenchman could not, without being allowed to talk of it. Here is a bit in the way of prologue; thoroughly French in its manner, but more or less true in its estimate. Agriculture with us, no doubt, *is* coming rapidly into fashion.

"A fortnight ago all the walls of London, and other towns of England, were placarded with large bills, announcing the Gloucester Agricultural Show for the 13th of this month. All the newspapers had previously given the particulars of it. It was almost as much talked about as the Chobham Camp and the great review by the Queen. Here, as soon as a question of agriculture is proposed, attention is awakened; those men who are not concerned in agriculture affect to be interested in order to be with the fashion. There are few wealthy families who have not one member at least in the Royal Agricultural Society; and in the most fashionable world, agriculture is one of the most favourite subjects of conversation."

The old, dull City of Gloucester, too, had dressed itself out quite in accordance with the tastes of our neighbours, to whom a meeting of any kind is nothing without it is a *fête*. In M. Lavergne's emphatic record, "the town had got up things well." And this is the way she did it:—

"All the streets were adorned with triumphal arches composed of foliage, all the houses decorated with national flags, garlands of flowers forming devices appropriate for the occasion, as 'Success to Agriculture!' 'God protect the plough!' The word 'Welcome' everywhere inscribed, the whole population on foot, mountebanks, perambulating shows, ballad-singers, vendors of fruit and ginger-beer; everything had a festive appearance."

If our gathering had been in Paris it could not

have been better. Flags, garlands, arches, mountebanks, ballad-singers—all in honour of, as all devoted to "Success to Agriculture." There was one little drawback, however. When another French gentleman, some years since, visited Doncaster Races, he called it "de guinea meeting." It was de guinea for everything—de stand, de bed, de stall, de dinner, and so on. Our more recent arrival reckons up his expenses in something the same spirit. The half-crown one day to see the implements, the half-crown the next to see the cattle—a shilling here for one catalogue, a shilling there for another; and then, the yet more serious charges in the ancient city that "had got up things so well"—the thirteen francs for a bed for "one night alone," and so forth. We must certainly give the good people of Gloucester every credit for a thorough knowledge of "war prices." We remember but few places in which "the festive appearance" was ever better paid for. Our philosophic friend, however, draws a favourable deduction even from this. It proves how strong the "ardour of the English" is in the cause; and he doubts greatly whether, "if in France the love of agriculture would have attracted so many people on such terms. I am told that, at the last meeting at Orleans, the expenses of which were all defrayed by Government, and the distance only thirty leagues from Paris, the attendance was not very numerous; at Gloucester, more than 40,000 persons paid at the door for admission."

It would be impossible in the course of one article to follow M. Lavergne through his account of both the implement and cattle departments of the show. We may still return to the report on some future occasion—abounding as it does not only with details which are interesting, but suggestions that may be useful. For the present we must confine ourselves to the alpha and omega of his story. Nothing, then, seemed to give him more satisfaction than the dinner, "although the price of the ticket was ten shillings, or twelve francs fifty centimes." After a list of the more distinguished of the company, and a word to "the excellent custom they have in England of inviting foreigners of distinction, as well as the important personages of the country, to these grand assemblages," he thus proceeds—

"Everything went off with that order peculiar to the English. No one touched the dishes before him till the president had pronounced the few words of blessing customary in England, which is the signal to begin the entertainment; and there was a pause after dinner until the president said a few words of thanks in conclusion. In my corner I admired the universally-respected religious customs—that forbearance of so great a crowd before a service necessarily short, and especially that general kindliness depicted upon the good-natured countenances of the farmers."

Here is another word for the farmers. We transplant it, of course, with some little reluctance, embodying as it does a compliment to ourselves as well as to our friends; however, it came unasked, and is so certainly the more appreciated.

"They seemed to be capital fellows (*bien braves gens*), and quite up to their business. During the whole journey they did not speak a word which had not reference to agricultural matters. They appeared to be quite up to all that was going on in farming from one end of England to the other, and were no doubt assiduous readers of the *Mark Lane Express*, and the *Farmer's Magazine*."

We shall conclude our extracts, at least thus far, with another compliment to the whole nation, and one that redounds equally to the credit of the man who pays it. Let us remember it is a Frenchman writing for French readers—

"The period for toasts had arrived, and the president commenced by giving, as usual, amidst profound silence, the national toast of 'The Queen and royal family.' The whole assembly, standing, responded to it with that traditional enthusiasm and the ten volleys of 'hurrahs' requisite on such occasions. I have now many times assisted at the performance of this formality, indispensable at every English meeting; and it is never without emotion that I witness this great people renew with pride that mark of respect and love for the personification of National Majesty. The name of the Queen presents to the mind of every Englishman the whole of that political organisation which forms at once the power of the country and the liberty of each of its members; and certainly this demonstration is never better displayed than in connection with agriculture, which owes all its prosperity to that constitutional government, the history of which is so closely identified with that of the House of Hanover."

WITHAM LABOURERS' FRIEND SOCIETY.—On Thursday the annual meeting of this society was held under the presidency of Lord Rayleigh, and without any abatement of spirit or interest in the proceedings. The ploughing took place on Powers Hall, in the occupation of Mr. Wm. Hutley, who provided for the visitors a liberal luncheon at Post Hall. There were forty-three ploughs on the ground, and a great portion of the work was beautifully executed. The show of vegetables was good; that of potatoes the best we have seen in the county. The prizes were distributed on the ground at three o'clock by Lord Rayleigh; his lordship prefacing their delivery with some feeling and appropriate observations.

THE PESTS OF THE FARM.

The local papers have been full, of late, of marvellous accounts of vast swarms of "flies," of "midges," or of "insects," as they have particularly or generally described them, and these have been attributed alternately as a cause or an effect of that state of the atmosphere which induced the cholera. In one part of the country they were described as "a shower of flies," in another as "a cloud which thickened the air like a mist," and in another as "swarms of midges which rendered breathing or moving about difficult, from the constant liability of the midges getting into the eyes or mouth."

The phenomenon is not, however, a new one, and is as far from any peculiar influence either of the cholera or upon it, as any two concurrent circumstances can possibly have. They are the winged aphis or plant louse, either searching for a new locality, emigrating to some fresh plant or range of country, or, what is more likely, obeying that peculiar law which induces animals, or insects particularly, to congregate together just before the period of their existence is terminated. They are the vast accumulations of aphides from an extensive range of plants, fostered perhaps by the peculiarities of the season.

We have witnessed, in nearly every kind of locality, how the carrot has this year suffered. The whole leaf-system has been shrivelled and denuded of its juices. It has been extremely small in its foliage, and what has been left of it is red and discoloured, instead of being a healthy green. A little minute inspection showed that these changes were due to the carrot plant-louse (the *Aphis dauci*); and to this, amongst a variety of other plants, is due the vast accumulations of insects mentioned in the local papers of the second and third week of September.

Nor were the peas free from the same pest. Those who observed the green forsake the foliage, and a grey mildew kind of smother take its place, and who saw numerous flocks of swallows skimming over the tops of the fallen plants, might have observed a complete cover of the pea-plant louse (the *Aphis pisi*), and these would add to the hosts of plant lice to which so much reference has been made.

But it will also have been observed how many fields of turnips have of late lost most marvellously their thrift and colour. From a peculiarly healthy green, they have become a sickly pale colour inclining to yellow. The leaves begin to stand erect, and the bulb to stop growing. They have not made the progress since the rains which might fairly have been expected. The cause has been the turnip-leaf plant-lice (the *Aphis rapa* and the *Aphis dubia*), and they, obtaining wings at this period, have added to those from the beans, the currant and gooseberry bushes, the lettuces, and the forest trees also, to make those clouds of insects which have excited so much curiosity and so much wonder. A few of the hop fly, and doubtless amongst the rest Mr. Smee's *Aphis vastator* may be found holding their orgies in the bright and warming beams of an autumnal sun.

These visitations are by no means uncommon. White in his "Selborne," relates a story of a shower of aphides which "fell" there one afternoon in August. "They who were walking the streets at the time found themselves covered with these insects, which settled also on the trees and vegetables, and blackened all on which they alighted. These armies were no doubt in a state of emigration, and shifting their quarters, and might perhaps come from the hop plantations of Kent and Sussex, the wind being in the north."

The Journal of a Naturalist also gives a similar instance. He says: "The air was so full of them that they were incessantly flying into my eyes and nostrils, and my clothes were covered by them; and in 1814, in the autumn, the aphides were so abundant for a few days, in the vicinity of Ipswich, as to be noted with surprise by the most incurious observer." Major mentions a similar instance in September 1829. In 1838 there were also very similar clouds, especially in the turnip districts, and Mr. S. P. Gill and Mr. Milburn had a long controversy as to whether these were the cause or the consequence of the turnip disease that year, when clouds darkened the air at Mansfield, Doncaster, and similar places. This appeared in the *Farmer's Magazine* of that autumn.

Nor are these immense swarms of insects at all wonderful, when the amazing power of reproduction in these "northern locusts" is known. A single female will, it has been shown, produce eleven generations successively without even coming in contact with a male. She seems to be born with an impregnated ova; for the experiments of Bonnet, of Duvan, of Bazin, of Trembly, and several others, show this to be beyond all possibility of doubt. The first-named naturalist seized a specimen which he saw born, isolated it immediately, and watched it daily from the 20th of May;

but it brought forth a young one on the 1st of June, without being in contact with a single other aphis of any kind, and in three weeks it had brought forth ninety-five young aphides. Reaumer calculates that a single female may produce nearly sixty hundred millions in five generations, whilst Dr. Richardson makes the seventh generation to number what we will not venture to say in words, but in figures stands thus, 25,065,093,750,000,000,000.

It is no wonder, therefore, that plants often suffer amazingly from these insects. A single female, piercing a turnip or other plant below the leaves, deprives it gradually of its juices, while she is breeding at this astonishing rate. The leaf soon recedes from this, and blisters, affording an additional security for the insects. At first the female is viviparous, and produces live young ones, which, as we have seen, are capable of reproducing without the access to the male: she may go on producing five, seven, or nine generations, till towards the close she produces eggs. Some of her brood are winged, some wingless; but all the males have wings, and generally appear in the sunny days of autumn—to be caught, the swallow having gone, by the filmy gossamer, spread by the minute gossamer-spider over a thousand times ten thousand bushes.

Remedy for these we know none. Smoke they cannot endure, or at any rate it mightily checks their progress; but when will farmers begin to protect the swallows, and the wrens, and the hedge-sparrows, who are the only real check he can foster of these most destructive of all "Pests of the farm?"*

We trust a better understanding of these swarms of insects will ere long exist amongst agriculturists than at present; but very little, apparently, being known by farmers respecting them.

SEED-WHEAT, AND ITS PREPARATION FOR SOWING.

This is an important subject, and deserves the most careful attention of every farmer. The choice of wheat for seed has been long considered of great moment in promoting a farmer's prosperity. A wrong selection of seed will yield no rent; while a judicious choice will yield both rent and profit. This is often proved. Upon whatever variety the farmer's choice may fall, he ought to select the best sample of it that he can meet with. I would as soon use an inferior ram to my flock, or an inferior bull to my herd, as sow an inferior grain, be it from whatever well-known stock. "Like is said to produce like." Be this as it may; with respect to grain, the probability is much in favour of *good grain* producing *good grain*, and good crops of it too. The varieties of wheat are now so very numerous, that much difficulty arises in making a proper choice. Varieties suited to every soil and climate are now generally grown throughout the kingdom, and the facilities of railway transit are so great, that every farmer may, with ordinary care, suitably supply himself, provided he is acquainted with the nature and habits of the precise variety he wishes to obtain: the soil and climate he can readily ascertain, but not so the grain—the same varieties being sold under different names in their respective districts. To obviate this, he ought to make periodical exchanges with farmers who are well known to him, and occupying other soils and other climates, (for climates differ according to elevation and other circumstances), of those varieties he finds it to his interest most to cultivate: he can thus keep to his profitable variety. As a general rule, the exchange should be from a cold to a more genial climate—from a chalky soil to a loamy soil—from a peaty soil to all or any other soils—from clay to sand, and *vice-versâ*. In the majority of cases, a change is good on every soil, and under every variation of climate. I have derived benefit from changes of seed brought from a considerable distance on every side, to the extent of hundreds of miles, but it was from seed on which I could depend. My favourite change is from a cold chalky district to a mild loamy soil.

The principal consideration with every farmer should be fully to ascertain the adaptation of his farm to grow the two fundamental varieties of wheat —*red wheat* and *white wheat*—for which it is best adapted—or, if it will advantageously produce both under a judicious rotation. Most *wheat farms* will alternately grow good crops of fine quality of both varieties; but, on the other hand, very few farms will produce good and profitable crops of *white wheat* in long succession: its liability to degenerate and mildew is much greater than in the *red* variety. The *red wheat* is in every respect more hardy, and much more to be depended upon, on the average of soils; hence its more extended cultivation. It will generally be found advantageous, on most farms, to deviate occasionally from any practice, however well it may appear to answer. No one knows when he has reached the utmost bounds of production; hence white wheat will

* See Richardson's rural hand-book with this title, published by Orr and Co.

occasionally produce a first-rate crop on lands unsuited to its growth; and as it varies somewhat in its character from red, it forms a desirable change in the rotation. In my own practice I usually grow the most prolific varieties of red wheat, as having proved them more profitable; but I find a change, such as I now name, to be good both for my own profit and the soil it grows upon. I think if the soils are suitable, white wheat should be grown in the proportion of two crops of red to one of white.

Another consideration should be, to suit the variety to be sown to the condition and fertility of the soil. A rich soil should be sown with a short-strawed variety—a poor soil with a free-growing long-strawed sort. The season of sowing should again decide as to the variety. White wheat should not be sown late in the season, or on very rich soils. The red wheat is better adapted both for late seasons and rich soils. The straw of the red wheat takes up more silica or flinty nature from the soil than the white variety; hence that brightness on the straw of red wheat: this, of itself, is the great cause of its comparative safety from that destructive parasite, mildew—that black fungus plant so frequently found growing upon the stalks of the wheat plant, and preventing its further progress by taking all juices designed for the support of the wheat to promote its own development.

Having thus shortly given some general outlines with the view of directing to a proper choice of wheat for seed, I will now offer a remark or two upon *its preparation for seed*. It has become a settled conviction in my own mind, that *smut in wheat* is mainly derivable from the smutty particles sown along with the grain, and by which it becomes tainted or impregnated. It is also derived from or propagated by *smut* deposited in the soil from any previous crop, such as blacks in oats, &c. I have proof of this taint causing smut in more cases than one. The great thing then is, to destroy the power or influence of this smutty dust. If this can be done without injury to the grain, all the better. Much loss has often ensued from the incautious use of arsenic ("white mercury") and sulphate of copper ("blue vitriol"). The more simple the remedy, if effectual, the more desirable and the greater the necessity for its adoption. Frequent washing in clear running streams of water is effectual; strong dressing with hot lime is effectual. These are simple appliances:—swimming in a brine, made of salt-and-water, has the twofold effect and advantage of destroying the smut and floating off all impurities, seeds of weeds, &c.

There are innumerable specifics put forth for dressing seed-wheat, many of which, no doubt, are good and proper; and where any one of them has been adopted and practised with decided success, it would be bad policy to discontinue its use. My own practice is very simple, safe, and easily effected. In the evening prior to the next day's drilling, as much wheat as may be required is shot into a heap and well damped with water; it is left for a few minutes to imbibe the water, and then freely and profusely dusted over with quicklime—such dusting continued as it is repeatedly turned over. The heap is then rounded up, and left till morning, when it is put into sacks ready for drilling. Should the day prove unfavourable, the heap is spread thinly over the floor, and in this state it will keep for any indefinite period. I presume it is quite superfluous to intimate that all seed corn should be free from weeds: a good and cleanly farmer would most thoroughly repudiate the idea of sowing seeds of weeds. I, however, beg more attention to this point. Never make use of seed wheat containing other seeds. It is said that weeds prevalent in one district will not grow in another: don't try it. I know that the pernicious weed called "Goldings" or "Gules" has been thus introduced into a district where, till lately, it was unknown. Weeds will become habituated to any soil; therefore avoid them as you would a pestilence. If, by some unforeseen or accidental cause, a farmer be induced to make choice of a sample of wheat containing seeds, he should use every means to clean it. This may be pretty nearly effected by winnowing or reeing, or by the use of a flannel screen, or finally by swimming in strong briny mixture.

"SPEED THE PLOUGH."

The above familiar old sentiment was somewhat happily handled by the ex-Chancellor of the Exchequer the other week, at the dinner of the Royal Bucks Agricultural Association, at Aylesbury. From time immemorial it has been the favourite toast of the farmer, has been sung by poets, played by musicians, and danced by nations in every past age, with all the glee of happier times than merry England now enjoys; but the day is fast approaching, it appears—indeed, may already be seen "looming in the distance"—when the farmer who says "Speed the plough," will be reckoned almost as old-fashioned as those who would now cry "*Success to a jarvey*"—our readers will not misunderstand us. That harmless sort of conspiracy, so to speak, which has so long been waging against the plough, has at length broken out into open rebellion; for, while the Celestial Empire experiences all the horrors of civil war within herself, and Russia and Turkey, bristled in arms, frown across the Danube in religious fanaticism, keeping the rest of the old world

in a state of political combustion, as it were, England has just joined hands with the new world to put down the farmer's best friend! In plain Irish, "*the plough is doomed*" (?)

Our text, however, comprehends something more than the mere operation of ploughing; for it also embraces the whole work of cultivation, including harrowing, grubbing, scarifying, rolling, hoeing, &c.; and the observations of the Hon. Member for Bucks were doubtless occasioned by and had reference to the efforts of Usher, Brown, Samuelson, Romaine, and others, to supersede the plough, coupled with the announcement of Mr. Mechi in the *Times* newspaper, as quoted into the *Mark Lane Express* of August 29, relative to "the doom of the plough."

Speed the plough involves the theory of a journey or race. All journeys have a starting point, although some, it is said, have no end; and among which may be set down the cultivation of the soil, or the progress of the plough. "When Adam delved and Eve span," it was doubtless all spade husbandry—a theory which has met with many supporters in the world; but since first introduced, many a change has taken place in agriculture: many an up and down in this, the parent of all arts: many an advance in the progress of chemical and mechanical science, as applied to the cultivation of the soil, so as to procure from it the daily necessaries of life in the greatest abundance, which places such a theory in jeopardy, as we soon shall see.

"*Cain was a tiller of the ground:*" such is the simple but beautiful and comprehensive language of sacred writ. The eye can almost yet look back over the wreck of ages, and even of the earth itself (by the Deluge), and behold the first farmer breaking from the arm of some stately tree a branch, or pulling up a sapling by the roots, and commencing to break up the surface of the earth and cover in the seed, exemplifying the rudiments of many a subsequent practice.

Of the antediluvian plough, and the progress of agriculture before the Flood, nothing is known; certain it is, however, that considerable progress must have been made in mechanical science before Noah could have finished such a building as the ark; and the probability is, that he preserved his plough, along with other useful implements, from the destruction of the old world; for we are told that as soon as he descended into the plains of Ararat, he became a husbandman, teaching and establishing, we have every reason to believe, all the useful arts of the antediluvian world among his offsprings.

The first age of the postdiluvian world, however, was against the plough, and in favour of the pastoral system—a conclusion amply corroborated by sacred history. Subsequent progress experienced a second and probably severer check from the dispersion at Babel. After this, speed the plough becomes a more interesting and less interrupted question; and it is very remarkable to contemplate the progress and identity of ideas among the different nations of the world, influenced in every case by the condition of the people, climate, soil, and kind of crops cultivated.

In Asia, for instance, little progress has been made since the days of Solomon; indeed, things in not a few cases have rather gone in the opposite direction—the plough sharing in the fate of empires. In proof of which, we may mention that the native plough of Hindostan, as exhibited in Hyde Park in 1851, is, perhaps, a ruder implement than that in use three thousand years ago; and in Persia and Turkey it is scarcely a more efficient article. In China, a different practice prevails: there things are more of a primitive character, the greater part of the soil being cultivated by manual labour with hoes, ideas being the same in farming as in gardening. This has been supposed to be the antediluvian system—the system of Noah, being introduced by him; but the hypothesis has scarcely even a foot to stand upon; for the more patriarchal idea is, that Noah retired back with Japheth to the plains of Ararat, where he first farmed, and there established the ancient princedoms of Ararat, in one of the most fertile and salubrious climates in the world, where the wheel-plough is to be found at work; but be this as it may, the stationary and exceptionable character of agriculture in the Celestial Empire, and over the whole of the East generally, is a very interesting circumstance in the political economy of the world.

In Egypt, the plough has been partly, or nearly wholly, superseded by the irrigation of the Nile, involving another equally interesting theory of culture as that of China; while on the banks of the Euphrates, Tigris, Indus, Ganges, and many other rivers of the East, a practice intermediate between that of Egypt and China prevailed, and still prevails, irrigation being as essential to the growth of all the cereals as ploughing, hoeing, or breaking the surface of the soil with any of the rude implements in use, so as to get a covering for the seed.

It is in Europe where the plough has made the greatest progress; and of her different kingdoms, England of late years has taken the lead. It is only, however, recently that we can boast thus far; for prior to this, we were indebted to the continent for many of our improvements, and the date of the introduction of the "Norwegian harrow"—the parent of all our rotary forkers, &c.—is but of yesterday.

For long the English plough was a very rude implement, with only one handle, bearing a close resemblance in construction to that of oriental climes. The object being the same, and the soil similar, ideas appear also to have been analogous, giving birth to identity of mechanism. Whether the Highland *caschrom* or Irish *loi* was the first instrument of culture in the world, is a question on which our Celtic populations are as yet divided. The former, it is said, was first fashioned after the likeness of Cain's right foot (?), and that his posterity have never since been able to improve upon it; and that the latter is an improvement by St. Patrick on the sharp-pointed branch with which Cain first broke the virgin soil of Mother Earth. Very original both! That agriculture was introduced into Britain long before the arrival of the Romans, is a fact which they themselves were eye-witness to. At

that time the warlike clans were masters of the war chariot, and had even improved upon the design of that of ancient Troy, if behind in point of mechanism; and although they in general hated the peaceful cultivation of the soil, yet there were always exceptions among them, so that there cannot be a doubt but the implements of agriculture, as well as those of war, were copied, if not actually brought, from Galatia, in Asia, or the Celtic regions of the continent of Europe, between both of which and Britain there was always kept up a continual intercourse, not only by the Druids and Bards, but by the common people themselves. This, however, is no argument against the priority of the *caschrom* and *loi;* for all the nations adjoining the Celtic tribes, from Asia to Britain, cultivated the soil with hand implements, as well as those drawn by oxen; so that there is no absurdity, or even difficulty, in tracing them hypothetically from the shores of England to Ararat, and onwards retrospectively to the days of Cain. Their antiquity cannot be questioned; such, at least, is fact; and their existence at the present day forms an interesting feature in the progress of the plough.

The application of two handles and a wooden mould-board must have been experienced a great improvement. Ploughs, with wooden mould-boards, may yet be seen, to the shame of more than one province in the kingdom. Of late, improvements have followed each other so fast as to render enumeration almost impossible—the curvature of the mould-board, the lines of traction and resistance, and the angles which they make, all forming very nice mathematical questions in theory, such as can only be determined in practice by the impartial index of the dynamometer.

Lastly, we come to the steam plough, in whose favour practice has as yet declined to pronounce her award; but how soon invention may give birth to the long wished-for desideratum, is the grand question at issue: the most that can be said at present is, that expectations run high. But for the exorbitant charges of the Patent Office, many more attempts would have been made than have been made, with at least the possibility, if not the probability, of success, long before now. Were it possible to put the mother country to shame—relative to the unprincipled treatment she bestows upon her inventors, and the obstacles thus thrown in the way of speed the plough—Canada has lately taken steps in the case of Mr. Romaine, which ought to do so. When men of chemical and mechanical talent, in these days of strikes, emigration, and advance of wages, have to beg advances of colonial governments, in order to uphold the antiquated exorbitancy of the Patent Office of the mother country, it is surely time for Parliament to take such steps as in its wisdom it may think fit, to remove such a burden from the former, and such a disgrace from the latter, to say nothing of the national loss sustained. Perhaps some of our readers may say we are digressing roughly; but, if so, it is all in favour of speed the plough. Prejudice is just as deep-rooted in governments, and as much against progress, as it is in old-school farmers; and the exodus may yet effect what logic has hitherto failed to do in either case.

In this hasty ramble over the long journey of the plough, we have omitted to notice the many auxiliaries which its shortcomings have given birth to, such as harrows (rectilinear and rotary), horse-hoes, rollers, clod-crushers, pressers, &c. &c.

The plough cannot, in its present form, be considered a perfect cultivator of the soil; for experiments have over and over again proved that land cultivated by the spade or fork have produced not only an increase of produce sufficient to cover the extra expense, but also to leave a profit to the farmer of more than the rent. The cause of this difference of produce may be practically stated as the difference in the effect produced by the two implements; the different state in which they leave the soil—the spade or fork loosening, inverting, and aërating it better than the plough. Land, when loosened, occupies more space than previously: in other words, the newly-ploughed land is higher than the unploughed; and before the plough can elevate the furrows thus, it has to squeeze and compress them laterally with the mould board. Land newly ploughed is often compressed so as to carry the foot; while in that dug with the spade or fork you sink over the mouths of the shoes, and your horse to the knees, at every step—the plough, in short, is too much the brick-maker. A good ploughman may cut up the furrows square, laying them straight and regular, so as to please the eye of the casual observer; but the roots of our cultivated plants love a well-pulverized soil, let its outward appearance be what it may, and accomplished anyhow.

The abridgement of labour, which has been effected by scarifiers, rotary forkers, and clod-crushers, in the preparation of land for green crops, is great, and point out in the most convincing manner the shortcomings of the plough; for once over the ground with them is better than fifty cross-ploughings, harrowings, and rolling, on the old plan. With such machines as the former, turnips are now successfully grown on lands which never could have yielded them under the latter practice.

But with all these advantages in favour of our new-fangled things, and against our old friend the plough, greater progress must be made in the former than has yet been done, before the latter can be dispensed with; for neither rectilinear nor rotary harrows—or, to adopt our new-style nomenclature, neither scarifiers nor rotary forkers—can cover-in manure, stubble, or the sward of grass lands. The liquid manure theory may set aside the objection so far as manure is concerned; but to leave stubble, roots, and the like, exposed upon the surface, can never be considered good farming: and, moreover, conceding, for the sake of argument, that there were no stubble or the like to cover, and that manure was applied in a liquid form, the mere stirring and loosening of the soil is not enough to effect proper cultivation, although some appear willing to arrive at such a theory; for the bottom soil requires to be brought to the surface, in order to experience the full action of

the sun, atmosphere, and frost. The works of disintegration and oxidation cannot be so successfully carried on under-ground as upon its surface; and besides general demands of this kind, many soils are infested with poisonous salts, such as the protoxide of iron; which, when brought to the surface, is soon changed into the peroxide—a harmless salt. In cases of this kind, a single season upon the surface will effect more than a lifetime below it: and besides such, lime, so essential to SOME soils, has a tendency to sink, and unless brought to the surface, would soon be lost sight of. Hence the conclusion.

Rotary action brings more of the bottom soil to the surface than rectilinear, so that Samuelson's digging machine is better than Finlayson's harrow, in this sense, in fallowing. Sometimes, however, after the bottom soil has been brought to the surface and there pulverized with the winter's frost, it is desirable to keep it upon the surface for the growth of turnips, and yet the bottom must be properly stirred, broken, and aërated, for which rectilinear action is better than rotary: in short, both machines are required for fallows, and neither is fit for cultivating lands for cropping, when it contains undecomposed vegetable matter, as the roots of grass, turnips, &c. &c.

From these cursory observations it will readily be perceived that considerable progress has yet to be made in the mechanical world before the plough, with all its imperfections, can be entirely superseded: much has already been done to abridge its labours, and doubtless much farther progress can be made in this direction; but the demands of practice are many, requiring more than what rotary or rectilinear forking can accomplish. As yet, spade husbandry is the most perfect system of culture, procuring more abundant crops than any other, when properly executed. It is that which has been adopted by gardeners, and rudely carried out with the hoe by the farmers of China; it is one, however, which the *exodus* will soon render impracticable to the farmers of England, unless performed by horse-power or steam—hence the *animus* of the day. We have seen that delving was the first system; that it was superseded by the plough, not because the latter performed the work of cultivation better, but because it removed the yoke from man's shoulder to that of his ox or horse; that the imperfections of the plough gave rise to numerous auxiliaries, for the purpose of carrying out successfully the delving theory; and that the grand object now is to remove the yoke from the shoulder of the horse to that of steam power, and farther abridge the labours of cultivation.

RUTLAND PLOUGHING MEETING.

This meeting, which came off at Oakham on the 6th Sept., was attended by a large company, including most of the leading agriculturists in the neighbourhood. The ploughing commenced at ten o'clock. Class 1: The Farmers' Sons, 21 competitors, upon land occupied by Robert Hawley, Esq. Class 2: Ploughmen of Rutland, 44 competitors, upon land occupied by Clark Morris, Esq. Class 3: Ploughboys of Rutland, under twenty-one years of age, 22 competitors, upon land occupied by Mr. Crowson. Class 4: Ploughboys of Rutland, under eighteen years of age, 16 competitors, upon land occupied by Mr. Ratcliffe. When it is considered that the competition was confined to the county, and that none were permitted to compete who had previously obtained a prize, except as boys under 17 years of age, this was the largest meeting ever held, there being 17 more entries than last year at Uppingham, under similar restrictions.

THE JUDGES.—For classes 1 and 2, Mr. Kilby, of Queniborough, Leicestershire; Mr. Bromhead, of Alconbury, Hunts; Mr. Newton, of Loughton, Bucks. For classes 3 and 4, Mr. Hodgkin, Kirkby Underwood, Leicestershire; Mr. Fryer, Pickwell, Leicestershire; Mr. Garner, Stapleford, Leicestershire. The gentlemen who assisted in starting the ploughs, two in each class, were hospitably entertained at breakfast by Clark Morris, Esq.

THE DINNER.—At three o'clock, about 120 gentlemen sat down to an excellent dinner in the Agricultural Hall, provided by Mr. Brown, of the George Inn. The Viscount Camden presided, supported on the right by the Hon. H. Noel and H. Hough, Esq.; and on the left by Monsieur H. Alamargot, from Bordeaux, France, and W. Sharrard, Esq. R. W. Baker, Esq., took the head of the table on the right of the chairman, and Robert Hawley, Esq., that on the left.

After the usual loyal toasts,

The Noble CHAIRMAN gave "Success and Prosperity to the Rutland Ploughing Meeting," and expressed the great gratification he had experienced in the day's proceedings, notwithstanding the unpropitious state of the weather. There had been no lack of exertion on the part of the ploughmen and boys, and, judging from the numerous company of gentlemen in the field, as well as at the dinner, he had no doubt the meeting had given others as much gratification as himself (loud cheers). In giving this toast, he (the noble chairman) said it would be an omission on his part if a strong allusion were not made to the able, zealous, and indefatigable manner in which the business had been carried on for more than a quarter of a century by one who never failed to stand foremost in the ranks of agriculturists, and who, he sincerely hoped would be able to carry it on for another quarter of a century (laughter). Not only had the little county of Rutland derived the benefit from his unwearied exertions, but the country generally; and if that debt of gratitude were not alluded to in connection with this toast, it would not merely be an omission, but a disappointment to those present and to those absent, who knew how to place a proper value upon such a truly worthy and sincere man to their interests. It was only a month ago that a casual observation was made to him by an intimate friend of his (the noble chairman's), who was not in any way connected with this county, or had any interest whatever at stake in it, but who was capable of giving a sound and practical opinion on such matters, that in the county of Rutland he saw more rapid improvement in farming than in almost any county, and a higher state of cultivation, and more particularly in that locality which came under that gentleman's (Mr. Baker's) more immediate direction. This was perfectly in

accordance with his own opinion—(Hear, hear)—and, in conclusion, he thought that every compliment for his great improvements in agriculture that could be paid to him was justly due and properly noticed in connection with this toast (loud applause).

Mr. BAKER then read the award in the several classes, and the health of the successful candidatea was drunk and responded to.

CLASS 1. Three silver cups, given by the inhabitants of Oakham. To the farmer's son in Rutland, not in business for himself, who shall plough in the best manner a quarter of an acre of land within two hours, not less than 4½ inches deep, horses abreast, without a driver. First prize, a cup, value 10 sovereigns, to Willoughby Fowler, of Exton; second prize, a cup, value £7 10s., to Richard B. Seaton, of Manton; third prize, a cup, value 5 sovs., to James Sharp, of Ridlington. John Fryer and John Rippin were highly commended.

CLASS 2. To the ploughman of Rutland who shall plough a quarter of an acre, as in class 1, and who has never won a prize or premium at any ploughing meeting, except as a boy under 18 years of age. First prize, 5 sovs, to William Michelson, with Mr. J. Burgess, of Ridlington-park; second, 4 sovs., to William Cross, with R. W. Baker, Esq., of Cottesmore; third, 3 sovs. to George Meadows, with Mr. Hammond, of Exton; fourth, 2 sovs., to John Smith, with Mr. Bird, of Casterton; fifth, 1 sov., to Geo. Smith, with R. W. Baker, Esq., of Cottesmore; sixth, 10s., to Thomas Smith, with the Rev. C. Ellicott, of Whitwell; seventh, 5s., to John Chamberlain, with Mr. J. Christian, of Barrow.

The silver cup, value 5 sovs, given by J. Talbot Clifton, Esq., to the master or mistress of the winner of the first prize in this class, was presented to Mr. J. Burgess, of Ridlington-park.

CLASS 3. To the ploughboy of Rutland, under 21 years of age, who shall plough a quarter of an acre as in class 2, and who has never won a prize or premium at any ploughing meeting except as a boy under 18 years of age. First prize, 5 sovs., to John Bellaers, with Mr. J. Woods, of Langham; second, 4 sovs., to John Glover, with Mr. Berridge, of Barrow; third, 3 sovs., to Thomas Beeson, with Mr. Rippin, of Stretton; fourth, 2 sovs., to Thomas Christian, with Mr. C. Chapman, of Exton; fifth, 1 sov., to Wm. Healey, with Mr. W. D. Humphreys, of Empingham; sixth, 10s., to Benjamin Baker, with Mr. R. L. Healey, of Hambleton; seventh, 5s., to Robert Robinson, with Mr. J. Christian, of Barrow.

CLASS 4. To the ploughboy of Rutland, under 18 years of age, who shall plough a quarter of an acre as in class 3, and who has never won a prize or premium at any ploughing meeting except as a boy under 17 years of age. First prize, 4 sovs., to John Norris, with Mr. J. G. Bosworth, of Greetham; second, 3 sovs., to Matthew Weldon, with Mr. J. Lowe, of Ryhall; third, 2 sovs., to John Kettle, with Mr. Peter Bailey, of Casterton; fourth, 1 sov. to William Perry, with Mr. Geo. Godfrey, of Greetham; fifth, 10s., to William Smith, with G. Saville, Esq., of Ingthorpe; sixth, 5s., to William Tomblin, with W. R. Morris, Esq., of North Luffenham.

WM. SHARRAD, Esq., next proposed the health of the noble Chairman, which was received with the greatest applause.

His LORDSHIP, in reply, thanked the company for the very hearty reception they had given to the toast. He assured them that he had attended at some inconvenience; but when invited to take the chair, he did not for a moment hesitate to do so, expressing the great pleasure he had in again meeting so many of his Rutland friends after an absence of nearly four years, and hoped for the future to have more frequent opportunities of coming amongst them. His lordship assured them that his family had always endeavoured to support the cause of agriculture; they felt that their interest was closely combined with it; and he could look back with pride to nearly a century and a half ago, from which time to the present the agricultural interest had never suffered at the hands of any member of his family, and hoped that now there was a member of the Noel family whom they acknowledged as their sincere representative. His lordship then glanced at the changes that had taken place during the last ten years—changes which he never advocated—and rejoiced that the agricultural interest was once more in a prosperous state.

The Hon. HENRY NOEL gave the Judges in Classes one and two.

Mr. KILBY acknowledged the toast in his usual eloquent and practical style. He was happy in again appearing as a judge at a Rutland Ploughing Meeting, and was equally happy to find the little county maintaining its pre-eminence in the cultivation of the soil. They (the judges) had had a difficult task in awarding the prizes to their own satisfaction, which he thought was proved by the long time they had kept his lordship and the company from dinner (laughter and loud cheers).

W. R. MORRIS, Esq., gave the Judges in Classes three and four, which was responded to by Mr. Garner.

The CHAIRMAN said—I have the highest gratification to join with you all to drink "the health of Mr. Baker, the founder and promoter of these meetings" (loud cheers). Although this was not the first toast or the second, it certainly was the important one of the day, and therefore could not be inferior to the first. He would repeat, if possible, more strongly than he had previously done, every sentiment of gratitude for all his useful endeavours in the improvement of agriculture; all present, more or less, had benefited from his great zeal, energy, and talent, and it really was wonderful to see meeting after meeting carried on over a period of twenty-six years without a single mistake, or the slightest failure. The whole company rose and cheered most heartily.

Mr. BAKER, after the cheering had subsided, rose and returned thanks. He said—My lord and gentlemen, you have said too much of me; you have valued my services too highly. I wish that it had been less, because words cannot convey to you how deeply sensible I am of such marked approbation of my conduct; but having said so much upon what I have done in various branches of husbandry, I am thrown into a wide field, and see clearly how much I have left undone ("No, no"). My various attempts have certainly met with success, but in the improvements that we are called upon to make, the resources of the soil appear to me almost without a bound; and I do think that every well-directed exertion will sooner or later meet with its reward (cheers). The time has arrived when it behoves the tenant-farmers to be more careful in making his bargain with his landlord for the safe investment of capital, and, having done that on his part, the landlord, by himself or agent, is bound to take his business by the handle, and render every possible aid in all permanent improvements — such as deep and effectual drainage, suitable buildings, and properly placed; for, depend upon it, where the landlord pays attention, and acts judiciously in such matters, the rent is considerably increased, and he, with his tenantry, are mutually benefited; for by such exertions the country at large shares in its prosperity (cheers). This meeting was a most satisfactory one, and in plough-making there was a decided improvement; and he thought that the hints given at the last two meetings had been acted upon. Here Mr. Baker entered into some very interesting details and remarks upon ploughs, which were listened to

most attentively. He then alluded to Mr. Samuelson's digging-machine, exhibited that day, and concluded a most practical speech, expressing himself in the kind and friendly manner usual to him, and sat down amid much applause; but not without due acknowledgment for the kind services of the gentlemen who had assisted him that day, and gave their names as the next toast.

Mr. WORTLEY returned thanks in very suitable terms, with some excellent remarks upon the day's business.

Mr. PICKERING proposed "The Town and Trade of Oakham, coupling with it the name of Mr Matthew Royce," alluding to their great liberality in coming forward with so large a subscription to promote the meeting (loud cheers).

Mr. M. ROYCE rose and returned thanks in a very amusing and lengthy speech, telling them how well he had been received by those whom he had called upon to subscribe; and that the trade of Oakham was in a flourishing state, which he thought they had to thank the farmers for (applause).

Mr. WORTLEY proposed the "Labouring Classes," making some useful remarks on the better condition of their cottages.

Mr. KILBY proposed the health of "The Earl of Gainsborough," president of the Rutland Agricultural Society, for which the noble CHAIRMAN returned thanks, assuring them of the great interest his lordship took in the cause of agriculture (loud cheers.)

Mr. HAWLEY gave "The Plough Makers," which was responded to by Mr. BIRD, of Casterton.

The CHAIRMAN then gave "The Royal Agricultural Society," for which Mr. BAKER returned thanks, stating that he was one of the first *twenty members* and promoters of that society.

Mr. NEWTON proposed "The Countess of Gainsborough, and the Noel family, root and branch," which Mr. HENRY NOEL responded to, at the same time reading a letter from Mr. Mechi, of Tiptree Hall, who was prevented from attending, by previous engagements (cheers), and in conclusion gave the health of Mr. Samuelson, who had exhibited his digging machine (applause).

Mr. SAMUELSON thanked them for their kindness, and made some very useful remarks and explanations of his implement, expressing his gratification of the day's proceedings—such a meeting as he had never witnessed before.

About nine o'clock this very interesting, useful, and valuable meeting came to a close, upon which we once more congratulate Mr. Baker upon his able and unequalled management. A very experienced gentleman in similar meetings, from a distant county, remarked that "it far exceeded his expectation, and was infinitely superior in every department to anything of the kind he had ever seen." We conclude our report with a correspondent's remark: "How well pleased every one seems to have been with the meeting on Thursday—in fact, the whole proceedings seem to have given the greatest satisfaction."

THE POTATO DISEASE.

SIR,—Since I last addressed you on the potato disease I have received numerous communications on the subject from different parts of England and the Continent, and have been repeatedly applied to for a full description of the changes I have proposed to introduce in the mode of cultivation now adopted, with the view of effecting the eradication of the disease. As my time will not allow me to reply separately to each of these applications, I will, with your permission, communicate the desired information through the medium of your columns. I adopt this course the more readily, inasmuch as I am satisfied that the directions I am about to convey will prove interesting, not only to the parties in question, but also to the majority of your readers.

It will be, doubtless, remembered that the changes just alluded to consist, 1st, in carefully drying the seed-potatoes; 2nd, in steeping them in a dilute solution of the sulphate of copper; 3rd, in planting them in poor, well-drained land; 4th, and lastly, in substituting for the farm-yard manure, &c., now employed, some mineral or inorganic compost.

DESICCATION OF THE TUBERS.

The apparatus employed to effect this object should consist of a large heated chamber, similar in character to the so-called "stoving-room" of a sugar-refinery, or of a long room fitted up with shelves for the reception of the roots, and heated by means of steam pipes, or stoves placed at intervals, and so arranged that a current of air can be made to pass over the tubers, which can be thus rapidly and effectually dried. The same end may be attained on a small scale by exposing the potatoes in layers on the floor of a warm room, or on a maltster's kiln; precautions being taken to turn them over occasionally until they have become sufficiently desiccated, and thus promote a free circulation of the air; but in practice it will be doubtless found preferable for some enterprising parties to undertake the drying of the roots, which may be afterwards retailed to the agriculturists, &c. Great care, however, I find, must be taken in performing the operation, otherwise the vitality of the tubers is destroyed. A long-continued exposure in a dry atmosphere, at a moderate temperature, appears to afford the best results. The latter, under any circumstances, should never much exceed 110 or 112 degrees. If the process has been well carried out, the dried roots, when rolled up in a damp cloth, or buried in the ground for a few days, will again become plump and fresh in appearance; whereas, on the other hand, if too high a temperature has been employed, they will, when thus treated, still remain comparatively hard and dry.

STEEPING OR PICKLING PROCESS.

Into a gallon of boiling water put a quarter of a pound of blue vitriol or blue stone (sulphate of copper), and stir the solution well, from time to time, with a piece of stick, until the salt is completely dissolved. When the temperature of the mixture has been so lowered by evaporation and exposure that the hand of the operator can be immersed without any inconvenience, the dried tubers should be thrown into the vessel containing the "*pickle*," in which they should be kept for one or two hours, care being taken to stir them well two or three times during that interval. After they have been removed from the cupreous solution and well drained, they should be dusted over with a little air-slaked or mild lime, and planted in the usual way. When, however, the drying process before described has not been resorted to, the tubers should be allowed to remain in the copper solution for 30 or 36 hours, and the pickle should be made of double strength.

PREPARATION OF THE MINERAL MANURES.

Mix intimately—

30 lbs. of wood-ashes,
15 lbs. of calcined bones, in fine powder,
10 lbs. of gypsum,
20 lbs. of common salt,
30 lbs. of air-slaked lime,
And 7 lbs. of nitrate of soda.

Whilst planting the potatoes, into every hole put about half an ounce of the above compost; cover the latter over with some earth, and then plant the tubers in the ordinary way. This manure may be easily prepared by any one at a very trifling cost, and may be measured out by means of a small tin cup, which, for convenience sake, should be suspended to the waist of the dibbler. On large farms, where the roots are set in drill-furrows, the compost may be more readily distributed by the manure-drill, or by hand in the usual manner. On most soils, however, a simple top-dressing of lime and salt, in the proportion of two bushels of lime to one of salt, will be doubtless found sufficient; the manure being employed at the rate of fifty or sixty bushels per acre. Where the land is rich, the admixture of cinders, coal-ashes, or shell-sand with the soil will be found decidedly beneficial.

Further observations I shall reserve for a future occasion, when I hope to be enabled to communicate the results of some extensive experiments, as I am informed that several well-known agriculturists—amongst whom is the celebrated Mr. Pusey, of Farringdon—are fully determined to carry my suggestions into practice.

I remain, sir, your obedient servant,

THORNTON J. HERAPATH.

Mansion-house, Old-park, Bristol, Oct. 1st, 1853.

IMPORTATION OF ENGLISH CATTLE INTO THE UNITED STATES.

The importations into the country have become quite frequent and important. A few years ago the taste ran in a different direction, and blood horses were all the go. Priam, Glencoe, Monarch, and horses of that stamp, were purchased in England at enormous prices—15,000 or 16,000 dollars being paid for a single animal; but a fondness for racing has diminished not only in the northern but also in the southern States, and the importation of well-hred cattle, sheep, and hogs has been pursued with more ardour. Whoever will compare our common native sheep with the improved breeds will see at once an immense difference between them, and yet the care, attention, and expense required to raise the former is no more than for those of higher grade. One is an ornament to lawns and an object of interest; the other almost a disgrace to the poorest farms. The profit which attends the raising of higher breeds is far greater, and it ever increases the pleasure derived from farming to have the stock of a superior quality. In a late celebration attended by breeders of fine sheep, it was stated that those from the United States were the purchasers in the English markets of the best animals. The influence of previous importations and of those now going on must be extensively felt in the production of fine wool in the United States, and the manufacture of excellent woollen fabrics. The vast extent of grazing land we possess in the northern and middle States makes the production of wool one of the most important objects of industry. The southern States, except on a few of the mountains, are not suited for this business. The entire coast is flat and sandy from Virginia to Texas, and from the shore to the mountain region, for the width of 100 to 200 miles. Over this extensive surface there is no pasturage for animals, which are fed on fodder and imported hay. The mountain region south of Virginia affords some pasturage, which enterprising citizens are engaged in devoting to the raising of sheep. They prefer breeds from Spain, owing to their supposed adaptedness to a warm climate. It was supposed that Illinois, which has a level lay of the land, was not suited to this purpose; but it was ascertained that sheep which had reached their growth in the eastern States advanced materially in size and weight from being introduced to rich pastures on the prairies. The wool became coarser, but it increased in quantity. This important interest is now under full way in most of the States which are adapted to the purpose, and it will make a great impression upon the prosperity of the country. It is, however, in the breed of fine cattle that we are likely most to excel. Gentlemen having country-seats have shewn a laudable desire to import the best stock, on the principle that a few good animals in a country where labour is dear, are better than numerous poor ones; and that animals of fine shape and colour are objects of interest in their lawns. The county of Westchester, especially, has become eminent for its numerous and superior breeds of imported stock. Among the earliest importations into that county were some noble cattle from Holland. They were beautiful in shape, large, and good milkers. These have been crossed with the Durham, and a breed known as Dutch and Durham is scattered over the county. Old Mr. Bathgate, who lives there, and who has been engaged in this business for half a century, speaks of them as being among the best for milking. Stock of the Alderney, Ayrshire, and Devon breeds have been imported by other gentlemen; but importations of the Durham have been most numerous, and, where the pasturage is good, they are considered the best stock, not only for the dairy, but also for the shambles. Col. Morris, the President of the State Agricultural Society, who resides there, has been very active in the business of importing good stock into the country. His sales of cattle have attracted a great concourse of people, and large prices have been paid. It would, no doubt, very much advance the interest which gentlemen feel in this subject if annual sales were made of improved stock, at some convenient locality near the city, open for all sellers. They need some mode of disposing of choice animals which will attract competition, and enable them to dispose of their surplus stock without disadvantage. In England, the most useful of the nobility have for years been engaged in attempts to improve the breed of cattle, in which a degree of perfection has been reached which can hardly be excelled. They look upon fine stock as the best ornaments of their grounds. Many citizens of public spirit in the United States have imitated this excellent example, and conferred very great benefit upon the country by their intelligence and zeal in this service. The cattle show at Saratoga, connected with the great fair to commence on the 20th of September, will, no doubt, be far superior to any ever before held in this country. In advance of the assemblage, the Agricultural Society have laid down certain tests by which the prizes will be awarded, which we take pleasure in publishing, for the information they convey with respect to the breeds of imported animals.—New York Journal of Commerce.

OUR FOOD PROSPECTS.—1847 AND 1853.

A deficiency in the harvest, both at home and at least in some of the continental countries, is a fact which no one will question. In Great Britain, France, and the countries bordering on the Mediterranean, the crops are less or more defective. But the more we investigate the real state of the case, the more we arrive at the conclusion that the recent panic in the corn markets in the West of Europe is exaggerated and is not justified by facts. Already a very great rise of price has taken place; and the most extravagant opinions are industriously circulated of further and very extensive rises. If there be a scarcity, it is for the interest of all that it should be known at the earliest moment, and that prices should rise to the point indicated by the degree of deficiency. The sooner the rise of price, the sooner will all the natural modifiers of scarcity come into active operation—the sooner will consumption be economised—the sooner will new supplies be stimulated from distant and remote markets. And, therefore, it is clearly not the interest of the country that the fact of a scarcity should be suppressed, or that its extent should be under-estimated. At the same time the operations of the corn trade necessarily extend over a long period—transactions originating by an order to-day, which involves a specific responsibility upon the importer, entails the risk of several months, and it will depend upon the prices in March, April, or May next whether they are attended with profit or loss. They are, moreover, in such a year as the present upon so huge a scale, that any serious disappointment to those immediately concerned involves many others in ruin, and has not unfrequently led to grave monetary and commercial crises. It is, therefore, of the greatest importance that we should form as just an estimate of the occasion as it is possible to arrive at, and that all the elements which are likely to affect the question should be brought forward as prominently as possible.

Let us refer to what happened in 1846-47, the last period of any considerable scarcity. We think that it will not be doubted that the circumstances of that period were much more serious than those of the present time, so far as regards the deficiency of food. In France, in addition to a worse crop of grain, there was almost a total failure of the potato. In Belgium, Holland, and the Rhenish Provinces the grain crops were much worse than in the present year, while the potato crop was almost a total loss. In England and Scotland the grain crops of 1846 were not worse, in some districts perhaps better, than those of the present year, but the potato crop was infinitely and incomparably worse. But the great difference between the two periods, and in favour of the present time, is the state of the case as regards Ireland. In Ireland, in 1846-47, the deficiency amounted to actual famine, and that told upon the markets of the world the more severely, from the fact that the Government interposed with a sum of nearly ten millions sterling to save the people from starvation, the greater part of which acted directly upon the foreign grain markets. In the present year the crops of all kinds in Ireland are so good that they will rather have a considerable surplus to spare than require any assistance from abroad. On the whole, then, we cannot but regard the present year as less formidable both at home and on the Continent than 1846-47.

Well, what happened in that year? At the beginning of August, 1846, the average price of wheat was 47s. 5d. the qr.; by the end of September it rose to 53s. 1d.; in October to 61s.; in November it fell to 59s.; in December it again rose to 61s. 6d.; in January to 74s. 11d.; in March to 77s.; in April it fell to 75s. 10d.; and in May the average price reached 102s. 5d., the highest price since July, 1817. In June the price fell to 91s. 4d.; in July to 77s. 3d.; in October to 60s. 4d.; and in September to 49s. 6d., having been a fall in less than *four months* of 52s. 11d. a qr. The stocks both of wheat and flour in the warehouses in this country and in France were enormous, and the ruin which then followed to the holders was the commencement and the main cause of the commercial embarrassment which was so severely experienced at that period. And all this took place in spite of the public funds of England being employed to assist Ireland to the extent of about £10,000,000, and those of France to an amount unknown, but very great. But then it may be said that there are now political reasons which did not exist in 1847, and which may greatly tend to aggravate the actual deficiency:—that a very large portion of our imports are derived from Russia, North and South, which in the event of a war may be entirely cut off. On the other hand it may be contended, that the United States are in a condition to supply us with more grain than at any former time. These are two points of intense interest at the present time, and with regard to which we propose shortly to consider the facts, so far as they are known, which are calculated to throw any light upon them.

First, then, as regards the importance of Russia as a source of supply. In considering this point we will take it for granted, for the sake of argument, that we are at war: we will take the case at the worst. Let us, then, first see what proportion of the entire supplies of wheat has been of late years supplied from Russia, including both the Baltic and the Black Seas. The comparison stands thus:—

	Wheat and Flour Supplied by Russia.		Entire Supply of Wheat and Flour.
	Quarters.		Quarters.
1846.....	204,850	..	3,344,142
1847.....	850,587	..	4,464,757
1848.....	523,138	..	3,082,231
1849.....	597,556	..	4,835,280
1850.....	638,614	..	4,830,263
1851.....	No return	..	4,812,000
1852.....	733,571	..	3,960,000

Thus we find that in no single year have the supplies from Russia been equal to 20 per cent. of the entire quantity imported. But even in the event of a war, are there any good reasons for supposing that much less than usual would be imported with prices at their present rate? In the first place, the Russian ports would still be open to neutral ships. In the next place, a large portion of the best wheat now shipped from Odessa would, in the case of need, find its way to the German frontier, or to Danzig. During the last war in which Russia and Turkey were engaged, the wool usually shipped at Odessa was conveyed in waggons to Germany, and came down the Rhine and was shipped to this country from Rotterdam. During the Danish blockade several cargoes of wheat were conveyed by land, partly by railway, to the Rhine, and thence to England, though the price was moderate at the time. Now, as compared with any former period, the means of transport are so much increased, both by railway and by steam navi-

gation, that, supposing prices to continue high, there is reason to believe that much Russian produce would reach this country, though every Russian port were hermetically sealed. Even then, in the event of war, which it is hoped may yet be avoided, we do not anticipate much, if any, diminution in the entire supply from Russia. On the contrary, if the price of wheat remains as high as it now is in Western Europe, there are good grounds for expecting that a larger supply will be furnished by Russia than in any former year; but then a considerable portion of it will be required for the Mediterranean.

In 1847 the United States supplied us with 1,834,142 qrs. of wheat and flour, out of an entire import of 4,464,757 qrs. In no country in the world have the means of supply increased in so remarkable a way, in the interval that has elapsed since 1847, as in the Western States of the Union and in Upper Canada; and if high prices continue, it is certain that the supplies from those quarters will greatly exceed anything we have yet seen or anticipated. Since 1847 upwards of 12,000,000 acres of land have been sold by the Federal Government and public bodies to new cultivators. Emigrants from Europe to the number of about 1,500,000 have arrived, and a great proportion are engaged in tilling the soil. On all hands it is agreed that the crops in the United States are unusually good, and more particularly so in great wheat districts which border on the Western Lakes.

In 1847 the chief difficulty experienced in the supply of the foreign demand consisted in the expense and insufficiency of internal transport. The Erie Canal in the north, and the Mississippi in the south, were the only two means of communication with the shipping ports. Since then the most remarkable development of internal traffic has taken place. The former means proved entirely inadequate for the traffic that was required, and besides the enormous cost which this state of things caused, the delay in some cases, and the impossibility of obtaining transport in others, added greatly to the difficulty of furnishing supplies from those parts of the Union, and absorbed so much of the price, high as it was, as to lessen the inducement of the farmers to forward their stocks. Now, all this is changed. In speaking of the comparative means of transport in 1847 at this time, the *United States Economist* says:—"Between the western waters and the Atlantic has, since 1847, been opened the northern line of railroads; the New York Central line made free for freight; the Erie railroad connecting the latter at Dunkirk, and with the western roads; the Pennsylvania line and the Baltimore and Ohio road prolonged to Wheeling on the Ohio, making, with the Erie Canal, seven avenues instead of one. In 1847 the only great work which fed the Lakes was the Ohio Canal at Cleveland. Since the several works traversing Ohio have been opened, the Indian Canal, connecting Lake Erie with the Ohio, through a fertile district, has been completed. The two great railroads traversing Michigan are now in operation..... At Chicago the Illinois Canal and several roads traversing rich districts convey vast quantities, and the whole of the Lake tonnage has greatly increased the transportation."

With such increased facilities, which, it will be observed, apply chiefly to the great wheat-producing districts, it is certain that, with the present prices, every bushel of grain that can be spared will be sent to the Atlantic ports for shipment, and which will receive no insignificant accession by the large quantity of wheat now produced in Upper Canada.

In 1847 also, or at least at one period of that year, the shipment of wheat and flour from the United States was impeded by the want of shipping. Since then, however, the increase on their own tonnage has been so great, that those best able to form an opinion on the subject think that, altogether independent of the shipping of this country, they will be able to furnish tonnage of their own sufficient for the grain trade which may arise. In 1845 the shipping of the United States was 2,400,000 tons; at the close of the last year it had increased to 4,100,000 tons.

In the event, then, of high prices continuing we must be prepared to see very large supplies from the United States. The present prices, though high, are not yet so extravagant as they were in 1847, when, if more moderation had existed, and a more temperate estimate of the real deficiency on the one hand, and of the means of supply on the other, much of the mischief which followed might have been obviated. In the present year, if a careful survey of the whole question be taken, we believe that it will be found that the real deficiency is not near so great, one way and another, as in 1846-47, and that the means and facilities of making good the deficiency, whatever it may be, are greater than in 1847, or at any former period whatever. And it is sincerely to be hoped that the public interest, as well as those of the individuals immediately engaged, will not suffer from a repetition of the wild and extravagant speculations which took place in that year.—Economist.

REAPING MACHINES.

SIR,—I will feel much obliged if in the columns of your valuable journal you can find space for a few remarks I wish to make on that much-agitated question, reaping. I desire it to be understood that I have no interest, direct or indirect, in crying up one or any of the practices in use. But as I have had considerable experience in them all, and more especially that of the sickle, I trust that in giving the results of my experience for the inspection of any who have not had such favourable means of informing themselves, I shall be fully exonerated from any charge of presumption I might seem guilty of. Indeed, after the communication of your "Old Correspondent" of last week, a letter containing practical facts will not seem either so very inopportune or uncalled for, as it might otherwise have done. Therefore, without any more comment or preface, I will at once proceed to give, not "loose statements," but facts practically ascertained, knowing well that—

> "They are chiels that winna ding,
> And canna be disputed."

To cut with the sickle a crop of oats such as spoken of last week, viz., "nearly 80 bushels an acre" would require five good reapers one day of nine hours. To cut as "low and as level" as the reaping machine, it would take one hand more We assume, however, that five cuts it, the cost would be as follows:—

	s.	d.
5 reapers at 2s. 6d. per day.....	12	6
1 binder at 2s. 6d.	2	6
Horse-raking	0	4
Per acre.....	15	4
Mowing with the scythe would cost per acre..	3	0
Taking up and binding	4	6
Stooking and raking	1	4
Per acre.....	8	10

M'Cormick's reaper would, with one pair of horses, attended by two active men, cut of the same crop and in the same time nine acres. Cost as under:—

	£	s.	d.
2 men raking off and driving alternately	0	6	0
8 ditto taking up and binding.....	1	0	0
3 ditto stooking	0	7	6
4 boys or girls making bands.....	0	2	0
Horse-raking	0	3	0
1 pair of horses	0	5	0
	2	3	6

Or 4s. 10d. per acre.

I do not for one moment pretend to be so deeply initiated in the mystery of pounds, shillings, and pence as our friend, "your old correspondent," and his veterans of the "old school," yet I am glad that I have got as much arithmetic as enables me to see by the foregoing statement that the balance in favour of the reaper, when compared with the sickle, is fully 9s. per acre.

But it may be asked, why be at the expense of a reaper to cut your crops at 4s. 10d., when the farmers of Durham can cut by hand for 5s.? Now I do not pretend to know what either the crops or the prices given for cutting them in Durham county are this harvest; but I have it, and that upon good authority, that crops of considerable less magnitude than that which was last week held up to our wondering gaze as cut for 7s., cost last harvest for cutting and binding 15s. an acre. And it is a fact notorious to all, that since that period the value of labour has undergone no diminution. Indeed, from any point of view in which I can see the statements of your correspondent, held up though they were as facts, and supported by all the flourish of rhetoric, I am inclined to believe that, versed as he may be in £ s. d., he has erred in his calculation of bushels and acres.

I am, Mr. Editor, your very obedient servant,

A Friend to Agriculture.

THE WHEAT TRADE.—No. III.

Dear Sir,—Since my letter of the 14th ult., a variety of circumstances of great moment to this trade have occurred, both at home and abroad. And first at home: after a fair but late and rather protracted harvest, it is found that the crop of wheat is not only deficient in regard to its breadth, but also in respect both to its yield and quality. All these defects arise from the same cause, namely, the excessive falls of rain during the four months from August to November of last year. This not only prevented a large breadth of wheat from being sown at all, but also unfitted the land for bearing a full crop of wheat, by draining away a large portion of the soluble salts necessary for the support of the plants, and particularly for the perfecting of the kernel. This will be better understood, if I refer to an observation of Mr. Mechi last year, in which, in speaking of the ill effect of placing dunghills in open ground instead of under shelter, he stated that, having once done this in a field that was thorough drained, the dunghill, as it became saturated with the rains, lost its ammonia, and other valuable portions, which were filtered off in such quantities by the drains, that the water of a river into which they emptied themselves was so tainted for a mile down the stream, as to be unusable by his tenants residing on its bank, *at that distance from the field.*

This result I foresaw in the month of November last, and referred to it in the "Dublin Advocate" newspaper, at the same time warning the farmers that, unless they top-dressed their wheats in the spring, they stood a fair chance of having a deficient crop. The result of this harvest proves the truth of my theory; although it was objected at the time by an eminent chymist, that the rains would deposit as much of ammoniacal and other salts, as they took away. I am quite aware that rain water contains these salts; but I also believe that excessive rains contain a less proportion than gentle showers, and that so far from excessive rains depositing a proportionate quantity of soluble salts, they carry off what are already in the land, without any adequate compensation. It is seldom indeed that we have such a fall of rain as that in November last, which amounted to $7\frac{1}{4}$ inches in the month.

It must be borne in mind too that, under ordinary circumstances, the wheat plant is *never inactive when the temperature of the soil is above 32 deg. of Fahrenheit*, although it may be a hard frost on the surface. The root continues to "gather" or tiller, even when covered with snow (as every farmer knows), which in fact forms a protecting cover from the effects of the frost. But if the land be sodden with water, as was the case last autumn, although there will probably be pleuty of straw, because the conditions of the soil in regard to its production are not injured, there must of necessity be an exhaustion of the essential elements required to form the grain, these having been carried off by the excessive falls of rain. It was from these causes, and for these reasons that I looked for a deficient produce of wheat this harvest; and I am sorry to add that my expectations have not been disappointed.

I understand that the deficiency in produce is estimated at one quarter per acre, or two-sevenths of the usual average: if to this we add the deficiency in the breadth sown, which is reckoned, I think, at one-fifth; and, again, estimate the entire average growth of the United Kingdom at 16,000,000 qrs, we shall come at the following results:—16,000,000 qrs., at $3\frac{1}{2}$ qrs. per acre, will require 4,571,428 acres; one-fifth of which is 914,285 acres; 914,285 acres, at $3\frac{1}{2}$ qrs. per acre, is nearly equal to 3,200,000 qrs.—the deficiency in corn, on account of deficiency in breadth. Again, if we deduct the deficiency of 914,285 acres from the full breadth, as above, it will leave 3,657,143 acres; 3,657,143 acres, at $3\frac{1}{2}$ qrs. per acre, is equal to 12,800,000 qrs.; two-sevenths of which is 3,657,143 qrs. The aggregate deficiency, therefore, stands as follows:—

Deficiency in breadth sown, in round numbers, say,...	3,200,000 qrs.
Ditto in produce on what was sown...	3,657,143 ,,
Total	6,857,143 qrs.

If these premises be even proximately correct, and this deficiency be added to the average importation of the last four years, which amounted to nearly 5,000,000 qrs. per annum, we shall require an importation of nearly 12,000,000 qrs. between

harvests, provided the consumption does not fall off: and that it will not we have the best reason to conclude, from the fact that all the great hives of industry are fully and profitably employed, and can afford to purchase bread, even at the highest price that we can reasonably contemplate. Let us now take a view of the prospect we have of supplying this enormous deficiency:—

1st. An importation of 12,000,000 qrs. will require a continuous stream of 230,770 qrs. per week *throughout the entire year* at all our ports. Let this be borne in mind; for the mealmen were almost frightened out of their propriety a fortnight ago, by an arrival of 84,000 qrs. at this port; when, had they fully understood the position, they ought rather to have prayed for that quantity weekly. The ports of London and Liverpool, I should suppose, receive as much wheat and flour as all the other ports of England put together; yet I much question whether we shall have half-a-dozen importations to this port, this season, so large as the one referred to. But to our point: where is this 12,000,000 qrs. to come from?

My estimate—for it was but an estimate taken from the best statistics I could procure—of the exporting power of the wheat-bearing districts did not amount to more than eight millions. From the present aspect of things abroad, I am inclined to think that even that estimate is now above the mark. I adhere to the statement in the first section, that from the northern ports there will be a surplus of 2,377,683 qrs., provided a war does not intervene to cause a derangement of the trade; and it is extremely probable that the bulk of it will come to the United Kingdom, unless prices run up in France beyond ours.

In the second section, the prospect is considerably worse than when my letter was written six weeks ago. Egypt—which I reckoned to yield 550,000 qrs.—will export *none* after December, the Pasha having issued a prohibition from that period. We shall therefore obtain less than half a million from the Atlantic and Mediterranean ports, except we get it second-hand, which, looking at the necessitous state of France, Austria, and Italy, we can hardly expect.

With regard to the supply from the Black Sea, how stands the case with us? It is an established fact now, that the crop both in Southern Russia and in the Danubian Principalities is an abundant one, and that both at Odessa and Galatz the stocks have been unprecedented. But, how much of this large produce will come to England? It appears that, so much behind-hand have our merchants been hitherto in securing themselves, that out of 112 cargoes that have recently been shipped at Odessa, *only eight* were destined for England*. And again, that, in the six weeks previous to the 12th Sept., 500,000 qrs. had been shipped at the same port, of which only 33,000 were destined for England!

How is it, then, that whilst the whole continent bordering on the Mediterranean are scrambling for the wheat, whilst at Trieste, Marseilles, Leghorn, Genoa, and other ports, the merchants are sending the whole strength of their commercial marine to the Black Sea; the merchants of Britain stand looking on with their hands in their pockets, hardly moving an inch out of their usual track, as if there were any doubt whatever of a deficiency greater than we have known for a vast number of years; for not even in 1846-7 was there so small a stock of wheat in the country as at this present moment?

I have estimated the exporting power of the Black Sea ports at rather more than three millions. It may probably exceed my estimate; but on the other hand, the competitors for it are unusually numerous and active; stimulated both by their own requirements, and the certainty that, even if they import more than they want for their own consumption, such is the deficiency here, that they will be sure to reap a handsome profit upon the surplus by re-exportation.

Such is the case with the third section. Let us now turn to the United States, where, we are informed, there is a large crop, and an increased breadth sown last season. I see, by a letter in the *Times* of last Monday, from America, that in the last five years there have been sold by the federal Government 12,000,000 acres of land, most of which is cultivable; and the writer calculates, from this circumstance, that a vastly increased exporting power has accrued; and that between the excellence of the crop and the extended cultivation, there will be an unprecedented surplus wherewith to bless their needy kinsman John Bull.

Looking at the statistics of America (the United States) for the last forty or fifty years, I confess I have no great faith in Brother Jonathan's large words. I have no doubt of the fact of that quantity of land being sold, because the statement is probably taken from the Government report. But the inference drawn therefrom is hypothetical—and a bad hypothesis too. In the first place, will any one believe that this large quantity of land has actually been brought into a state of cultivation, capable of growing a crop of wheat? Or that even what has been cleared in the five years is all sown with wheat? Or that the produce has been such as to enable the growers to export a large surplus beyond their own wants?

These questions may be answered very speedily. The clearing process is a tedious one; and with the means possessed by the generality of emigrants—for they constitute the bulk of purchasers—it requires a long time, even after the timber is felled, to make the land productive. This will best appear, when we consider the average produce of wheat throughout the States, which, according to a high authority, does not exceed *eight bushels per acre!* Now, in 1840, the whole produce of wheat in all the states of the Union did not amount to nine millions of quarters: and since that period consumption has kept nearly an even pace with production. During the last five years, too, the emigration to the States has been unusually great, and every emigrant of course helped the consumption much more than the production the first three years of his advent; so that the mere fact of so large a quantity of land having been sold, will not at present help us much.

On the other hand, the American farmers have found that Indian Corn pays them much better, in the long run, than wheat, or any other grain, which is proved by the immense quantity of that cereal grown, more than of anything else. Wheat, in fact, does not constitute more than one-sixth of the cereal produce of the states, and the exports from thence to the United Kingdom have seldom reached a million quarters. I have now before me the Parliamentary returns for the three years from 1849 to 1851, and I find the following statement of wheat, and flour as wheat imported in those years:—

1849	613,601 qrs.
1850	537,030 „
1851	911,855 „

In neither of these years, then, did the quantity amount to a million quarters; and yet, free-trade having given them a permanent market, the bulk of their surplus came here.

But supposing the United States are able to export two millions of quarters this year, how will the case stand with us? Why, there also we have the French, if not some other countries of Europe, for competitors, and already they are in that market purchasing all they can lay their hands on, by agents direct from home, whilst our merchants are sending out

* See Mr. Mongredien's letter of the 23rd ult.

their orders with *a fixed maximum price*, which the return mail informs them was much below the market; and thus they are allowing the opportunity of obtaining an adequate supply slip through their fingers until they will only be able to get it at an exorbitant price. Under these untoward circumstances, with so vigorous a competition, I do not think we shall even obtain so much wheat from the states as we did last year—those ports of the continent which hitherto have been closed against the importations of grain being now opened. If we get 800,000 qrs. in wheat and flour, it will be as much, I think, as we can expect.

From Canada it is probable we shall have an increased supply. Her intimate relationship, both by blood and common interests, will give us the preponderance there, and it is not improbable that our imports from thence will equal those from their Yankee neighbours. The cultivation of the land in Canada is much more advanced than it is in the United States, generally speaking. In the latter, land is so abundant and so cheap, and labour so dear, that the farmers find it more to their advantage to cultivate a large quantity imperfectly than a small quantity well; which accounts for the small produce, as stated above. But in Canada some of our best English farmers have become settlers; and although in the first instance good English farming is of little value, yet when once the land is brought into a proper state of tillage, there is as much scope for good husbandry there as in England.

Such are my views of the present prospect in regard to the supply of wheat for this season; and, if they are correct, it is impossible to give even a proximate guess at the probable quantity we shall be able to obtain. One thing, however, is very certain—that unless our merchants bestir themselves in time, there will be an awful deficiency in stock, and enormous high prices next year. We cannot, with any degree of safety, shut our eyes to the fact of the largest deficiency in the home growth of wheat that has occurred for a long series of years; and this fact renders it imperative that a much larger importation than usual will be required. On the other hand, the competition which is already in the field against us will certainly render it difficult, if not impossible, for us, without the greatest promptitude and at still higher prices than the present, to secure enough for the year's consumption.

Hitherto, in my letters, I have made no particular allusion to Ireland, having reserved it for a parting word. I find therefore that the wheat imported into Great Britain from Ireland in thirteen years, from 1826 to 1839 inclusive, was 8,094,197 qrs., or an average of 622,630 qrs. per annum. In the following thirteen years, from 1840 to 1852, the quantity was only 3,658,159 qrs., or 281,397 qrs. per annum. And taking the three years 1849-50-51, I find them respectively 233,435, 168,746, and 90,794 qrs. This comprises wheat and wheaten flour, and exhibits a great falling off in the exporting power of that country. On the other hand, in the same three years, there have been imported into Ireland from foreign parts and from Great Britain the following respective amounts:—722,025, 976,506, and 1,302,460 qrs. The account therefore stands thus:—

Imported in three years, from 1849 to 1851.....	2,000,991 qrs.
Exported same time	492,955
Excess of imports	1,508,036

Thus Ireland, which a few years since furnished us with a liberal supply of wheat and flour, does not now grow enough for her own consumption. For this change there are several causes. One is the loss of the potato, and the famine in 1846, which habituated the population to the use of cereal food; and there has been a gradual advance since, in the consumption of bread and other cereal preparations. But another and striking cause is the *gradual decrease in the produce*, and consequently in the growth of wheat, which has been taking place for some years; so that some of the finest lands in Ireland—which a few years since grew twenty barrels per acre, of twenty stones each—will not now produce more than from six to eight barrels. This is by some ascribed to the disuse of lime as a dressing for wheat, the upper soil of a great part of Ireland containing no lime, and of course no phosphates. So impoverished were the farmers by the famine and loss of the potato, that they have not been able to do justice to the land as formerly. The chief reason, however, for the falling off in the produce of wheat, is the determined spirit for emigration which has seized the whole rural population almost *en masse*. For this they have been preparing for years, and have actually run the land out to such an extent that it will take years to recover it. I am acquainted with three Suffolk farmers, who together took a tract of land in Roscommon of about six hundred acres; it is naturally of as fine a quality as any in Ireland; but so completely was it exhausted by repeated cropping by the former occupiers, that although they have been now three or four years upon it, it is only just beginning to recover and repay them for the outlay.

It is probable, however, that the operations of the Encumbered Estates Court will produce a most beneficial change in the whole economics of the land in Ireland. Hitherto, a large portion of it has been useless in a national point of view; for so deeply was it encumbered, that neither the owner, the occupier, nor the country at large derived any benefit from it. It is now passing into other and more useful hands, who have money and spirit to make the most of it; and I confidently anticipate that, before many years, Ireland will again become an exporting country, besides growing enough cereals for a rising and thriving population.

Neither have I specially referred to the contingency of a continental war, which, even if Great Britain is not involved would at the present moment prove most calamitous to her. It would in that case be still more difficult, if not impossible, for us to obtain the adequate supplies for the season; and we might have a recurrence of the prices and scenes of 1799 and 1800. Let us hope that Providence will avert such a calamity; and in the mean time, let our merchants "make hay whilst the sun shines"; or, in other words, send out their orders and their vessels before the stocks of wheats at the various foreign ports have passed into the hands of our neighbours.

Yours truly,

London, Sept. 29. S. C.

GUANO AS A MANURE.—A correspondent of the *Aberdeen Journal* makes the following remarks on the communication to the *Times* from Mr. James Caird, Baldoon, upon the importance of the guano question: "Mr. Caird sets out by giving the result of an experiment on his own farm, where, by the application of 2 cwt. of Peruvian guano to an acre of wheat land, without any other manure being used, he obtained—

Upon the acre so dressed, 44 bushels; and of straw 40 cwt.,
On one acre not dressed, 35 bushels; and of straw, 30 cwt.

Increase in wheat, 9 bushels; and of straw, 10 cwt.

I do not advert to the mode of manuring Mr. Caird employs, further than to say that his system certainly is not that of

high farming; and he must hold under very liberal covenants. Were his practice generally adopted, of only giving 2 cwt. of guano per cwt. to all the bare fallows of the United Kingdom as manure, we should speedily require enhanced importations of wheat, flour, &c. But to return to his experiment. It is only partially given; and, referring to the cost price of the guano, £1, and the 9 bushels extra of wheat obtained, Mr. Caird says: 'I have 9 bushels of wheat for £1.' He may may have the number of bushels extra; but in order to have exhibited his experiment, from which he deduces his calculations, and upon which he builds his hypothesis, correctly, he ought to have stated the *weights per bushel* both of his dressed and unmanured acre of wheat, as it is a well-known fact that guano has the effect of enhancing the quantity and diminishing the weight of grain. Till he shows that the weights of both are the same, his premises are not proved. But further, granting that he does obtain this enhanced production, he seems to write upon the supposition that hitherto no guano has been used, and that its application, at the rate of 2 cwt. per acre, over the wheat soils of the United Kingdom, would render this country independent of foreign grain. If this be his meaning, then he is egregiously mistaken as to the amount of guano used on grain crops; and the whole system of calculation must, therefore, be incorrect, leaving out of the question the ascertained fact that on many soils guano is inoperative in effects, on some prejudicial. But to conclude. Mr. Caird apparently comes forward on this occasion as complaining of the guano monopoly, and as the champion of the agriculturists, who to a man have been crying out at its exorbitant price, which prohibits its extended application—as a proof of which, the English Agricultural Society's offer of £1,000 premium for an equally efficient manure, at £5 per ton, need only be pointed to. On this point, his letter is a perfect paradox. The guano monopoly he characterizes as a *public calamity*. All monopolies have been considered so, because they enhance prices. But here we have Mr. Caird stating that Peruvian guano, at the present price of £10 per ton, with the now price of wheat, is *amply remunerative* to the farmer; that the *limited supply* is what he has reason to complain of; and thereby showing Messrs. Gibbs that their monopoly is no hardship at all as respects price. They have only to keep up the supply, although at £10 per ton, and this public calamity vanishes! What use is there, then, for calling in State interference, discovery expeditions, and all such appliances? Will the farmers of the kingdom thank Mr. Caird for help to cheapen guano? I suspect not.

SALE OF SHORT-HORNED CATTLE AT MOYCASHEL FARM.

Yesterday the most important sale of short-horns ever held in Ireland took place at Mr. Robert Holmes's farm, Moycashel, near Kilbeggan. Mr. Holmes has long been looked up to as the most successful breeder of stock in this country. It is well known that he was one of the first, if not the very first, who imported the breed of improved short-horns from England, and, at this present moment, there is not a herd of these valuable cattle in Ireland which is not either directly descended from some of Mr. Holmes's stock, or contains a large admixture of its blood. It is not surprising, then, that the report of Mr. Holmes being about to dispose of his celebrated herd should have attracted a numerous assemblage of breeders and of gentlemen interested in the improvement of our horned cattle.

Accordingly, long before the hour named for the sale, visitors began to arrive at Moycashel, and the numbers continued to increase for several hours. Several of the well-known breeders from England and Scotland were present, beside almost every gentleman in Ireland whose name is known in connection with the improvement of our breeds of cattle. Amongst those assembled on the occasion were Mr. Rotch, of New York; and Mr. Seawright, of Kentucky.

Having partaken of an excellent *dejeuner*, the numerous visitors adjourned to an adjoining field, where the sale took place. Notwithstanding the inclemency of the weather, the bidding went on in a very spirited manner. Mr. Strafford, the auctioneer who officiated, was the same who disposed of the famous herd of the late Earl of Ducie. The prices realized at Mr. Holmes's sale, though not equal to those obtained at Tortworth, were higher than have heretofore been known in Ireland. One cow sold for 200 guineas; a two-year-old heifer brought 275 guineas, and was again sold by the purchaser for 300 guineas; a heifer calf, six months old, reached the astonishing price of 240 guineas; and a bull calf, only one month and nineteen days old, was knocked down for 60 guineas! The whole amount obtained for thirty-nine animals, including calves, was £2,583; averaging £66 4s. 7d. each.

The following list from the *Irish Farmers' Gazette*, exhibits the prices obtained for the several lots, with the names of the purchasers. We know that the minutest information which we have been enabled to obtain, will be most acceptable to our country subscribers:—

COWS.

1. Victoria 3rd—Calved in 1840, by Second Comet; purchased by Mr. Pollock, 40 guineas.
2. Victoria 4th—Calved in 1841, by Prince Albert; purchased by Mr. Topham, 57 guineas.
3. Ruth 3rd—Calved in 1844, by Sir John Sinclair; purchased by Mr. Reynell, 32 guineas.
4. Victoria 8th—Calved in 1845, by Sir John Sinclair; purchased by Mr. Carr, Settle, Yorkshire, 70 guineas.
5. Ruth 4th.—Calved 1846, by Romeo, purchased by Mr. Cruikshank, Aberdeenshire, 46 guineas.
6. Miss Jones—Calved in 1847, by Scamp; purchased by Mr. Kerney, 40 guineas.
7. Victoria 11th—Calved in 1847, by Scamp; purchased by Mr. Jones, 25 guineas.
8. Victoria 13th—Calved in 1848, by Comus; purchased by Mr. Carr, 23 guineas.
9. Red Britannia—Calved in 1849, by Comus (B.); purchased by Mr. Kearney, 36 guineas.
10. Ruth 7th—Calved in 1848, by Comus; purchased by Mr. Wade, 24 guineas.
11. Britannia 6th—Calved in May, 1848, by Comus; purchased by A. F. Nugent, Esq., 26 guineas.
12. Victoria 14th—Calved in February, 1849, by Comus (B); purchased by Harvey Combe, Esq., Surrey, 115 gs.
13. Victoria 15th—Calved in 1849, by Hamlet; purchased by Harvey Combe, Esq., 120 guineas.
14. Victoria 16th—Calved 1849, by Hamlet; purchased by Mr. Anderson, county Antrim, 200 guineas.
15. Victoria 17th—Calved in 1850, by Lord John; purchased by A. Bole, Esq., 51 guineas.
16. Victoria 18th—Calved in 1850, by Lord John; purchased by A. Bole, Esq., 47 guineas.

17. Britannia 7th—Calved in 1850, by Lord John; purchased by Mr. Cruikshank, 35 guineas.
18. Britannia 8th—Calved in 1850, by Lord John; purchased by Lord Dufferin, 47 guineas.
19. Victoria 19th—Calved in 1850, by Lord John; purchased by Mr. Cruikshank, 56 guineas.
20. Britannia 9th—Calved in 1851, by Lord John; purchased by Mr. Topham, 38 guineas.
21. Britannia 10th—Calved in 1851, by Lord John; purchased by Mr. Wade, 20 guineas.
22. Britannia 11th—Calved in 1851, by Lord John; purchased by Mr. Cruikshank, 41 guineas.
23. Victoria 20th—Calved in 1851, by Broken Horn; purchased by Mr. R. A. Alexander, 275 guineas.
24. Ruth 8th—Calved in 1851, by Lord John; purchased by A. F. Nugent, 62 guineas.
25. Ruth 9th—Calved in 1851, by Lord John; purchased by Mr. Carr, Settle, Yorkshire, 50 guineas.
26. Victoria 22nd—Calved in 1852, by Lord John; purchased by Mr. Carr, 50 guineas.
27. Victoria 23rd—Calved in 1852, by Baron Warlaby, purchased by A. F. Nugent, 80 guineas.
28. Ruth 10th—Calved in 1852, by Royal Buck; purchased by A. Bole, 91 guineas.
29. Britannia 12th—Calved in 1853, by Royal Buck; purchased by Mr. Carr, 25 guineas.
30. Victoria 24th—Calved in 1853, by Royal Buck; purchased by A. Bole, 30 guineas.
31. Victoria 25th—Calved in 1853, by Royal Buck; purchased by Mr. Ambler, 20 guineas.
32. Victoria 26th—Calf, six months old, by Baron Warlaby; purchased by J. S. Tanqueray, Esq., 270 guineas.
33. Victoria 27th—Calved, 1853, by Royal Buck; purchased by Mr. Ambler, 40 guineas.
34. Victoria 28th—Calved, 1853, by Royal Buck; purchased by Mr. Ambler, 31 guineas.

BULLS.

1. Baron Martin—Calved, 1852, by Baron Warlaby; purchased by R. A. Alexander, Esq., 150 guineas.
2. Lord St. Leonard—Calved, 1853, by Royal Buck; purchased by R. Fetherstone, Esq., 33 guineas.
3. Baron Pennefather—Calved, 1853, by Royal Buck; purchased by Mr. Little, 21 guineas.
4. Chief Baron—Calved, 1853, by Hopewell; purchased by Mr. Ambler, 32 guineas.
5. Chief Justice—Six weeks old; purchased by Mr. Ambler, 60 guineas.

The bulls, with the exception of No. 1, were deficient in colour, otherwise higher prices would have been obtained. The total sum realized by the sale amounted to £2,583.

There were a number of English and Scotch gentlemen in attendance.

—From the *Dublin Evening Mail* of Friday, Sept. 30.

SALE OF SHORTHORNS, &c., AT ABINGTON.—The well-known herd of pure-bred shorthorns, belonging to Rev. F. Thursby, was sold by auction, by Mr. Strafford, at the Rectory Farm, on Tuesday last, together with a fine collection of poultry, &c. About 600 shorthorn breeders and amateurs from all parts attended. Among the company were Sir Charles Knightley, Bart, Sir G. S. Robinson, Bart., Mr. Towneley Parker, M.P., Mr. Tanqueray, Mr. Bolden, Mr. Ambler, Mr. W. B. Stopford, Mr. Sartoris, Mr. T. T. Drake, Mr. J. Lord, Mr. W. Smyth, Mr. Beaufort, Mr. Beasley, the agents of Lord Ducie, Lord Besborough, Duke of Buccleuch, Mr. S. Majoribanks, &c.; Messrs. Robinson, of Clifton; Ladds, Clarke, all the neighbouring farmers, and many of the clergy and gentry of the surrounding villages. We subjoin a list of the prices and purchasers of the most valuable lots, from which it will be seen how highly the animals were appreciated. Several lots were sold to go abroad. The pigs and Dorking fowls were also much admired, and many of the latter realized high prices, as much as six guineas being made by a cockerell and two pullets. Cows and Heifers: Dowager Queen and calf, £40, Mr. Bolden, near Lancaster; Polyanthus, £44 2s., Lord Ducie; Nann, £25, Lord Ducie; Augusta, £40, Mr. W. B. Stopford; Gertrude, £48, Mr. Bolden; Yorkshire Lady, £34, Sir G. S. Robinson; Pineapple, £44, Mr. Wood, of Clapton; Ada, £36, Mr. Morland; Infanta, £50, Col. Cartwright; Lælia, £36, Mr. T. T. Drake; Rarity, £86, Mr. S. Majoribanks; Sunflower, £42, Mr. T. T. Drake; Bombazin, £55, Lord Ducie; Verbena, £31, Mr. Sartoris; The Abbess of Abington, £42, Mr. Sartoris; Sunshine, £42, Mr. Howell; Honey, £44, Mr. Ladds; Bright Eyes, £45, Mr. Howell; Raree Show, £63, Mr. S. Majoribanks; Prunella, £52, Mr. Sartoris; Florence, £36, Mr. Sartoris; Arnaca, £29, Mr. Ladds; Lady Hopetoun, £52, Mr. Bolden; Mrs. Bumble, £22, Lord Ducie; Lady Foppington, £35, Mr. Cartwright. Bulls: Trajan, £68, Lord Ducie; Chief Justice, £37, Lord Besborough, Ireland; Selim, £15, Lord Besborough; Quack Doctor, £53. The total produce of the sale was £2,369.

WEEVILS IN CORN-WAREHOUSES.

SIR,—Knowing your willingness to afford every advantage to your readers, in the shape of desirable knowledge on important subjects, and feeling that the above title is one that will enlist the notice and consideration of every farmer, merchant, and miller, I would, in brief, call your and their attention to it.

That weevils are a most destructive insect, doing great injury to corn, and breeding in very large numbers, are facts too well known to all who have the misfortune to have them on their premises; that they are extremely difficult to destroy, is equally well known; and it is concerning this latter fact that I would more particularly request the advice of your readers.

I have known warehouses infested with this vermin to have been thoroughly washed with gas-water, and afterwards the walls lime-washed, and the wood-work painted; but this treatment had not the desired effect. The fumes of sulphur, which will destroy most insects, have on this class little or no effect. I know an instance in which a quantity of oats, having weevils in them, were put over a kiln, and sulphur burnt under them, still they were not killed. In fact, I have not yet heard that when they have once gained an admittance where much corn is kept (except mills), they have ever been entirely exterminated. It is true that, by frequently screening and turning the corn, immense numbers are destroyed, and thereby they do not materially increase; but I should feel obliged, if through the medium of your paper, a means of *certain death* could be shown.

The insects cannot live long in mills, on account of the continual tremor to which they are exposed. The shaking caused by the motion of the machinery has the effect of throwing them on their backs, and they have great difficulty in regaining their natural position, and frequently they are unable to turn, and consequently die.

If you will, thinking the subject of sufficient importance, insert this letter in your journal, you will oblige

Yours very respectfully,

Louth, Oct. 7, 1853. WILLIAM K.

UPON THE STATE OF THE CROPS, AND THE DISEASE IN POTATOES.

SIR,—The difficulties that have attended the cultivation of land have not been surpassed in any preceding year of the present century, and now that we have arrived at the time when the result is to be tested, we feel still more inclined to be dissatisfied. It is a trying year for the heavy-land farmer, and although a few may have been compensated by the increased value of fat stock, still the number is few in comparison with the many who depend almost entirely upon the production of grain crops, and of wheat more especially; for it is now found that, in addition to the deficiency of plant, the yield is still more deficient upon the heavy clay lands, and in many cases will not realize more than one-third of an average crop; and the only resource upon such lands is the bean crop, which, although better than any other, is for the most part still in the fields, and with less favourable anticipations of the yield.

Independent of the weather, unusual phenomena have attended the season, and the result shows a growing tendency to attacks of the vegetable kingdom of a destructive and devastating character, and blight, as it is termed, increases year by year, arrives at its climax, and retrogrades gradually as it advances. This leads me to conclude that it depends upon atmospheric agency; and as I know the health of animals is arrested in the same manner, we may fairly infer that its progress depends upon the same causes, and that the atmosphere at one period differs in some essential from that of another period, and upon its affinity for combination with certain substances produced of a deleterious nature, the various effects that we find produced are referrible to some hidden and (to us at present) inexplicable sourcea.

To begin with the potato, the disease was unknown previous to 1845, and its first attack was more fatal than has been the case in any succeeding year, and as it has proceeded up to the present time, every year has been marked with some new phenomena attending its progress. Throughout the southern and midland portions of this kingdom the general appearance of the crops led us to suppose that the whole of the tubers would be destroyed; but upon digging the crop we find such is not the case: those that are not entirely destroyed are particularly sound, and although of stinted growth, leave us in a far better position than was the case in the year of the great failure.

It is now quite certain that a species of parasitic fungi invariably attends the appearance of disease; but this we now consider an *effect* rather than a *cause*, seeing that all vegetables are liable to attacks of parasites the instant they become diseased, and which are communicated to the plants in succeeding years by some inherent vitality that they possess, and upon this point I am not venturing mere conjecture, but after several years' examination of the subject am enabled to demonstrate that such is certainly the case.

Upon the first apparent attack of a vine in a hot-house under notice, examinations were carried on day by day, by the assistance of a powerful microscope, and it was found that after a few days the spores of the fungus (which consists of the white powdery substance covering the grapes) vegetated, and threw out *mycelium*, or minute fibres, over the surface of the watch glasses, upon which they were collected; and upon an examination made a few months afterwards, it was found that such vegetative faculty had extended over the whole surface of the glasses—not at random, but apparently under the influence of some faculty not possessed by other vegetables. The *spores*, as distributed upon the surface of the glass, either in small clusters or singly, were probably, at least upon an average, a thousand of their diameters apart; yet, notwithstanding, the small fibre issuing from one proceeded direct to another, and that generally the nearest, until at last the whole presented to the eye the appearance of a beautifully defined map, in which the single spores represented the site of villages; the clusters that of towns; and the mycelium, or small fibrous shoots, the roads leading from one town or village to another; and so firmly have they become attached to the glass, that upon removing them an erosion of its surface is found to have taken place, and which it is difficult to remove: this effect does not take place in the light, but in darkness proceeds in a rapid manner.

Upon examination of the diseased potato I was convinced that the whole collective tissue of the stems and leaves was penetrated in the manner before described; and, although I could not define it, the analogy was so conclusive, when compared with that of the grape, as well as that produced by the fungus destroying wood, when affected by dry rot, and in which case the mycelium is apparent to the eye. With the potato the tubers nearest the surface are generally those affected, and in this season entirely destroyed; upon such the parasites were clearly visible, and if not the cause the result of the disease. Upon fully considering the subject my opinion is now confirmed that if they are the cause, they are attached to the potato at the time of planting; and, like the spores of the smut-ball affecting wheat, if not eradicated by some solution sufficiently strong to destroy their vitality, re-produce the mischief in each succeeding year; and thus we hear that planting in peat, old oak tan, ashes, soot, and even washing the potato sets with a solution of blue vitriol in the same manner as wheat, prevents the crop being injured in the succeeding year.

It being now fully established that a particular fungus attacks the stems of the potatoes at the first appearance of disease, this rapidly proceeds downwards, and the potatoes growing nearest the surface are most subject to the disease—in this season they were entirely destroyed—whilst the remainder, in most instances, are not in the slightest degree affected; which shows that the disease is attended with different results under different circumstances, and certainly with less intensity as it advances from year to year.

Now the common smut-ball (*Uredo segetum*) in wheat is the fungus which attacks that plant, the spores of which become disseminated among the sound grains, are taken up by the plant during the process of vegetation, and are reproduced in the following year, unless the wheat has been subjected to the effect of some solution sufficiently strong to destroy them. I suggest therefore the probability of the fungus attacking the potato being produced in a similar manner; and if so, then we must seek a remedy by submitting the seed-potatoes to some process that will destroy the vitality of the fungus without injuring the vegetative property of the potato. The recent discovery reported to have been made in Germany, by drying the potato sets upon a stove, may effect the object in this way; and I am enabled to state that in two years successively potatoes, that have been subjected to the

action of the fumes arising from burning sulphur were free from disease; but in the third year, from the experiment failing, it was discontinued, as I now suspect, from the imperfect manner by which it was effected.

I throw out these suggestions for the consideration of the scientific and curious, and also as a question of great national importance. I am, Sir, yours, &c.,

Writtle, Oct. 18th, 1853. ROBT. BAKER.

EQUALIZATION OF THE PRICE OF WHEAT BY IMPROVED STORAGE.

SIR,—Political economy teaches us that the supply of all necessaries, food included, is most safely left to the operations of individual buying and selling; and that rises in prices are the salutary methods whereby people are unconsciously made to economise their consumption, and thus enable a limited supply to hold out, just as Joseph in the olden time in Egypt kept corn in hand till the years of famine had expired. But Joseph did keep corn in hand; and probably the Egyptian dry climate had much to do with its duration: possibly some of the mummy wheat of our time may have been of the identical grain hoarded by Joseph.

Our English grain is of three classes; two of which, oats and barley, are kept in the husk. Wheat is shelled out, and consequently is more exposed. The methods used to preserve it do not seem adapted to our climate, and it is not considered in the light of a permanent substance, if we may judge from the fact, that while money may be borrowed on the mortgage of pipes of brandy in the docks, the like thing does not take place with a stock of wheat in a granary. The one is considered a real property, the other ephemeral. We hear constantly of damaged wheat, but not of damaged brandy; and of all fluctuating prices those of wheat are the most uncertain. To speculate in wheat, is commonly supposed to require more shrewdness, skill, and knowledge than most other mercantile transactions, and commercial disasters in wheat are more common than in other commodities.

Why should this be? Why should an article in such universal demand be a source of peril to those dealing in it? The only apparent reason is, its perishable nature, the uncertainty of its remaining a fixed quantity in the granary that holds it. A thousand quarters may go in, good sound wheat; and in a month or two, by the operation of rats, mice, weevil, mildew, and men, may come out five hundred, and this amount reduced in value by the double operations of meting and transit thereof.

Most things connected with the storage and transit of wheat appear to be ill arranged. Home-grown wheat is tied up in sheaves and stacked—the stacks being erected on stone stilts to keep out vermin. It is usually thrashed out to send to market. If bought by the miller, it is ground up; if by the speculator, it is conveyed to a granary.

A granary is a building of better or worse construction according to locality and circumstances, and is commonly situated on the banks of a navigable stream, or in a seaport town. In most cases it is exposed to a very moist atmosphere. If of large size, the granary usually consists of many stories with wooden floors, barely sufficient for a man to stand upright, and with numerous small windows for the purpose of ventilation. The wheat is laid on the floors from eighteen inches to two feet in thickness. Previous to storing, it must have undergone the process of weighing or measuring; which has added to its cost. Transit and storing has added to this expense; and when in the granary it is frequently turned over by men with wooden shovels, to prevent mildew or fermentation by damp. This is a third source of expense. Loss by vermin, or by pilfering, is a fourth item. When sold, there is a fifth and sixth item in remeting and transit.

Wheat is heavy, and the granary must be a very strong building. Owing to the necessity of ventilation the bulk of wheat stored is only equivalent to one third or one-half the cubic contents of the building; and this again adds considerably to the dead capital employed, and on which interest has to be calculated. Another evil is, that for want of efficient granaries on a small scale in different localities, there is a tendency to the gathering together of large stocks of wheat in particular districts, which is subsequently redistributed, perhaps carried back to the original localities.

It would appear, then, that the want of efficient storage to preserve wheat permanently is one of the main causes not merely of the fluctuations in price, but of a generally much higher price than would obtain if we could make as sure of it as of a cargo of deals or coals. More persons would then embark in the trade, and there would be less tendency to make hurried sales for fear of loss. It would be a safer business for monied capitalists; the difference between harvest-time and winter prices would lessen; lucky speculations would be less numerous, but heavy losses would also lessen, and general profits would increase. It would be a far better trade for those desirous of obtaining a lower but sure profit on their capital, and the advantages to the general community of obtaining the staple article of their food with little fluctuation in price would be very great.

There does not seem to be any difficulty in the matter, if we can divest ourselves of preconceived ideas; of the notion that a granary or a grain receptacle must necessarily be a building with a floor and windows more or less multiplied in altitude. We may reason by analogy as to what is the cheapest and most effective means of securing perishable commodities from the action of the atmosphere and vermin. In England we put our flour in sacks. Brother Jonathan puts his in barrels; which does not thoroughly answer; for, through the fissures or pores, the atmosphere turns sour or musty a portion from half an inch to an inch in thickness, and sometimes the whole mass, as witness the return cargoes now coming from Australia, to do duty, mixed with cotton, in our calico manufactories, and subsequently be washed out by our housewives. If Brother Jonathan wishes really to preserve his flour or his "crackers" undamaged, he makes them thoroughly dry and cool, and hermetically seals them in tin cans. This also is a common process to prevent goods being damaged at sea. The Chinese, not having much facility for metal manufacture, line wooden chests with thin sheet-lead or tin, and pack their teas in them. In England we keep our tea and sugar in cases of tinned sheet-iron. We preserve meat in tin cases hermetically sealed. We put fruit into sealed bottles. In all these cases, the object is to exclude the air as well as vermin.

There can be no doubt that if we were to put dry wheat in an hermetically sealed tinned case, it might be kept as long as the famed "mummy-wheat" of Egypt. This will readily be admitted, but the expense would be queried.

Let us examine into this. A canister is a metallic reservoir; so is a gasometer; so is an iron water-tank in a ship, at a railway-station, or elsewhere; and a cubic foot of water-tank on a very large scale will be found to cost very much less than

a cubic foot of canister on a small scale. And if a bushel of wheat be more valuable than a bushel of water, it will clearly pay to put wheat into huge canisters of iron.

The wheat-canister, in short, should be a wrought or cast metal tank of greater or less size, according to the wants of the owner, whether for the farmer's crop or the grain-merchant's stock. This tank should be constructed of small parts connected together by screw-bolts; and, consequently, easily transported from place to place. The internal parts should be galvanized to prevent rust, and the external parts also, if desired. It should be hermetically tight at all the joints; and the only opening should be what is called a man-hole, that is to say a canister-top, where the lid goes on, large enough to admit a man. When filled with grain, the top should be put on, the fitting of the edge forming an air-tight joint. Wheat put dry into such a vessel, and without any vermin, would remain wheat for any number of years. But an additional advantage to such a reservoir would be an air-pump, by the application of which, for the purpose of exhaustion, any casual vermin would be killed. If the grain were moist, the same air pump might be used to draw a current of warm air through it to carry off the moisture. By this process, and subsequently keeping out the air, the grain might be preserved for any length of time. As the reservoir would be perfectly air-tight and water-tight, it might be buried in the ground with perfect safety; and thus cellars might be rendered available for granaries, economizing space of comparative little value. The grain would be easily poured in from the surface, and to discharge it an Archimedean screw should be used. The size of the reservoir should be proportioned to the locality; and it should hold a specific number of quarters, so as to serve as a measure of quantity, and prevent the expense of meterage.

Reservoirs of this kind, of large size, should be placed in the ground, with rails running above them, so that waggons might run over them and discharge their contents inside by a hopper below. Thus, the grain of a corn district might be concentrated by railway at one spot, and discharged and reloaded at any time with the minimum of manual labour, without the expense of meterage, supposing the waggons to be constructed on the same principle of a specific quantity.

The communicating railways would thus transfer grain without trouble from one locality to another; and if run on to the docks and shipping, the same arrangements would serve both for export and import grain.

If constructed above the ground, a stair or ladder must communicate with the upper part, and the lower part must be formed like a hopper for the purpose of discharge. For many farm localities this arrangement might be best; and wheat might be thrashed into grain direct from the field, and stored.

For public granaries the reservoirs might be made in compartments, and provided with locks, keys, and seals. A merchant might deposit his grain therein, lock it up quite secure against fire, vermin, or robbery, and deposit for any length of time, quite sure that when he might come back he would find it in the same condition, and of the same quantity. Or he might transfer it when away from home, the purchaser receiving it as exact measure, without fresh meterage.

Granaries of this description would occupy less than one-third the cubic space of those of the ordinary description, and their cost would be less than one-fifth.

They might be erected in any part of Europe, without regard to locality or climate.

They might be built as government magazines, supposing it were desirable so to invest public money; but the greater security to holders would insure a much larger constant surplus than now usually exists under a sense of insecurity, against decay.

With this security for storing safely, a farmer would have less hesitation in sowing great breadths of land. He would not be driven to market under an average value, and might choose his own time for selling. The fear of loss being dispelled, people would buy with less hesitation, and the great food-stores of the community would by a wholesome competition insure the great mass of the community against a short supply. But so long as uncertainty shall prevail in the storage of grain, so long will it be a perilous trade to those engaged in it, and so long will the food of the community be subject to a very irregular fluctuation of prices.

There is nothing difficult in this proposition. It is merely applying existing arrangements to unusual cases. There needs but the practical example to be set by influential people, and the great mass will travel in the same track. To the wealthy agriculturist it will be but the amplification of the principle of the tin-lined corn-bin, that keeps out the rats from the oats of the stable. The experiment might be complete in a month; the experience may spread over all time, or till wheat shall cease to be a human food, by the substitution of some vegetable substance better fitted for the nourishment of man—a problem not yet solved.

I am, sir, yours faithfully,

W. BRIDGES ADAMS.

1, *Adam Street, Adelphi, October* 3, 1853.

—Spectator.

THE AMERICAN PROVISION TRADE FOR THE SEASON 1852-3.

In the last annual review of the provision trade at this port, an opinion was expressed that the high prices then current would stimulate the packing of beef to a greater extent than required. Messrs. W. Garduer and Co. report that the result has been in accordance with this view, the import exceeding by over 10,000 tierces that of any former year. The consequence of this great increase has been a dull and unsatisfactory trade to the importer and dealer, prices opening high, but slowly receding to about the present quotations, a further decline being arrested by the satisfactory state of the deliveries, which continued good throughout, as is evidenced by the stock now left on hand being only some 3,000 tierces greater than that of last year, notwithstanding our increased import.

The import of pork this year, in round numbers, shows 10,500 barrels from America and Canada, 16,000 barrels from France, and 11,500 barrels from Ireland. The quality of French and Irish maintains its superiority over the American; hence, the latter has ruled at prices considerably under the others, and has been, in a corresponding degree, difficult of sale. That there is no reason why this inferiority should exist, is proved by the fact that one brand of Philadelphia pork has, this season, sold at the price brought by the finest French. The contractors for the Government navy have obtained a large advance over last year's prices, and Hamburg curers ask 85s. per brl. for winter shipment.

The supply of American bacon is over four-fold that of the

year 1851-52, but of this excess only a very small part was originally intended for this market. In the next season there will, probably, be a large business in bacon; the comparatively moderate prices likely to rule for hogs in America have induced packers to make arrangements for curing more extensively for this market, and sales have already been made to some extent for forward shipment. The quality of the hams heretofore received from America, with few exceptions, has been very indifferent.

The supply of lard shows an increase over that of the two previous years; but the fluctuations in price have been much less than in 1851-52, good to fine lard not having touched a lower point than 50s. to 52s. at which figures it remained only for a very short time in spring, when the heavy part of the New Orleans shipments came to hand.

The receipts of cheese are fifty per cent. over last year's, with the prospect of a continued increase. In June, the duty was reduced from 5s. to 2s. 6d. per cwt., without causing any sensible reduction in price. As anticipated at this period last year, prices have ranged high; and, though a slight reaction may fairly be looked for from the present extreme figures, yet it is evident low rates are not likely. The make of English cheese is fair in quantity, but the prosperous state of the consuming classes has given such an impetus to consumption, that stocks have been reduced to a lower point than ever previously known; hence, until there is again an accumulation, prices cannot decline. A first-class article, as usual, brings a relatively higher price than an inferior.

Subjoined is a comparative statement of imports, stocks, and prices of beef, pork, bacon, cheese, butter, and lard, at the close of the last nine years:—

Comparative Imports for the Seasons 1846-7, 1847-8, 1848-9, 1849 50, 1850-1, 1851-2, and 1852-3.

Imports.	Beef.	Pork.	Bacon	Hams.	Lard.	Cheese	Butter
Years ending	Trcs.	Brls.	Cwts.	Cwts.	Tons.	Boxes.	Fkns.
Sept. 3 , 18.7.	19446	35634	53523	20318	4893	105284	9622
Sept. 30, 1848.	16423	31511	119 58	1 296	9572	106155	3480
Sept. 29, 1849.	26558	37152	224794	22768	4892	118780	8590
Sept. 28, 1850.	21081	20177	156347	15863	10049	108696	7973
Sept. 30, 1851.	27519	5762	66161	5714	3749	67479	12124
Sept. 30, 1852.	24814	1629	26103	94	3349	3890	5029
Sept. 30, 1853	41325	38164	118906	10159	4756	57855	5235

The last year's totals include American, Continental, and Irish; hitherto, in this table, American only has been noted.

Comparative Statement of Stocks in this Market.

Stocks.	Beef	Pork.	Bacon.	Cheese.	Lard.
Years ending.	Trcs.	Brls.	Cwts.	Tons.	Tons.
Sept. 29, 1849 ..	6475	13335	28840	—	1110
Sept 28 1850 ..	5 89	9321	9126	—	2030
Sept. 30, 1851 ..	9156	150	—	—	240
Sept. 30, 1852 ..	6319	555	1200	—	120
Sept. 30, 1853 .	10652	7307	16400	78	580

Comparative Prices at the Close of the Season (end of Sept.) in each Year.

Prices.	Beef.	Pork.	Bacon.	Hams.	Lard.	Cheese.
Years.	Per Trc.	Per Brl.	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.
	s. d. s. d.	s. s.	s. d. s.	s. s.	s. d. s.	s. s.
1843..	75 0 to 90 0	38 to 44	— to —	— to —	34 0 to 37	48 to 50
1844..	55 0 " 65 0	48 " 50	— " —	— " —	35 0 " 37	46 " 50
1845..	72 0 " 75 0	52 " 60	— " —	— " —	44 0 " 46	56 " 63
1846..	70 0 " 76 0	53 " 60	38 0 " 44	— " —	36 0 " 48	52 " 56
1847..	86 0 " 92 6	60 " 67	32 0 " 57	30 " 42	40 " 54	52 " 58
1848	87 0 " 92 6	40 " 62	30 0 " 45	30 " 34	39 0 " 43	48 " 54
1849..	76 0 " 85 0	37 " 66	24 0 " 38	27 " 42	35 0 " 37	30 " 42
1850	78 0 " 82 6	40 " 55	27 6 " 33	22 " 30	34 6 " 35	25 " 40
1851..	70 0 " 85 0	58 " 62	38 6 " 43	30 " 40	50 0 " 52	25 " 42
1852..	97 6 " 120	76 " 81	47 0 " 49	38 " 46	53 0 " 65	24 " 43
1853..	80 0 " 100	70 " 85	44 0 " 50	40 " 48	58 0 " 60	36 " 58

Comparative Prices of Cattle at Liverpool, and of Bacon and Butter in Belfast.

Years.	Comparative Prices at Liverpool Cattle Market, End of each Year.									Comp Prices of Butter and Bacon in Belfast.					
	Beef.			Mutton.			Pigs.			Bacon.			Butter.		
	Per Lb.			Per Lb.			Per 120lbs.			Per Cwt.			Per Cwt.		
	d.		d.	d.		d.	s.		s. d	s.		s.	s.		s.
1843....	4¾	to	5	4¾	to	5½	31	to	32 0	35	to	38	68	to	70
1844....	4¾	"	5¼	5	"	5½	45	"	48 0	34	"	44	74	"	76
1845....	5¼	"	5¾	4¾	"	6¼	48	"	49 6	42	"	45	82	"	84
1846....	5¼	"	5¾	5¼	"	6¼	54	"	56 0	55	"	57	87	"	89
1847...	5¼	"	5¾	5	"	5½	62	"	63 0	64	"	72	7	"	88
1848....	4¾	"	5½	5½	"	6½	57	"	60 0	60	"	64	72	"	80
1849...	4½	"	5¼	5	"	5¾	45	"	46 0	48	"	50	60	"	66
1850....	3	"	4¾	5	"	5½	40	"	42 0	37	"	42	64	"	70
1851...	3	"	4¾	5	"	5½	42	"	44 0	44	"	48	78	"	80
1852....	4	"	5	5½	"	6	43	"	46 0	50	"	56	72	"	80
1853....	5½	"	6	6	"	7	58	"	58 6	58	"	60	94	"	99

—Liverpool Times.

OUR FOOD PROSPECTS.

The *Economist* thus concludes an excellent article under this head:—"There is no doubt that we shall require large supplies of foreign grain. There is no doubt that we must be prepared to pay, compared with the last few years, good prices. But all the experience of the past, and all the information we can obtain of the present and the future, induce us to regard the prevailing notions on the subject as extravagant and greatly exaggerated. There is a point of view in which this subject is to be regarded at the present moment which has been entirely overlooked. When the scarcity of 1846 overtook us, we were habitually small importers of grain; yet all at once, although France, Belgium, Holland, Prussia, and the Mediterranean States were equally or more in want, and competing in the same markets, we were able to import, chiefly in the few latter months of 1846, 2,344,000 quarters of wheat and flour alone, and in 1847 no less than 4,464,000 quarters. *Now*, we are habitually and every year importers of about 4,000,000 quarters. For three years prior to 1846 we imported as follows:—

Wheat and Flour.	Qrs.
1843	1,064,000
1844	1,379,000
1845	1,414,000

With this ordinary scale of trade we were enabled suddenly to raise our imports to 4,464,000 quarters. During the last six years, notwithstanding the very low prices, our imports have been:—

Wheat and Flour.	Qrs.
1847	4,464,000
1848	3,080,000
1849	4,835,000
1850	4,830,000
1851	4,812,000
1852	3,960,000

With avenues open to us to supply such an increased quantity in ordinary years and at low prices, it is certain that the present very high range of prices will direct to this market an increased supply, quite as large, in proportion to the usual quantity, as we received in 1847. And, therefore, though we must be prepared to pay comparatively high prices, we may consider ourselves safe from those extreme prices, and the derangement consequent thereupon, which the extravagant estimates to which we have alluded point. And there is at least this consolation: As America will be our chief market of supply, and will most profit by it, we may look forward to a continued large demand from that quarter for our manufactures in exchange; and which, by affording good employment to our people, will at least mitigate the inconvenience of our own deficient harvest."

METEOROLOGICAL DIARY.

	Barometer.		Thermometer.			Wind and State.		Atmosphere.			Weat'r.
Day.	8 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Sep. 23	29.79	29.77	53	58	50	Westerly	var.	cloudy	sun	fine	rain
24	29.77	29.77	45	59	46	Variable	var.	fine	cloudy	fine	showery
25	29.43	29.20	42	62	50	S.W., N.	strong	cloudy	cloudy	fine	rain
26	29.55	29.90	46	57	46	N. West	brisk	fine	sun	fine	dry
27	29.92	29.92	40	54	53	S. West	gentle	cloudy	cloudy	fine	dry
28	29.94	29.89	53	62	61	S. West	rising	cloudy	cloudy	cloudy	dry
29	29.90	29.90	53	59	53	N.W., S.W.	var.	cloudy	cloudy	cloudy	wet
30	29.99	29.92	53	59	45	N.W., S.W.	gentle	fine	sun	fine	dry
Oct. 1	29.65	29 68	45	56	45	S.W., W.	brisk	fine	cloudy	fine	showery
2	29.80	29.90	39	56	40	N. Westerly	gentle	fine	sun	fine	showery
3	29.98	30.11	33	56	42	N.W., Var.	calm	fine	sun	fine	dry
4	29.98	29.70	40	53	53	S. West	brisk	cloudy	cloudy	cloudy	wet
5	29.44	29.30	50	56	48	S.W., S. by E.	brisk	cloudy	cloudy	fine	wet
6	29.36	29.40	41	50	48	Variable	gentle	fog	hazy	cloudy	wet nght.
7	29.40	29.43	38	59	52	W.S.W.	gentle	cloudy	sun	cloudy	dry
8	29.48	29.51	50	57	50	Every Way	calm	fog	hazy	fine	showery
9	29.59	29.72	44	65	46	S. by W. by E.	gentle	cloudy	sun	fine	dry
10	29.78	29.78	42	62	42	S., N. by E.	calm	fog	fine	cloudy	dry
11	29.71	29.72	50	56	51	Every Way	gentle	cloudy	fine	cloudy	dry
12	29.72	29.69	50	56	52	East	gentle	cloudy	cloudy	cloudy	rain
13	29.69	29.74	50	53	52	East	gentle	cloudy	cloudy	cloudy	rain nght.
14	29.76	29.73	49	60	50	S. by East	gentle	cloudy	cloudy	fine	dry
15	29.72	29.60	44	56	49	S. West	lively	fine	fine	fine	dry
16	29.48	29.42	44	49	43	S.W., Var.	lively	cloudy	cloudy	fine	showery
17	29.31	29.13	39	47	47	S. West	lively	cloudy	cloudy	fine	showery
18	29.40	29.45	38	55	46	N.W., Var.	gentle	fine	sun	cloudy	dry
19	29.16	29.0	42	52	50	East, S.	lively	cloudy	cloudy	cloudy	wet
20	29 32	29.75	48	55	45	N.W., W. by S.	gentle	cloudy	sun	fine	hintofwet
21	29.90	29.80	43	56	56	S. West	strong	cloudy	cloudy	cloudy	wet
22	29.82	30.01	54	62	57	S. West	brisk	cloudy	sun	cloudy	showery

ESTIMATED AVERAGES OF OCTOBER.

Barometer.			Thermometer.		
High.	Low.	Mean.	High.	Low.	Mean.
30.61	28.740	29.774	66	27	48.9

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
56.5	45.26	50.88

Weather and Phenomena.

Sept. 23. Equinox; rain early. 24. One clap of thunder. 25. Much rain; gleams. 26. Fine, lively air. 27. Overcast. 28. Fine, but threatening; wind at sunset. 29. Drizzle in evening. 30. Superb coloured parhelion at 7 a.m.; changeable.

Lunation.—Last quarter, 25th, 10h. 23m. forenoon.

Oct. 1. Rain; clearing brilliant sunset. 2. One sharp shower and rainbow. 3. Beautiful. 4. Many hours' rain. 5. Wet till 3 p.m. 6. Rainy night. 7. Fine, cheerful day. 8. Prodigious thunderstorm, with rain. 9. Fine and warm. 10. Fog, cleared about noon. 11. Fine, after night rain. 12. Much rain. 13. Wet night. 14. Hazy and warm. 15. Slight evening shower. 16. Heavy shower; generally fine. 17. Some fine intervals. 18. Very fine; changeable. 19. Profuse showers; dull at night. 20. A sprinkle early, then fine. 21. Wet and boisterous. 22. Early showers.

Lunations.—New moon, 2nd day, 10h. 18m. night; first quarter, 9th day, 3h. 26m. afternoon; full, 17th day, 31m. after midnight.

Remarks connected with Agriculture.—This period has been excessively perplexing and changeable. The land is soaked, and hitherto unmanageable. The situation is in fact one of much solicitude. The weather, however fine by day, has almost invariably deteriorated an hour before sunset; the wind backing from N.W. to S. and S.E., when rain has followed. I have seen a very small piece of green corn up, sown after a diseased potato crop, but have not heard of any seeding. Green crops and mangold, the latter particularly, are so far well.

Croydon. J. Towers.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR OCTOBER.

Owing to the extremely wet and unsettled weather, and consequently the saturated condition of the soil, the progress of ploughing and sowing has been seriously impeded during the whole of the month; indeed, as yet, not one-fourth of the land intended for winter sowing has been ploughed up, and the extent sown is limited in the extreme. These features are a serious drawback to the farmer, and are calculated to produce much uneasiness as respects the future. Exactly the same state of things was experienced in 1852, and the result is that we have produced an unusually short crop of wheat. In many parts of the country the land is partly under water, and some time must of necessity elapse ere it will bear the pressure of the plough. No doubt, from the altered and, we may add, improved position and prospects of the growers, every exertion will be made to increase the extent of land under wheat culture, at the present period and in the ensuing spring; but at present we are inclined to the opinion that the chances are greatly against the producers in this respect.

In several parts of the country, harvest work has not yet been brought to a close. It is true that the quantity of corn in the fields is comparatively small, consisting chiefly of oats and beans; but it is evident that it must have received much damage from long exposure. We regret to assert that the new wheats are turning out very deficient in quantity; indeed on some of the light lands the produce is very little more than three sacks per acre. Even with the present high prices, this is a very poor return. The yield of barley is undoubtedly large; but a portion of it is only fit for grinding purposes, arising from the weathered and stained condition in which it has been got in. Our reports in reference to oats, beans, and peas are favourable, those crops having proved heavy and of good quality. Notwithstanding that we have had fair average importations, and that large arrivals of grain and flour are anticipated from the United States, the corn trade, arising from the short crops on the continent and the rapid increase in the consumption here, together with the steady demand for export to France and the difficulties which have beset the Eastern question, has been very excited, and a further rather considerable advance has taken place in the quotations. As regards the future value of grain in this country, various opinions have been offered, but the majority of them are in favour of a further advance. The stocks of foreign produce now in the United Kingdom are undoubtedly small; but, on the other hand, we have rather more than an average quantity of old English wheat on hand. But the difficulty to be met is the absolute necessity of supplying the deficiency in the new crop, and at a time, too, when France and other nations are competing with us abroad, instead of forwarding supplies to us, as in the ordinary run of years. Our impression is that prices will yet go higher; and yet it is possible that America will be able to furnish us with all that we may require, with the present tempting prices. Evidently the crops have turned out much better both in Ireland and Scotland than in this country; yet the great deficiency in the supplies of really sound potatoes has more than counterbalanced the effect which any additional supplies from those quarters may have had. That the disease has committed serious ravages amongst the potatoes is evident, and it is much doubted whether even a moiety of the crop will be found fit for storing. Prices have consequently ruled very high, the best Regents having realized as much as £9 per ton. The decree of the French government forbidding the export of potatoes, is calculated further to enhance the value of that esculent, and to increase the consumption of bread to some extent.

The markets for the sale of live stock have been rather better supplied; hence the demand has been less active, and prices have had a downward tendency. The present value of both beasts and sheep is very remunerative, although it cannot be doubted but that the greatest profits are being realized by the breeders. The supply of grass has continued good; yet, in consequence of the puddled state of the pastures, it has scarcely been available, except by mowing. Linseed and rape-cakes have advanced considerably, arising from the active demand for those articles; whilst linseed, both English and foreign, has been on the advance, with every prospect of higher rates during the winter months.

The hay and straw markets have been firm, and prime meadow and clover hay has sold at very high rates. The quantity of inferior hay now

brought to market is very large—a decided proof that an extensive portion of the crop was greatly damaged at harvest time.

The Irish and Scotch markets have ruled firm for all kinds of produce at higher rates. Large shipments of potatoes have been made from Ireland in excellent condition, and it is stated that they will be continued during the remainder of the year.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that a very large consumption is going on, there has been less activity in the demand for fat stock, the prices of which have in some instances had a downward tendency. The supplies have been seasonably good as to number, but very deficient in quality. We are somewhat surprised at this latter feature in the trade, because on the whole the past has been a favourable season for the rearing of stock, especially beasts, from the great abundance of food—both the carrot and turnip crops having turned out most abundant, and the supply of grass having been exceedingly good; besides, very few cases of disease have been noticed in any of our leading districts. Possibly the various strikes of workmen have tended to keep prices in check, and the high currencies have, no doubt, tended to decrease the consumption of meat amongst other classes.

The large fairs have passed off extremely well, and high prices have been realized, with an active demand, although the supplies on offer have been large. The deficiency in the yield of rough fat, the small arrivals from Australia and South America, and the unfavourable state of affairs in the East, have all tended to strengthen the market for tallow, the price of which has risen immensely. Rough fat, which at this time last year was selling at 2s. 5d., has advanced to 3s. 4d. per 8 lbs., being the highest figure known for many years past.

The decree of the Emperor of the French admitting stock into France at a low duty has not had much effect upon the importations of foreign stock into the United Kingdom. Those of the month just concluded have been very liberal; but, with the exception of a few of the Dutch sheep, in very middling condition.

The following are the arrivals from abroad into London :—

	Head.
Beasts	8,190
Sheep	30,643
Calves	1,797
Pigs	1,585

IMPORTS AT CORRESPONDING PERIODS.

Oct.	Beasts.	Sheep.	Calves.	Pigs.
1852 ..	7,792	26,672	1,350	1,624
1851 ..	5,239	18,688	1,495	1,912
1850 ..	5,929	20,982	1,312	1,702
1849 ..	5,008	16,190	565	243
1848 ..	2,962	10,669	803	116
1847 ..	5,433	17,635	1,225	433

The total numbers of stock exhibited and disposed of have been :—

	Head.
Beasts	27,327
Cows	545
Sheep	145,400
Calves	2,517
Pigs	3,112

COMPARISON OF SUPPLIES.

	Oct., 1849.	Oct., 1850.	Oct., 1851.	Oct., 1852.
Beasts	22,477	23,116	22,092	26,134
Cows	457	440	450	545
Sheep	146,200	138,110	119,050	132,400
Calves	1,946	2,1 0	1,599	2,556
Pigs	2,085	3,615	3,470	2,770

From the northern grazing districts, about 10,000 short-horns have come to hand. The receipts from other parts of England have amounted to 3,000 Scots, Herefords, runts, &c.; and from Scotland, 200 horned and polled Scots. Beef has sold at from 2s. 6d. to 4s. 4d.; mutton, 2s. 8d. to 5s.; veal, 3s. 6d. to 4s. 10d.; pork, 3s. 6d. to 4s. 10d. per 8lbs., to sink the offals.

COMPARISON OF PRICES.

	Oct., 1849.	Oct., 1850.
	s. d. s. d.	s. d. s. d.
Beef, from	2 4 to 3 10 ..	2 4 to 3 10
Mutton	2 8 4 0 ..	2 10 4 0
Veal	3 0 3 6 ..	2 6 3 8
Pork	3 2 4 2 ..	3 0 4 2

	Oct., 1851.	Oct., 1852.
	s. d. s. d.	s. d. s. d.
Beef, from	2 6 to 3 8 ..	2 0 to 3 10
Mutton	2 10 4 2 ..	3 0 4 6
Veal	2 8 3 10 ..	2 6 4 0
Pork	2 10 3 10 ..	2 10 3 10

Very large supplies of country-killed meat have been on sale in Newgate and Leadenhall. The general demand has, therefore, been in a sluggish state, on the following terms :—Beef, from 2s. 6d. to 3s. 10d.; mutton, 2s. 8d. to 4s. 8d.; veal, 3s. 2d. to 4s. 4d.; pork, 3s. 6d. to 4s. 10d., per 8 lbs. by the carcase.

NORTH OXFORDSHIRE.

Now that our white corn is nearly all in-gathered, a word or two may be ventured thereon. As to the wheat crop, as a whole it is a miserable failure: farms that usually produce from forty to forty-four bushels per acre are this year yielding from fifteen to twenty bushels; and some well-cultivated wheat and bean lands are yielding but from eight to ten bushels per acre, and carried in not very good condition. Barley a very fair average crop, and carried in good order; it is malting well. Beans a liberal crop while standing; but,

though cut, are yet exposed in the field to the continued drenching rains that have visited us; and, should the same continue, the crop will be much shed out. Potatoes sadly diseased, and an insignificant yield. As to the quantity of old wheat in farmers' hands, there certainly is more than usual at this time of the year, and markets for the present are rather heavy. Nevertheless this dist ict will need a deal of foreign aid before the harvest of 1854; and what further effect the quarrel between the Bear and the Turkey may have on the English markets remains yet to be seen. Out-of door stock is not doing so well as could be wished, owing to the low temperature and wet weather. At all our recent fairs, store and fat cattle have been realizing rather less money, with a somewhat downward tendency, and when grass feeding is at an end cake will be found expensive, and hay scarce and inferior. October 16 and 17, heavy rains; floods coming out.—Oct. 18.

YORKSHIRE.

With one or two exceptions, we have had fully three weeks of dull, cold, rainy weather. The wet has caused a complete cessation of all active out-door operations; and the remains of the latter harvest, we are sorry to say—all the beans, the bulk of spring wheat, and some oats, are, by being exposed to the action of the weather, rendered so soft as to prevent the hope that it can ever be fit to thrash till after the drying winds of spring. It is, moreover, sadly sprouted, and a sad waste of this last resource will doubtless inevitably take place. We will give a faint idea of the extent of the loss to which we now refer. Commencing at the Tees, and from thence to Catterick, at Stokesley, and embracing the lowlands of Cleveland, and eastward of Thirsk to the sea, westward of Harrowgate, and from the Humber to the sea, arriving at Hesle as a point, vast quantities of corn are abroad and spoiled by the wet, with a rainy sky overhead; a full fifty per cent. of the potatoes irrecoverably diseased, and a new demand for seed has sprung up, with small stocks of old corn. We have no wish to be alarmists; corn may come from quarters abroad of which we have now no idea; but it is certain that the whole of the wheat-growing districts of this county are, as we have from month to month since May last described them to be, deficient and spoiled beyond any former period within our recollection. We never knew the farmers who have got their harvest well hurry it so to market. Twenty steam-engines are at work every day they can stand out, and some days when they ought not to work at all, and yet the market is never a dead one. What it will be when the seed demand grows greater, and when, for sowing-operations, thrashing cannot go on, we will not venture to predicate; but the universal feeling is, that wheat is at its lowest point up to next harvest, under any possible circumstance. The turnips are beginning to cease growing. The aphides, which so filled the air, and from occurring at the period when so many persons were dying at Newcastle, have got the name of "cholera fly," have done serious damage to some fields. We hope, however, so far, the plants are free from any other disease; and though there are no swedes almost from one end of the county to the other, the white turnips are better than an average crop. The weather has been very unfavourable for clearing stubbles and getting out manure; plashing hedges, and ploughing dry seed by horse, being the principal occupation of the farmers.—Oct. 21.

HERTFORDSHIRE.

It is very extraordinary at this period of the year not to have concluded the harvest in this county. Such, however, is the fact, as there are many fields of oats not yet carted, and a considerable portion of the spring-sown beans, with an occasional field of barley; indeed, there are some few fields of Lent corn not yet cut. The yield of the wheat crop is generally considered deficient, and is estimated at one-sixth under the average. The crop of barley, when cut, was not so bulky as had been anticipated, from its being generally much laid. The oat crop did not ripen so regularly as usual, which will much affect the sample. Winter beans are well podded, and will probably prove a full average crop. Spring beans vary much—some being very fine, others defective. Peas are not an average. There is a good plant of turnips generally: the bulbs are not so large and fine as they probably would have been with warmer weather. Labourers are fully employed, and earning by the day eleven shillings per week. The "potato disease" made sad havoc in the month of September, destroying half the produce, which had previously been free from taint. Fortunately the commerce and trade of the country appear in a prosperous state, by which it may be hoped that consumers will better be able to meet the higher range of prices that is likely to prevail.—Oct. 21.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ALCESTER FAIR was tolerably well supplied with stock of every description. The show of Sheep was good, and realized 6½d. to 7d. per lb. Stores rather lower. Beef, 6d. to 6½d. per lb. Pigs, 10s. per score. Horses very few, but fetched high prices.

ASHBOURN FAIR.—The supply of both horses, horned cattle, and sheep was greater than has been witnessed for some time past. There was a large attendance of buyers from various counties, and a great amount of business transacted. Fat Beasts realized 5½d. to 6d. per lb. Prime dairy cows were in request, at advanced prices. Fat sheep realized 6d. to 7d per lb. Useful draught-horses and promising colts were much sought after, and brought high prices, £50 each being asked, and obtained, by several farmers in the neighbourhood.

AUCHTERARDER OCTOBER MARKET was well attended. Beet sold from 8s. to 8s. 6d. per Dutch stone; three-year-old stots and queys from £8 to £11; two-year-olds from £7 to £10 5s.; stirks from £3 to £4; milk cows from £6 to £10.

BEDALE FORTNIGHT FAIR.—We had a plentiful supply of stock, and a brisk business transacted, at a slight reduction in price for fat and holding stock. In-calvers maintained their value. Beef, 6s. 3d. to 7s. per stone; mutton, 5½d. to 6½d. per lb.

BISHOPSTOKE CHEESE MARKET, Oct. 20.—The supply of cheese was nearly 400 tons. The sale was very slow, and a large portion was left unsold. Prices were 2s. to 4s. per cwt. lower. In the cattle market there was a large show of beasts and sheep; prices rather lower, and a heavy sale. The supply of hops was good; one merchant, Mr. Grey, of Bishop's-Waltham, pitched more than 100 pockets, and sold a considerable portion.

BLYTH FAIR.—The show of sheep, beasts, and calves has not been so large for many years. The day was beautifully fine, and there was a large attendance of dealers and farmers from the neighbourhood. All were sold up at improved prices; and this may be considered one of the best fairs that have been held for several years.

CAISTOR FAIR.—The show of sheep, of every description, was very large, but few sales took place, and these were at reduced prices, of from 2s. to 4s. per head. There was also a large show of beasts, and a great many were sold at prices rather below former rates. Good horses and cart foals were very much sought after, and the prices were very high. Good

ponies sold well, almost anything useful fetching from ten to twenty pounds.

CHIPPENHAM GREAT MARKET was full to an overflow; nearly 300 tons of cheese were brought, but, being so close after Reading Fair, the trade was not so good. Farmers were obliged to meet the factors at a reduction of from 3s. to 4s. per cwt.; the consequence was that a great quantity remained unsold. The prices were as undernamed:—Broad doubles, 54s. to 64s. per cwt.; prime Cheddar, 66s. to 76s.; thin, 52s. to 58s.; loaves, 56s. to 70s.; skim, 28s. to 35s.

CLIFTON-ON-TEME FAIR.—There was a good show of stock and a numerous attendance of buyers. Beef made 5½d. to 6¼d. per lb.; two-year-old steers from 15 to 20 guineas; ewes, 6d. to 6½d.; wethers, 6½d. to 7d per lb., and, in some instances, a shade higher. Some yearling wethers sold by Mr. John Davis, of the Hill, produced £2 13s. 6d. each. Pigs commanded high prices. A few horses were brought.

CRICH FAIR.—There was a very large supply of sheep, especially of store ewes, which were easily disposed of at from 38s. to 47s. each. There were several pens of lambs of a very superior kind, which fetched from 24s. to 32s. 6d. The cow show was not quite so great as usual, but good prices were readily obtained. Pigs were plentiful, and sold at satisfactory rates.

DALKEITH MARKET.—The stock was principally composed of six quarter, two-year-old, and three-year-old shorthorns, with a few lots of red good West Highlanders and polled Galloways. The buyers were numerous, and large prices were got for the better-conditioned stock in the early part of the morning, but after that time a lull was observed. After the arrival of the eleven o'clock train and coaches a stimulus was again thrown into the trade, and many sales were shortly afterwards effected. The stock was principally in the hands of English dealers and salesmen. All but a clearance was effected amongst the better kinds; for the secondary class there was a very fair demand, and at the close of the market a good number of the inferior kinds remained unsold. Really good beasts brought as good prices for shorthorns as at East Linton, which was allowed to have been a good market. The three-year-old shorthorns was rather short in point of numbers, but the quality was good. There was a fair show of small Irish cattle, and a couple of lots of very good Irish, for which £18 was refused, were at an early hour in the day driven off unsold for the Edinburgh market. At the close of the market a very considerable number of the second quality and inferior kinds remained unsold. The market, upon the whole, was allowed to be a good one, and fair prices were obtained, more particularly for good stock. The secondary qualities towards the afternoon would be about 5 per cent. below recent markets, and the inferior kinds down about 7½ per cent. All the fat were picked up at an early hour in the forenoon, at 8s. 6d. the Dutch stone; and many parties who came to purchase could not get a beast. The Irish cattle was a large show, and a fair demand for good stuff; but a few lots of the inferior kinds were left unsold. One-year-olds brought from £6 10s. to £7, two-year-olds from £10 to £12, and a few lots of three-year-olds from £13 to £14 16s. The milch cow market was very thinly attended, and the best milch cow only brought somewhere about £10 5s., the second class about from £7 to £8, and down in a few instances to £6 10s. The turnip crops in Cumberland and Westmoreland are turning out good, through Yorkshire rather bad, in the county of Dumfries rather middling, and in several districts of the Lothians something in the same way. There is no doubt that, had it not been for the deficiency of the turnips, lean cattle would have been much higher in price. Six-quarter shorthorns ran from £6 10s. to £10, two-year-olds from £9 to £13, this description (two-year-olds) were a little back; three-years-olds from £12 to £15 10s. for the better kinds; polled cattle from £10 to £14, and some of the inferior kinds so low as £8 to £9. The horse market was pretty numerously attended, but the bulk was rather of an inferior description. The few good draught horses that were there brought the prices of recent markets, but the inferior kinds were decidedly from 5 to 7½ per cent. below what was obtained even last week. The few really good saddle and harness horses that were there, and disposed of, are hardly worth quoting, as it would form no criterion for other markets.

DEVIZES FAIR.—The supply of sheep was very extensive, there being upwards of 25,000 penned (nearly 5,000 more than were penned last year), the quality of which was generally good. The late heavy rains have had a depressing influence upon the trade, and prices must be quoted 2s., and in some instances 3s. per head under late fairs. The supply of cattle is short, and not much business is doing in this description of stock. Beef sold at from 10s. to 10s. 6d. a score; stock animals about 30s. a-head below the prices of late fairs. Good cart colts found ready purchasers.

DONINGTON FAIR.—Horses of good quality of the draught kind commanded high figures, and readily sold. There were but few superior horses in, and, for want of better choice, the horse trade was dull. There was a pretty good supply of horned cattle; prices were rather lower than of late.

FALKINGHAM FAIR was well attended, but the trade, upon the whole, was not so good as it was a short time ago. A pen of 42 shears was shown by Mr. William Wilkinson, of Aslackby, and was very much admired for their excellent quality; they were sold for 77s. a-head. Shearlings ranged from 45s. to 52s., and lambs from 27s. to 34s. each.

GLOUCESTER MONTHLY MARKET.—There was a large supply of stock, more particularly of sheep, which were more than equal to the demand, and consequently the trade was duller than at some previous markets. Of beasts there was an average supply, and nearly all sold. Beef ruled from 6d. to 6½d. per lb.; mutton, from 7d. to 7½d. per lb.

GLOUCESTER CHEESE MARKET.—On Monday last above 200 tons were pitched, which, in consequence of the previous humid state of the atmosphere and unfavourable day's weather, was in inferior condition, and met a dull sale, at the following reduced prices:—Best doubles, from 64s. to 68s.; singles, 54s. to 60s.; seconds, 48s. to 52s.; skim, 30s. to 34s. per cwt. A considerable portion remained unsold at the close of the market, and the want of a warehouse to stow it in until next market was much felt, particularly by persons from a distance. A quantity of cheese again remained outside the market for want of sufficient space to pitch it in the sheds.

HEREFORD FAIR.—We never saw a larger number of first-class beasts, but we regret to add that the torrents of rain which fell up to nine o'clock in the morning, as well as intermittingly during the day, had a very depressing effect upon sales, and values ruled from 5 to 10 per cent lower than at late fairs. As an instance of the importance of the Hereford October Fair, we may mention that three owners alone had 400 beasts in offer, which realized upwards of £12,000; and that there are many breeders who each bring to this fair from thirty to sixty cattle. A yearling steer of Mr. E. Lewis, of Breinton, sold for £25; a three-year-old steer of Mr. Carwardine, £40; and six steers of Mr. Alford, of the Thorne, realized £180. On Thursday, the morning opened remarkably fine. Our streets were filled at an early hour with an immense number of our far famed breed. The depression of the previous day was still obvious, and, although a large number of animals exchanged owners, a great amount of stock returned home unsold. Fat cows realized about 6d., and fat steers 6½d. In the sheep fair there was a great falling off in the number in offer; wethers were worth from 6½d. to 7d. The demand for pigs was brisk, both stores and bacons. The horse fair was thronged; there was as usual animals of all descriptions; everything useful for the saddle or the collar, the road or the field, sold readily at a high value. Cart colts, suckers, from Wales, were not so numerous in offer as usual; they realized from £12 to £14. In the cheese and butter fair there was less quantity of both articles than is commonly pitched. Welsh butter opened at 11s. and 12s. per stone of 12 lbs., but rose rapidly to 13s. and 14s. The value of cheese held a wide range from 4d. to 9d. per lb. About 200 pockets of hops were pitched; 141 passed the scales. Values realized from £11 to £13.—*Hereford Times.*

KIRKMICHAEL TRYST.—The number of cattle exhibited was 396, and most of them, considering the bad grazing season, were in fair condition. Scarcely were the stock placed when sales commenced with animation, and before half-past ten it was obvious that there were more money and jobbers than stock, as several important lots of the above number were previously sold, and were only brought up for delivery. Holders, tempted by the high prices quoted at Blairgowrie market the day before, insisted for high figures, which were in general got. A panic seized transactions, and from eleven to twelve o'clock, sales, especially for inferior stock—such as yearling winterings—brought rates that, in comparison with former

years, may be termed "wild." Three-year-old stots, half-feds, from the Ashintully and Bleason parks, £9 10s. to £12; two-year-old stots and queys £8 to £10; very inferior stirks, that first-class breeders would scarcely look at, were bringing £5 5s. each. The market slacked towards the afternoon, when lower prices had to be submitted to, and before four o'clock a full clearance was effected. The district may now be said to be cleared of its cattle for a season. The market site was flanked with several pens of shot ewes, the demand for which was but indifferent.

LINCOLN FAT STOCK MARKET.—There was only a small show, both of beasts and sheep. The trade ruled very dull, and prices were a trifle on the decline, beef realising 6s. 6d. per stone, and mutton 6½d. per lb. Some prime pens of wethers made 7d.

MARKET HARBOROUGH FAIR was well supplied with store beasts. A good amount of business was done; but prices were considered a little lower. There was an average quantity of fat stock, which sold well. The supply of sheep was fully an average of former years. There was a good business done among horses, good animals fetching high prices.

MICHELL FAIR was well supplied with cattle of all descriptions. The sale of sheep in the early part of the day, owing to the high prices asked, was rather slow, but ultimately a good clearance was effected, at about late prices. Fat bullocks of good quality sold at from 56s. to 60s per cwt.; store bullocks, especially steers and oxen, were in good demand, and a great many changed hands. Cows and calves sold freely at high prices, and, upon the whole, it was considered that prices were a shade in favour of the buyer.

NEWTON-STEWART OCTOBER MARKET.—810 head of cattle exposed, of which about one-third were three-year-olds of prime quality. The rest consisted of two year-olds and stirks. A large proportion of the latter were Irish. Owing to the dull accounts recently received from the south, the market opened remarkably flat, and sellers, before any sales could be effected, were obliged to submit to a reduction from previous rates, variously estimated at 10s., 15s., 20s., and 25s. a-head. It was extremely difficult to obtain the current prices, as neither buyers nor sellers seemed willing to divulge them. The highest we could hear of was £12 for three year-olds, and from £7 10s. to £8 10s. for two-year-olds. More than the half were driven off unsold. There were likewise six score of sheep in the field, a part of which were sold, but at a considerable reduction from former quotations. Of pigs there were eight carts sold, at prices varying from 6s. 6d. up to 10s. each.

NORWICH ST. FAITH'S FAIR.—The number of Scots was about 1,200, their size, condition, and quality very prime. Short horns and Irish were greater in number than have been known for years, and both large in size and excellent in quality. Sales commenced very slowly; owners and salesmen asked high prices; buyers tried very hard to have it their own way. Up to two o'clock little was done; the last two hours, however, a great many cattle were sold; the highest prices we heard of for Scots were £21, and one lot at £22 per head: these were splendid beasts, many quite fit to slaughter. We may quote the general figures at from 4s 6d. to 5s., 5s. 6d. to 6s. per stone, according to size and condition; short-horns, 4s. 6d. to 5s 6d.; and Irish, although good, quite neglected. It should be remarked this fair is well deserving its name for good Scots, and they had the preference, compared with some first rate short-horns. The owners from the north complain, and very justly, of the high prices given for their cattle in the spring, many losing nearly their summer keep; they admit prices are high enough, but we fear it will turn out a losing fair. The same may be said of other breeds. At the close more than half were unsold. Very few horses shown, and little doing in the trade.

TADCASTER FORTNIGHT MARKET.—We had a very large show of stock, especially sheep. Beef, 6s. 9d. to 7s. 3d. per stone; mutton, 6½d.; veal and pork, 7d. per lb.

CALENDAR OF AGRICULTURE.

Finish the sowing of wheat, if any remains undone from the last month. Take up Swedish turnips, store the roots in covered heaps at the homestead, and give the tops to the sheep in the fields, or to young cattle in the yards.

Flood watered meadows, clean out and put into proper order for use the main channels, conveying gutters and the sluices of flood-gates.

Begin to cut underwoods, plant forest trees, open drain plantations, repair old fences and make new ones, cast open ditches, and repair roads.

Thrash by machine twice in a week regularly, to supply the beasts with fresh straw to eat, and the yards with litter. Cut for the horses, chaff from hay and straw mixed, for the fattening bullocks tied up, and for being steamed for milch cows. Apply all litter for the yards thinly and evenly, and spread over the surface all substances of different qualities for the purpose of being mixed.

Supply to the cattle in the yards, by break of day, an ample feed of turnips, topped and rooted for the fattening animals, and with the tops attached for the other sorts of cattle. Wooden cribs with latticed bottoms suit best, as the rain and filth escape freely downwards. The turnips should be all consumed by night, to prevent accidents by choking, happening unseen during darkness. Give milch cows cabbages and beet-root, and one meal daily of steamed meals.

Continue the fattening of sheep, as directed last month. They may be folded over the night on the bared ground in mild climates, but very generally they must be allowed to run back for shelter.

Feed swine, as directed last month, give ample littering, and keep the animals dry. Feed poultry with light grains, and with steamed potatoes and meals mixed, and given in troughs placed in a shelter shed in the poultry yard.

Attend to the feeding of young horses in the farm-yard. Provide a regular supply of fresh water in a trough, and a dry and convenient shelter shed; give hay and straw, chaff, bran, and oats, and a feed once-a-day of raw or steamed roots. The first winter's keep has a very great share in making good animals.

Begin to plough stubbles, and follow with the subsoil plough, and prepare by fallowing the lands intended to be planted with early green crops, so long as the weather permits. This autumnal fallowing very much expedites the spring working of the land, and also retains the winter's moisture for the use of the plants.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF OCTOBER.

The harvest has this year been protracted to an unsually late period; indeed, at the present time (the close of October) there is still some quantity of corn abroad in the backward districts. That portion of the crop which was carried early was secured in good order, but during the greater part of September we had frequent and heavy rains; and since then the weather has been of the most unfavourable character. Nearly the whole of the spring-sown wheat, which from the absence of genial warmth in the early part of the summer did not arrive at maturity till late in the autumn, has consequently suffered in quality from the recent rains, and no inconsiderable part has been rendered altogether unfit for human food. Spring-sown wheat must always be considered a precarious crop in our uncertain climate, and we therefore consider an undue quantity of wet in autumn as a matter of serious importance in reference to the prospect for the next crop. The very unsatisfactory result of the last harvest is, in our opinion, to be mainly attributed to the excess of wet in the autumn and winter of 1852. It is now generally admitted that only about three-fourths of the breadth of land usually cultivated with wheat were sown at the regular and natural time: the remaining fourth was sown at different periods, as opportunities offered; and the produce of some of the latest of these sowings still remain in the fields.

With these proofs of the dangers that attend a late seed-time before us, the weather lately experienced has naturally been the cause of serious uneasiness. Since the beginning of October we have scarcely had three consecutive days without rain, and the land has become so completely saturated that weeks of drying wind will be needed to free it of superfluous moisture so as to restore it to good working order. Unless, therefore, a speedy and complete change takes place in the weather, there is reason to fear that the country may be placed in a similar predicament to last year, with regard to the seeding of the land. The possibility of such an occurrence is naturally viewed with considerable apprehension; and the rise in prices, which had its origin in the first instance in the unfavourable result of the last harvest, has since been further stimulated by the fear of what may be the effect of another bad seed-time. We are unwilling, however, to anticipate difficulties, and hope that we shall be spared such a visitation. A few weeks of dry open weather would suffice to allow farmers to get on the land; and the existing high prices will no doubt cause them to cultivate wheat more extensively than usual this season, provided it should be possible to get the seed into the ground under tolerably auspicious circumstances. Meanwhile we must make up our minds to a comparatively high range of prices for food, from the present time up to next harvest.

Taking the wheat crop of Great Britain at about two-thirds of an average (and it certainly cannot be safely estimated higher), it will need an enormous importation to keep down quotations; and it is an undeniable fact that great difficulties exist at present to obtaining large supplies of foreign corn. The most important of these is the competition which we shall have to enter into with France, which stands fully as much in need of supplies as England. The estimated deficiency in the wheat crop of that country is at least *one-third*; and it is calculated that France will have to import nine and a-half millions of quarters to provide her population with food up to the harvest of 1854. If to this we add the probable quantity that Great Britain will require—say, in round numbers, five millions of quarters additional to her usual imports—it becomes a question of vital importance from whence these enormous supplies are to be obtained. In many of the countries bordering on the Baltic, which in ordinary seasons furnish a great portion of the wheat imported into Great Britain, the harvest has not given a much better result than with us or in France; but as wheaten bread is not the staple article of consumption in those parts, high prices may draw good supplies. Still, when the surplus left for export is divided between this country and France, it will go but a short way towards making good so great a deficiency as that named.

In the south of Europe the wheat crops have generally proved short; indeed in some of the Italian states the scarcity is so great, that prices have already risen to a point to occasion serious deprivation and misery among the poorer classes.

The Mediterranean ports will not only have nothing to spare for shipment to England, but will have to import largely from the Black Sea, thus taking from us some of the supplies which Odessa, Galatz, &c., might otherwise have been enabled to furnish. The great difficulty, however, in obtaining supplies

from the Black Sea has hitherto been the scarcity of ships and the exorbitant rates demanded for freight. Immense stocks are lying on the banks of the Danube, which cannot be transported for want of vessels; and there appears at present to be little prospect of this obstacle being removed; indeed, if war between Russia and Turkey should be actually commenced, supplies from the Black Sea might be entirely cut off. It seems therefore that we cannot with safety place much dependence on substantial assistance from thence so long as the Russo-Turkish quarrel remains unsettled. In this state of affairs we have only America to turn to; and we greatly fear that the resources of that country, though unquestionably great, have been extravagantly over-rated. We have no better means of judging of what may be expected than the data afforded by past experience. The largest exports from America on record occurred in 1847, when wheat was worth over five pounds per qr. in the English markets. With this strong inducement to ship, the entire quantity furnished by the United States was as follows:—

EXPORTS FROM THE UNITED STATES, 1847.

To	FLOUR. barrels.	WHEAT. bushels	CORN. bushels	MEAL. barrels.	RYE. bush.
Great Britain.	2457076	2544563	15126515	712083	6392
France.....	612641	749224	7268	4401	3006
All others ..	1313779	1106146	792287	231576	37696
	4382496	4399951	16326050	948060	48092
Total Exports in 1846 ..	1613795	2289476	1826063	298790	68530
Total Exports in 1848 ..	2119393	2034704	5817634	582339	41184

The prices then current in the European markets afforded strong inducement to gather together all that could be collected in the interior, and it would probably require the same stimulus to ensure a similar quantity from the other side of the Atlantic.

Up to the present period the importations into the United Kingdom have been on a liberal scale. During the month ending 10th inst. the arrivals amounted to

Wheat	468,688 qrs.	Beans	35,706 qrs.
Barley	56 472 „	Peas	6,742 „
Oats	158,633 „	Maize	126,512 „
Rye	7,373 „	Flour.....	463,545 cwt.

But we are now approaching a period of the year when the supplies usually fall off; and further, it may be remarked, that the large shipments which have been made from the continent of Europe during the summer have nearly exhausted the stocks of old corn; and the prevalence of wet weather at harvest time having caused a large portion of the new to be carted in soft condition, but few of the parcels which have come forward at the different shipping ports have been in suitable order to stand a sea voyage. The probability is, therefore, that the importations will be comparatively light until the spring of next year; and though we are inclined to think that the stocks of old wheat (of home-growth as well as foreign) are rather large, these are being rapidly diminished, as it is impossible to work the general qualities of this year's growth without a large mixture of old. There is consequently reason to believe that present quotations will be at least supported; and many are of opinion that fine wheat will touch 100s. per qr. before Christmas. Thus far we have had but little demand for wheat on this side of the Channel on Irish account, though it is well known that the produce there was exceedingly light, and that a very large proportion of what was secured will be needed for seed. It is therefore more than probable that England will, as the season advances, be called upon to furnish the sister isle with supplies of wheat, more especially as the potato disease is now admitted to have been more destructive there than was at first believed.

Potatoes are also becoming very scarce and dear in the English markets, and in the neighbouring counties of France and Belgium the loss has been so great, that the respective Governments have deemed it necessary to prohibit the export.

The foregoing facts speak for themselves, and we shall enter into no predictions as to the probable future; but it may be safely concluded that prices of wheat cannot undergo any material reduction under almost any circumstances that can occur. With this remark we shall conclude this part of our subject, and proceed to give our readers as clear an account as we are able of what has taken place at Mark Lane since we last addressed them.

The excitement which prevailed up to the close of September diminished in the beginning of the present month, and a period of comparative calm succeeded. This was, no doubt, caused by the desire of those who had bought some time previously to realize their profits, and further by increased caution on the part of buyers for consumption, who preferred to work up their old stocks before entering into fresh engagements at the enhanced terms. The steps taken by the Directors of the Bank of England in raising the minimum rate of interest to five per cent. had also considerable influence, inasmuch as it lessened the facilities which might otherwise have been afforded to those disposed to hold, and speculative operations were greatly checked thereby. Notwithstanding all this, the quiet was of but short duration, the accumulation of evidence in regard to the deficiency of the harvest in this country and France rendering merchants and millers unwilling to allow their stocks to run very low.

The arrivals of English wheat coastwise into the port of London have been small, and the quantity brought forward by land-carriage from the neigh-

bouring counties quite insignificant. The quality of the new wheat does not improve, and the extreme humidity of the atmosphere has caused the greater part to come to hand in very indifferent condition. On Monday, the 3rd instant, sales proceeded slowly, and factors experienced considerable difficulty in obtaining previous rates. A week later this was no longer possible, and on the 10th inst. a decline of about 2s. per qr. was very generally submitted to. This concession brought forward more buyers, and on the succeeding Monday a portion of the abatement had already been recovered. On Monday last the quantity on sale proved inadequate to meet the demand, and prices rose 2s. to 3s. per qr. Quotations are therefore now higher than ever, and there is an appearance of a further rise. The finer kinds of white wheat are worth 80s., and the best samples of red cannot be purchased below 75s. per qr. The last weekly average price of the kingdom is 68s. 1d. per qr., being 30s. per qr. more than what it was in the corresponding week in 1852.

The arrivals of foreign wheat were moderate in the early part of the month, but during the week ending the 15th instant 75,000 qrs. came to hand, a large portion from the Baltic. Many of the cargoes had been a long time on passage, having been kept back by contrary wind; and we consider that this supply was the accumulation of several preceding weeks. The total arrival during the month will amount to nearly 130,000 qrs. Importers have manifested no anxiety to press sales from on board ship, and during the dulness in the early part of the month a good many parcels were taken to granary, in anticipation of a revival in the country demand — a step which subsequent events have proved to have been judicious. The demand during the first fortnight was of a strictly local character, and the town millers succeeded on the 17th inst. in purchasing 2s. to 3s. per qr. cheaper than before. Here, however, the downward movement ceased, and that abatement has since been fully recovered. On the 21st and 24th instant, Mark Lane was very numerously attended by buyers from different parts of the kingdom, and a very large quantity altogether was taken off the market. The rise from the lowest point has been greater than the previous temporary depression, and very ordinary qualities of red wheat now bring 60s., whilst fine Baltic sorts may be quoted from 72s. up to 76s. per qr. Danzig, which is more plentiful, is cheaper in proportion, it being difficult to exceed 80s. per qr. for the best high-mixed. We have lately had some slight revival in the export demand, and a few cargoes of hard wheat have been bought for shipment to France. Should the inquiry increase, it would have greater influence than a much larger demand for local consumption would produce. The arrivals off the coast from the Black Sea ports, &c., have been small, as compared with the supplies received earlier in the year, and the free-on-board transactions have not been of much importance this month. The Greek merchants established in London have this branch of business almost entirely in their own hands, and as they appear confident as to higher prices hereafter, they have been unwilling sellers except at high prices. Nearly as much money has been asked, cost and freight, as has been demanded for similar qualities in granary, though the buyer in the first instance has to run the risk of the cargoes arriving in condition, besides paying the 1s. duty, and landing expenses. This, in our opinion, proves that the prevailing feeling inclines to higher rates hereafter. The last sales which have come to our knowledge were at the following rates:—Polish Odessa, 60s.; Taganrog Ghirka, 64s.; Marianopoli and Berdianski, 64s. to 65s. per qr., cost and freight. There are now only two or three cargoes arrived off the coast undisposed of.

The nominal top price of flour remained stationary until the 24th inst., when the millers, anticipating a further rise in the value of wheat, determined to advance the quotation to 75s. per sack. Households had previously been put up 2s. to 3s., and the top for the latter is at present 65s. per sack. Though the arrivals of flour from America have not been by any means heavy, either here or at Liverpool, this article has met with less attention than usual, and at one period some forced sales were made at Liverpool at very low rates, as compared with the prices current for flour of home manufacture. Latterly, however, holders have manifested more confidence, and on Monday last a good business was done at Mark Lane, moderately good brands bringing 38s. to 39s., and fine 40s. to 41s. per brl.

Barley of home growth has come forward sparingly, and, judging from the smallness of the supplies (not alone here, but at most of the provincial markets), it would appear that the yield of this grain has been over-estimated, more especially as the prices current are sufficiently high to hold out a pretty strong inducement to thrash. The best malting qualities have been much sought after, and at Mark Lane 46s. to 48s. per qr. has been realized for the finer descriptions. These rates show an advance of about 2s. per qr. on the terms current at the close of September, and thus far there are no indications of a lower range of prices. Secondary sorts have not moved off quite so freely, but have brought corresponding rates. The importations of foreign barley have scarcely been on a sufficiently liberal scale to keep pace with the de-

mand, and the tendency of prices has continued upwards. The market is at present very bare of good fresh grinding qualities, and it is difficult to give accurate quotations. Very moderate sorts cannot now be had below 33s. to 34s. per qr.

Malt has been influenced by the scarcity and dearness of barley, and superior pale Ware may be quoted 72s. to 74s. per qr. The consumption of this article has been very great, owing to the extensive export demand for ale during the summer. Stocks of old malt are therefore reduced into a narrow compass, and the chances are that prices will rule high throughout the season.

The arrivals of oats coastwise have been exceedingly small, and the supplies from Ireland on a much more moderate scale than calculated on; notwithstanding, therefore, good receipts from abroad —principally from Russia—the total quantity which has come to hand has scarcely sufficed to provide for the consumptive demand, and stocks previously much reduced have been still further diminished. In the early part of the month the tendency of prices was decidedly upwards; but about 40,000 qrs. having come to hand altogether, the week ending 15th inst., a decline of about 1s. per qr. took place the succeeding Monday. This concession on the part of factors induced the dealers to purchase freely, and the market was speedily cleared. Since then a rise of nearly 2s. per qr. has been established, and Archangel oats are now quite as high as they have been at any period this year, very moderate quality being worth 24s., and good 25s. per qr.

English feed may be quoted from 25s. to 30s., Irish from 24s. to 30s., and Scotch up to 32s. for feed, and 35s. per qr. for fine potato.

The arrivals of new English beans have not been large; still prices have rather receded, most of the samples having come to hand in soft condition. Old beans have maintained their value with great firmness, and for Egyptian as much as 40s. per qr. has been realized.

In quotations for grey and maple peas no material change has taken place; but white boilers have fluctuated violently in value: 80s. per qr. was, we believe, in one or two cases paid for superior samples in the early part of the week; then they receded to about 60s., and subsequently again recovered part of the decline, the rates quoted on Monday last being 66s. to 70s. per qr.

The arrivals of Indian corn off the coast have been small, and the offers of floating cargoes on passage not by any means numerous. Very full terms have in general been asked, but the demand has been less active than might have been expected, considering the continued rise in wheat and the increasingly unfavourable reports in regard to potatoes.

There are few arrived cargoes off the coast, and we have heard of no sales for some days past; the price last paid for good Galatz was 40s. per qr., cost and freight.

Prices of grain abroad have, as usual, been in a great measure regulated by the state of affairs here, and the slight reaction which occurred in our markets in the early part of the month led to a corresponding depression at several of the principal Baltic ports; since then, however, holders have again raised their pretensions, and it would scarcely pay to import from that quarter at present, freights and insurances being now very high.

The advices from Danzig and Konigsberg speak very badly of the quality of the new Lower Polish wheat; but in the Upper districts the produce was better reported of. Many of the samples of new which had come forward had been wholly unfit to stand a sea voyage; and we are told that it will not be easy to obtain 60lbs. quality, the weight of the growth of this year running very light, some lots only 53 to 56lbs. per bushel. The stock of old wheat at Danzig had been reduced to 40,000 qrs.

At Stettin, the quantity remaining on hand appears also to have been greatly diminished; and as the deliveries of new from the growers are usually unimportant until after the seeding of the land has been accomplished, we cannot expect further shipments of moment from thence, or, indeed, from any of the Baltic ports, the stocks of old being equally light at Rostock, Anclam, Stralsund, &c., as at Stettin.

From Hamburg we learn that the supplies of wheat had barely sufficed for the local wants, and the receipt of an occasional order from Yorkshire had, therefore, been productive of an immediate enhancement in prices.

The latest accounts from France state that the attempt of the Government to keep down prices by prohibiting a rise by the Paris bakers in the price of bread had failed, and that quotations of wheat and flour were again advancing in all parts of the kingdom. That France will stand in need of foreign aid quite as much as Great Britain does not admit of doubt; indeed the probability is, that we shall from time to time be visited by French buyers whenever our quotations may be a trifle below theirs. Flour is now considerably higher in Paris than in the London market; but the difference in the price of wheat is not sufficient to leave a margin for profit on shipments from hence.

The accounts from the Mediterranean continue to speak of scarcity in the Italian States and in some parts of the south of France; and though large arrivals of Black Sea wheat had taken place at Marseilles, prices had risen in the face of this supply. The latest quotations from thence are—

for Marianopoli wheat 60s. 6d., Ghirka 57s. 7d., Polish Odessa 53s. 3d. to 56s. common, and 57s. 9d. to 59s. per qr. for fine. A very extensive demand had been experienced there from the interior; and it was the prevailing belief that the whole of the supply from the Black Sea ports would be quickly absorbed.

The advices from the Black Sea are at the present time of more than ordinary interest, inasmuch as it is from thence England and France will have the best chance of drawing supplies, provided war does not interfere to prevent the same.

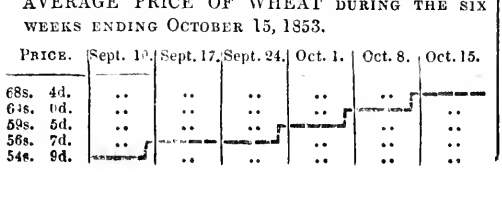
A private letter from Odessa informs us that nearly two millions of quarters of wheat were stored there, and that warehouse-room had become so scarce that it had been found necessary to pile up the grain in sacks in the open air. This accumulation had been caused principally by the great scarcity of shipping, which had prevented the usual exports being made. In one case as much as 25s. per qr. freight had been paid for the United Kingdom, and there were then no disposable vessels at the port. The finer qualities of wheat were then quoted 38s. to 39s., and average sorts 37s. to 38s. per qr. free on board; if to these rates we add, say 20s. per qr. for freight and the present high premiums for insurance, the cost here will stand in more than the article might be bought for in granary.

The advices from Galatz and Ibraila are to much the same effect; the great hindrance to business appears to have been the difficulty of obtaining the means of transit. There had been plenty of orders to buy wheat and Indian corn on British, French, and Italian accounts, but the impossibility to procure vessels had prevented their execution.

From America we learn that the exciting reports from hence had had considerable influence on the markets for wheat and flour on the other side of the Atlantic. Supplies from the interior to the ports on the seaboard had increased, but the expectation of a continued and extensive English demand had sufficed to give an upward movement to prices.

The latest advices from New York inform us that good brands of Western Canal flour were then worth 28s. 3d. to 29s. per brl., free on board; and that the freight to Liverpool was 2s. 9d. to 3s., and to London 3s. to 3s. 3d. per brl.

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING OCTOBER 15, 1853.



CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter				
Wheat, Essex and Kent, white.....	63	to 68	fine	up to	76
Ditto ditto new....	65	68	fine		78
Ditto ditto red.....58	62	61	„		67
Ditto ditto new	61	68	„		71
Norfolk, Lincoln. & Yorksh., red..	59	64	„		67
Barley, malting, new.. 40	42	Chevalier..	43		47
Distilling .. 34	36	Grinding..	32		34
Malt, Essex, Norfolk, and Suffolk, new	65	66	extra		68
Ditto ditto old	64	65	„		66
Kingston, Ware, and town made, new	68	70	„		72
Ditto ditto old	66	68	„		70
Oats, English feed.. 22	25	Potato..	24		28
Scotch feed .. 25	27	Potato..	27		30
Irish feed, white	22	24	fine		28
Ditto, black	21	22	fine		25
Rye.....	34	38	old	—	—
Beans, Mazagan.....	38	39	„	40	41
Ticks.....	39	41	„	42	44
Harrow.....	40	42	„	43	45
Pigeon	40	44	„	45	49
Peas, white boilers 65	68.. Maple 45	48 Grey		40	42
Flour, town made, per sack of 280 lbs.	—	—	„	65	70
Households, Town 50s. 60s. Country		—	„	54	60
Norfolk and Suffolk, ex-ship	—	—	„	52	55

FOREIGN GRAIN.

	Shillings per Quarter				
Wheat, Dantzic, mixed..	63	to 64	high mixed	68	72 extra 76
Konigsberg.....	62	63	„	66	68 „ 71
Rostock, new 68	71	fine		71	„ 73
Pomera., Meckbg., and Uckermk., red	66	67	extra ..		68
Silesian.....	„	64	66 white	66	68
Damsn and Holstein	„	63	64 „	64	65
Rhine and Belgium.....	„	—	— old	—	—
Odessa, St. Petersburg and Riga..	54	56	fine	56	58
Barley, grinding 30	34	Distilling..		34	36
Malting.....			none	—	—
Oats, Dutch, brew, and Polands 26s., 28s..			Feed ..	24	26
Danish & Swedish feed 25s. to 27s.			Stralsund	26	28
Russian..... 23	24	French..		23	25
Beans, Friesland and Holstein				37	40
Konigsberg.. 39	42	Egyptian ..		36	38
Peas, feeding	46	48	fine boilers	49	51
Indian Corn, white.....	37	42	yellow	37	42
Flour, French, per sack (none)	—	—	none	—	—
American, sour per barrel	32	33	sweet	35	40

IMPERIAL AVERAGES.

For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
Sept. 10, 1853..	54	9	31	3	21	11	33	6	41	3	37	8
Sept. 17, 1853..	56	7	34	9	20	6	35	7	41	9	39	8
Sept. 24, 1853..	56	7	35	9	21	4	36	9	43	0	41	6
Oct. 1, 1853..	59	5	37	0	22	2	36	11	42	10	42	11
Oct. 8, 1853..	64	0	38	7	22	9	39	1	44	3	44	4
Oct. 15, 1853..	68	4	40	1	23	10	39	11	45	8	45	4
Aggregate average of last six weeks	59	11	36	3	22	1	37	0	43	2	41	11
Comparative avge. same time last year	39	7	27	6	18	0	30	2	34	1	30	4
Duties.....	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	s.	d.	Friday's Av.	s.	d.	Averages from the corresponding *Gazette* in 1852.	Qrs.	s.	d.	Av.	s.	d.
Wheat....	95,494	..		68	4		Wheat....	114,438	..		37	10	
Barley....	64,450	..		40	1		Barley....	50,957	..		27	8	
Oats	16,298	..		23	10		Oats	18,181	..		18	0	
Rye.....	440	..		39	11		Rye.....	172	..		30	1	
Beans....	3,170	..		45	8		Beans....	5,122	..		34	1	
Peas	1,283	..		45	4		Peas	3,302	..		30	4	

PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.).. sowing 54s. to 58s.; crushing 45s. to 50s.
Linseed Cakes (per ton)..... £8 10s. to £10 0s.
Rapeseed (per last)..... £30 to £32
Ditto Cake (per ton)..... £4 15s. to £5 5s.
Cloverseed (per cwt.)..... (nominal) .... 00s to 00s.
Mustard (perbush.) white new 15s.to 18s., brown old 10s.to 13s.
Coriander (per cwt.)..... new 10s. to 13s., old 10s. to 15s.
Canary (per qr.) ..... 65s. to 70s.
Tares, Winter 7s. 6d. to 8s.0d... Spring, per bush., (none)
Carraway (per cwt.)..... new 42s. to 44s., old 44s. to 48s.
Turnip, white (per bush.)..... Swede (nominal.)..... .
Trefoil (per cwt.) ..... 17s. to 21s.
Cow Grass (per qr.)..... (nominal) .. 00s. to 00s.

FOREIGN SEEDS, &c.

Linseed (per qr.).... Baltic, 43s. to 46s.; Odessa, 45s. to 49s.
Linseed Cake (per ton)..... £8 0s. to £10 0s.
Rape Cake (per ton)..... £4 15s. to £5 0s.
Hempseed, small, (per qr.) 33s.to 35s., Do. Dutch, 37s. to 38s.
Tares (per qr.) .... old, small 30s. to 36s., large 36s. to 42s.
Rye Grass (per qr.) ..... 28s. to 35s.
Coriander (per cwt.)..... 10s. to 13s.
Clover, red (duty 5s. per cwt.) ..... (nominal).. 00s. to 00s.
Ditto, white (duty 5s. per cwt.) .... (nominal).. 00s. to 00s.

HOP MARKET.

BOROUGH, Monday, October 24.

A good trade has been done in all descriptions of Hops during the past week. Fine coloury samples are now becoming scarce, and prices have been fully maintained, at about the annexed quotations:—

	£ s.		£ s.
Mid and East Kents.....	15 0	*to*	20 0
Weald of Kents.....	11 0	„	13 13
Sussex pockets	10 10	„	13 0

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

Monday, Oct. 24.

Since our last report the arrivals of home-grown Potatoes have been but moderate. The imports have amounted to 137 bags from Rotterdam, 18 baskets from Nieu Diep, 680 tons from Rouen, 26 do. from Ostend, and 100 from Antwerp. About an average business is doing on the following terms:—Shaws, 120s. to 140s.; Regents, 150s. to 180s.; Foreign, 160s. to 160s. per ton.

ENGLISH BUTTER MARKET.

Oct. 24.

We note a good fair trade, and prices are maintained. Fresh Butter, which has latterly hung upon hand, now clears off; chiefly owing to families having again returned to town.

Dorset, fine weekly	106s. *to* 108s. *per cwt.*
Do., middling	94s. *to* 98s. „
Devon	98s *to* 100s. „
Fresh, per dozen lbs......	11s. *to* 13s.

BELFAST, (Friday last.)—Butter: Shipping price, 95s. to 102s. per cwt.; firkins and crocks, 10½d. to 10¾d. per lb.; Bacon, 58s. to 60s.; Hams, prime, 74s. per cwt.; mess Pork, 85s. to 87s. 6d. per brl. Irish Lard, in bladders, 66s. to 70s.; kegs or firkins, 64s. per cwt.

Oct.	*Butter. per cwt.*		*Bacon. per cwt.*		*Dried Hams, per cwt.*		*Mess Pork per brl.*	
20.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1849..	82 0	84 0	48 0	50 0	68 0	75 0	76 0	78 0
1850..	68 0	75 0	40 0	46 0	64 0	68 0	60 0	62 0
1851..	75 0	80 0	45 0	47 0	60 0	62 0	58 0	62 0
1852..	72 0	78 0	50 0	56 0	66 0	70 0	85 0	90 0
1853..	94 0	99 0	58 0	60 0	74 0	78 0	85 0	87 6

PRICES OF BUTTER, CHEESE, HAMS, &c.

	s.	s.		s.	s.
Butter, per cwt.			*Cheese, per cwt. Cheshire*	70	*to* 86
Friesland	98	*to* 100	*Cheddar*	72	84
Kiel.....	90	94	*Double Gloucester*	66	74
Dorset.....new	100	106	*Single do.* ..	68	72
Carlow..... „	98	100	*Hams, York, new*....	80	90
Waterford .. „	92	96	*Westmoreland*..	80	86
Cork..... „	94	98	*Irish*	70	76
Limerick.... „	90	94	*Bacon, Wiltshire, green*	66	68
Sligo..... „	90	96	*Waterford*	62	64
Fresh, per doz. 12s.0d.		13s. 0d.			

WOOL MARKETS.

BRITISH WOOL TRADE.

Monday, Oct. 24.

Owing to the restricted accommodation on the part of some of the banking firms, and the heaviness in the demand for colonial wool at the sales now in progress, from which 10,000 bales have been withdrawn, the English wool market is exceedingly depressed, and to effect sales lower prices must be submitted to.

	s.	d.		s.	d.
South Down Hoggets	1	4	*to*	1	6
Half-bred ditto	1	4	—	1	6
Ewes, clothing.....	1	1½	—	1	3½
Kent fleeces.....	1	1	—	1	3
Combing skins.....	1	1	—	1	5
Flannel wool	1	0	—	1	5
Blanket wool	0	8	—	1	0½
Leicester fleeces.....	1	2	—	1	4

LIVERPOOL WOOL MARKET, Oct. 22.

SCOTCH WOOL.—The sales in laid Highland are confined to the immediate wants of the trade at late rates: holders will not give way in price for good wools. White Highland is still scarce, but less inquired for. Crossed and Cheviot are inquired for, but as holders are firm in price there is little doing.

		s.	d.		s	d.
Laid Highland Wool, per 24 lbs.....		13	6	*to*	14	6
White Highland do.....		17	0		18	0
Laid Crossed	*do..unwashed*	18	0		19	0
Do.	*do..washed*	19	0		21	0
Laid Cheviot	*do..unwashed*	20	0		23	0
Do.	*do..washed*	23	0		26	0
White Cheviot	*do* .. .. do	30	0		32	0

FOREIGN WOOL.—The public sales going forward in London, with those advertised to take place here next week, have for the present prevented anything being done by private contract. There will be little of any other sort offered here next week besides 5,000 bales East India.

MANURES.

PRICES CURRENT OF GUANO.

Peruvian Guano	*per ton*	£9	5	0 *to*	£9	10	0
„ *D. first class (damaged)*..	„	8	10	0	0	0	0
Bolivian Guano	„	7	10	0	7	15	0
ARTIFICIAL MANURES, OIL CAKES, &c.							
Peat Charcoal	„	3	0	0	0	0	0
Nitrate Soda	„	17	0	0	17	10	0
Nitrate Potash or Saltpetre.....	„	26	0	0	28	0	0
Sulphate Ammonia	„	15	0	0	16	0	0
Muriate ditto	„	22	0	0	23	0	0
Superphosphate of Lime	„	0	0	0	6	0	0
Soda, Ash or Alkali.....	„	0	0	0	8	0	0
Gypsum	„	1	15	0	3	0	0
Coprolite.....	„	3	0	0	3	10	0
Sulphate of Copper, or Roman Vitriol for Wheat steeping....	„	33	0	0	38	0	0
Salt	„	1	1	0	1	5	0
Bones ½ inch	*per qr.*	0	0	0	0	15	0
„ *Dust*.....	„	0	0	0	0	17	0
Oil Vitriol, concentrated	*per lb.*	0	0	1	0	0	0
„ *Brown*.....	„	0	0	0	0	0	0¾
Rape Cakes.....	*per ton*	6	5	0	6	10	0
Linseed Cakes—							
Thin American in brls. or bags	„	10	15	0	11	5	0
Thick ditto round.....	„	9	15	0	10	0	0
Marseilles	„	10	0	0	10	5	0
English	„	10	5	0	10	10	0

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THE FARMER'S MAGAZINE.

DECEMBER, 1853.

PLATE I.

A GOOD SORT.

THE PROPERTY OF MAJOR HALL, OF SIX-MILE BOTTOM, CAMBRIDGESHIRE.

An interesting and what promises to be a really useful discussion, is now taking place on the subject of breeding horses. Some short time since, a gentleman of great practical authority, who writes under the title of Cecil, published a little work, called THE STUD FARM. This was specially dedicated to the tenant farmers of the United Kingdom, while it had for its particular object the more general production of "a good sort" of horse. It can be scarcely recommended too highly to such of our friends as may now be inclined to turn their attention to this branch of rural occupation. There is little doubt, indeed, but that, with the same care and judgment to act on, the breeding of "a good sort" of nag may be attended with as much certain profit as that achieved by a short-horn heifer, or an Essex pig. Of late years more particularly, we are afraid the agriculturist has not given the breeding of horses anything like a fair trial. There is now, though, some promise of his being induced to do so; and we shall think none the worse of a homestead when we find it furnished like the one in our plate—with a few of the right sort grouped around it.

PLATE II.

A SHORT-HORNED OX.

BRED BY AND THE PROPERTY OF RICHARD STRATTON, ESQ., OF BROAD HINTON.

The subject of our second plate obtained the first prize of twenty-five sovereigns in Class X., and the Gold and Silver Medals, at the last Smithfield Club Cattle Show. This very fine animal was the property of Richard Stratton, Esq., of Broad Hinton, near Swindon, and was purchased at the show by Mr. W. Turner, Sheffield.

THE FARMING NEAR THE LAND'S-END.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

There is much instruction and interest in tracing the geological formations of our island, and the different systems adopted in the cultivation of their soils. These variations are not only caused by the chemical composition of these soils, but by the climate in which they are placed. These facts were strongly forced as it were upon my attention in a recent visit to the farthest western extremity of our island's granite formation in Cornwall; I allude to the parish of Senen, in which the Land's-end is situated. The granite here presents itself in all its wildness and grandeur; bold, rugged rocks and gigantic cliffs abound, such as my readers of the southern and eastern counties of England are totally unused to.

In this picturesque district, everything indeed is of granite—houses, barns, cow-houses, and pigsties, are all formed of large blocks of this stone;

huge fragments of it form the posts of their field-gates, smaller pieces of granite, piled up between these posts, serve as a substitute for gates; larger lumps of it (commonly set upright in the earth) make the only divisions of their fields.

When you get into their fields, the same stone, in large blocks, protrudes from the grass in all directions—rocks which are not only as devoid of all verdure as the pavement of London, but materially impede the operations of the plough. Fortunately, however, for the holders of these fields, they do not often need the plough; the grass which they produce is not only of excellent quality from May till November, but the turf continues good for years. They consider one cow to an acre to be the allowance on their grass fields of medium quality. These cows are generally of the Devon breed, and in excellent condition. From the mildness of the climate they do not require much artificial food in winter; they grow, therefore, only a very limited quantity of turnips and mangel wurzel. About a fifth or a sixth of their farms only are made to produce corn; wheat and barley are their favourite crops. Their wheat is excellent, their barley is ground into flour, and on the bread made of the barley meal (which bread is of a very dark colour) the labouring class subsist.

The farms are small, from 30 to 60 acres being the ordinary size, and some are much smaller than these. It is impossible to view without interest the comfort and quietude of most of these small holdings; all paying, however, good rents for their easily cultivated, and naturally fertile little fields. To give an instance of one of the smallest of these—close by the Land's-end, directly opposite the Long Ships rocks and lighthouse a small streamlet courses over the rugged granite stones at the bottom of a little ravine, and descends at last through the huge granite cliffs into the sea. By the side of this bright stream, in a sheltered corner, amidst the rocks, stands a little farm cottage of four rooms, the most westerly situated house in England; and here, with her son and daughter-in-law dwells the Widow Blackwell, occupying three or four fields, and these containing altogether but some 6 or 7 acres. In this little holding is an instance of what may be done with a very limited portion of land of not the best decription, by care and attention. The widow told her history very cheerfully. She had lived there, it seems, amidst these surrounding wilds, for more than forty years. Everything around her, however rude, from the turf fire, in whose ashes the iron oven was buried, in which the barley bread was baking, to her little parlour, lined with its blue Wedgewood ware, were all neat and clean. And then her cow, grazing so quietly in one of her little mere nooks of grass, seemed in excellent condition, and as contented as its mistress, who assured one of my companions that she was never dull, or wanted a better companion than the sea, for *that* had always something moving on it, and was always cheery. They live chiefly, it seems, on barley bread and fish (which abound here, pilchards, herrings, &c.), and now and then, especially on Sundays, some fresh or salted meat; and I suspect too that they sometimes have a supply of wild fowl, which abound here at certain seasons; and for the more ready killing of these, her son had made a pond, at some distance from the house, on a piece of wild heath land, beside which a small turf-built hut, furnished with loopholes for a gun, gave us a pretty certain assurance that a harvest was often obtainable here. If the much larger farmer, of better cultivated lands and of a drier climate, shall wander to the little farm of Dame Blackwell, I think I can promise him a glass of the soft, bright granite water, and some wholesome turf-baked barley bread, and a modest curtsey from her daughter as he slips into her hand a valedictory piece of silver.

The rotation of crops here is, after a grass ley, 1, turnips; 2, wheat; 3, barley; 4, grass, this last remaining for two, three, or more years. They do not like so well the growing wheat or oats after grass. They say the wheat is not so good on a grass ley as after turnips. They have very few sheep, and these are chiefly kept on the waste heath lands, with their legs tied together to prevent their leaping over the stone fences.

The gradual decomposition of the granite, aided by the moisture and mild temperature of the atmosphere, keeps the soil, however thin or poorly farmed, in a state of very considerable productiveness. The results of that decomposition in slowly forming a soil will be better understood if we first examine the chemical composition of the granite, which is composed of quartz (or silica), felspar, and mica. 100 parts of felspar, according to the analysis of Vauquelen, are composed of—

Silica	62.83
Alumina	17.02
Lime	3.0
Oxide of iron	1.0
Potash	13.0
Loss	3.13

Common mica is composed, according to Klaproth, of—

Silica	47.0
Alumina	2.0
Oxide of iron	15.5
Oxide of manganese	1.75
Potash	14.5
Loss	1.25

Davy, the father of agricultural chemistry, long since thus described the slow formation of a soil by

the gradual action of the atmosphere upon one of the varieties of granite (*Agricultural Chemistry*, p. 189). He observes that when a soft granite or porcelain granite rock has been long exposed to the influence of air and water, the lime and the potassa contained in its constituent parts are acted upon by water or carbonic acid, and the oxide of iron, which is almost always in its least oxidized state, tends to combine with more oxygen: the consequence is, the felspar decomposes, and likewise the mica, but the first the more rapidly. The felspar, which is as it were the cement of the stone, forms a fine clay. The mica partially decomposes, mixes with it as sand, and the undecomposed quartz appears as gravel or sand, of different degrees of fineness. As soon as the smallest layer of earth is formed on the surface of a rock, the seed of lichens, mosses, and other imperfect vegetables (which are constantly floating in the atmosphere, and which have made it their resting place), begin to vegetate. Their death, decomposition, and decay afford a certain quantity of organizable matter, which mixes with the earthy materials of the rock. In this improved soil more perfect plants are capable of subsisting; these, in their turn, absorb nourishment from water and the atmosphere, and after perishing afford new materials to those already provided. The decomposition of the rock still continues, and at length, by such slow and gradual processes, a soil is formed in which even forest trees can fix their roots, and which is fitted to reward the labour of the cultivator.

The shallow nature of the soil and of its subsoil render (as Dr. Paris well remarked) a copious supply of moisture indispensable. There is a popular Cornish adage, indeed, that the land of Cornwall will bear a shower every day and two upon a Sunday; and here (added Dr. Paris) we cannot avoid admiring the beautiful contrivance of Nature in connecting the wants and necessities of the different parts of the creation with the power and means of supplying them. Thus, in rocky countries like Cornwall, where the soil is necessarily greedy of moisture, the very cause which creates this want is of itself capable of supplying it; for the rocks, elevated above the surface, solicit a tribute from every passing shower; while in alluvial and champagne countries, where the soil is deep and rich, and consequently requires less moisture, the clouds floats undisturbed over the plains, and the country frequently enjoys that long and uninterrupted series of dry weather which is so congenial to it. As a general rule, it is to be noted that as the proportion of silica increases in soils, the greater is the proportion of moisture which they require to produce the greatest amount of fertility. Dr. Paris found some of the most productive corn lands in the parish of St. Burian (in whose deanery the parish of Senen is included) to contain as much as 70 per cent. of silica.

It is on the coast around the Land's-end that the pilchard fishery is carried on; the abundance of these oily fish, the huge draughts of them which are commonly caught in their large nets, the large piles of them which, in alternate layers of salt, are seen in their curing-houses, are matters full of interest. It is from these great heaps of salted fish that the farmers obtain so much of that refuse salt, now so much employed as a manure. This salt, from the quantity of oil which drains through the salt from these large fish-heaps into little channels leading into small tanks—contains a considerable proportion of the heavy yellow pilchard oil, the scales of the fish, &c.

I may hereafter again revert to these little notices of a remote, wild, and highly interesting district, and endeavour to add my mite to the great effort to view the agriculture of a district in connection with its geological formation. It is highly gratifying to witness many other recent attempts of a similar nature; thus, as I have had occasion to remark in another place (*Farmers' Almanack and Calendar* for 1854, p. 35), more than one paper has been published during the past year upon the connection between geology and agriculture. Professor J. F. Johnson has addressed himself to the subject of their relations in North Eastern America (*Jour. R. A. S.*, vol. xiv., p. 1). He thus sums up the results:—1. That the agricultural value of the soil in a district may differ very much from that which pure geology would indicate. 2. That the physical structure of a country has much influence in causing diversities of soil upon or from the debris of rocks of the same age and kind. 3. That the existence of flat table lands, for example, or of depressions having no natural outlet, will cover extensive portions of such a surface with swamps and bogs, in climates such as that of Ireland or New Brunswick, which favour the accumulation of vegetable matter. 4. That generally speaking, the soil of a district of uniform geological character will improve in the direction of the natural drainage and river outfalls; for where rains fall and snows melt, it is the tendency of the flowing water to enrich the lower at the expense of the higher country, and thus to establish differences of soil which did not originally exist. 5. That the passage of rivers or of sea arms across a poor country, after it has previously traversed a richer geological region, is sure to a greater or less extent to modify, to increase, in fact, the value of the surface in the line of its course. 6. That partial elevations of the land at successive periods will aid other physical causes in establishing such differences. The average

produce of grain, &c., in New Brunswick, is, according to Professor Johnston, more considerable than in some of the best districts of the United States and West Canada. The following table gives in bushels per acre, I., the average produce of New Brunswick; II., of New York; III., of Ohio; IV., of West Canada—

	I.	II.	III.	IV.
Wheat	18	14	15½	13
Barley	27	16	24	17½
Oats.....	33	26	34	25
Buckwheat	28	14	20	16
Rye	18	9½	16	11½
Indian Corn ..	86	25	41	—
Potatoes	204	90	69	84
Turnips	390	88	—	—

The average produce of all partially cultivated countries is indeed much lower than might reasonably be anticipated from the natural riches of the soil. This remark applies to even the extensive and naturally rich soil known as the black earth of Russia; the produce from this, it was calculated by the late Mr. Rham, varies from 30 to 45 bushels of wheat per acre (*ibid*, vol. iii., p. 130.)

In the 14th volume of the same journal, p. 96, will be found a useful paper, by Mr. Trimmer, on the geology of the Keythorpe estate, in Leicestershire; and at p. 225 another, by Messrs. J. T. Way and J. M. Paine, on the silica strata of the lower chalk. These seem to afford very considerable facilities for the preparation, for the purposes of manure, of the soluble silicates—a class of salts from the use of which I anticipate very considerable benefits will hereafter arise to agriculture. I quite agree with these gentlemen when they remark that the question of the use of soluble silicates as manure is by no means settled. Hitherto the silicates of soda and potash have been those tried as a manure; now the silica of the Farnboro' rocks happily can be made to unite with lime in several ways, and with the greatest ease, and when formed with the proper precautions, the silicate of lime is soluble in water—not, it is true to a great extent, but sufficiently so, it is believed, for all the purposes of manure; and as the silica is the chief ingredient required by cereal crops, lime is a much cheaper base for the silica than either the potash or soda. The simple silicate of lime, as these gentlemen well remark, must not be confounded with the compound from silicate of lime and alumina: this latter actually separates and renders insoluble the ammonia of manure. Silicate of lime will not do this, and it cannot be looked to as a means of making light land more *retentive* of manure; but if, as we hope, it should be found to render the use of nitrogenous manures, such as guano, &c., more safe on light land, and should facilitate the growth of large crops on such lands by the use of abundance of manure, a great advantage would be obtained for the agriculture of this country. I think, therefore, that silicate of lime is well worth trying as a means of brightening and strengthening the straw of cereal crops on light land, and of checking the over-luxuriance due to high manuring. These conclusions are supported by an experiment by Mr. Paine upon some wheat on a gravelly soil resting upon the lower green sand.

These investigations will well repay the young farmer's careful consideration: they form one of the many steps connected with the science of agriculture—steps which I trust will ere long lead, not only to the acquisition of knowledge, but of comfort to the farmer, and every member of the numerous family more immediately connected with the cultivation of the soil.

ON THE RELATIONS OF GEOLOGY TO AGRICULTURE.

Professor Johnston's paper in the last number of the *Journal of the Royal Agricultural Society*—on the relations between geological structure and agricultural capability—has reference to the British Province of New Brunswick, and is a continuation of the same subject illustrated in a former number by a description of the Atlantic border of the United States and the interior of New York.

New Brunswick contains eighteen millions of acres, much of it still covered with forests, and no small portion unexplored even by the lumberer. Its rocks are chiefly those of the coal-series, bounded on the north by a belt of granite and the older metamorphic or altered slate rocks, which runs from N.E. to S.W. across the whole province. On the S. and W., again, there is a similar belt of slate rocks altered by masses of intrusive trap. The coal field is situated in the centre, and occupies one-half of the whole province.

Professor Johnston first shows how the composition of the rocks defines the general agricultural characters of different districts; and then how these general characters are modified in detail by circumstances—that is, by the contour or form of the surface, and by superficial accumulations which are dependent thereon.

The extensive coal field is selected as a striking instance of the close relation subsisting between geological structure and agricultural capability. Consisting principally of sandstones, in which the

siliceous matter is held together by only a small proportion of clay, chiefly decayed felspar, they crumble readily, and yield pale-coloured light soils, little retentive of water, and therefore easily worked at all seasons; but hungry, devourers of manure, liable to be burned in times of drought, and ill-adapted for grass land. There are some beds which contain more clay, and produce stronger soils; and there are some which, though grey internally, weather of a red colour, and form reddish soils; but lightness of texture and paleness of colour are the pervading characteristics. There is a general absence of those beds of dark-coloured shale, usually of great thickness, which prevail in the British coal measures, and produce cold and dark-coloured poor clays—those clays, in conjunction with the poor siliceous and rocky soils of the associated sandstones, stamping want of fertility on the coal districts of England and Scotland.

The general characters of the New Brunswick coal field are modified by physical conformation in a manner which will be adverted to hereafter. Professor Johnston, therefore, concludes that geological age, chemical composition, and physical conformation, in reality conspire almost equally to produce the general agricultural character of the central region of New Brunswick. He instances other parts of the province, however, as presenting examples of the most striking and immediate dependence upon geological structure alone.

On the edge of the central coal field, red sandstones, and red conglomerates, arise from beneath it, associated with limestones, marls, and gypsum, which produce soils remarkable for their fertility, amidst scenery the most picturesque. The rock and the soil accompany each other in such a manner, he says, that the most sceptical is compelled to admit that the change in the forest trees, the character of the soil, and the nature of the rock, is simultaneous and connected.

These views are illustrated by a section, commencing with the trap and altered rocks which bound the coal field towards the south. These are characterized by scanty soils and gloomy pine barrens, rarely relieved by the enlivening presence of the beech, the oak, and the maple. The rounded hills of red conglomerate, which succeed, remind the English traveller of the old red sandstone of Monmouthshire, the southern part of Sutherland, and the borders of the Cheviots. The forests consist of broad-leaved trees; and the free open soils, sometimes too gravelly on the conglomerates, are adapted to the growth of turnips, barley, and maize.

To the red conglomerates succeed, first, a blue limestone; and, secondly, red marls with gypsum. These constitute wheat soils; though those on the limestone, like the generality of soils on our carboniferous limestone, are thin, with occasional patches of rock. The butternut (Juglans cinera), so called from its large oily nut, and which appears to affect calcareous soils, flourishes on these rocks in their unreclaimed state, and is reputed in the colony an infallible sign of good wheat land. The whole are surmounted by the coal measures, before described as yielding inferior soils, on which, in their forest state, pines are the prevailing trees. The general result is, that wherever one of these three rocks, the red conglomerate, the blue limestone, or the red marl, comes to the surface, there good land and broad-leaved trees abound; and the most flourishing and best peopled settlements in the southern part of the province are usually situated on these rocks.

There is one point not noticed by Professor Johnston, to which we must draw attention, as showing mineral composition to be of more importance than geological age or position in the series. The red rocks above mentioned, which remind the English traveller of the old red sandstone of Britain, and which, from their associated red gypsiferous marls, were at one time mistaken for the new red, are parts of the coal series. Dawson, Logan, and Lyell, who have successively examined this part of the series in North America, are unanimous on that point. They divide the coal series into three groups. The grey siliceous sandstones, before mentioned, form its upper part; the productive coal measures are in the middle; and the limestones, red conglomerates, and gypseous marls are at the base. Thus the mineral characters which in one country characterise one part of the series are found in rocks of a different geological age in another country; but that mineral composition which yields fertile or barren soils in one case produces the same kind of soils in another, subject to some modification from difference of climate.

Of course, in a survey so general as Professor Johnston's survey of New Brunswick, ordinary characters only can be indicated. Had it extended to greater detail, we have no doubt he would have found in America, as it is in England, that within every agricultural district, as defined by the mineral characters of the rock on which it rests, there are variations of soil from the best to the worst, which arise partly from the varying mineral characters of the subordinate members of the formation, and partly from modifications caused by the superficial accumulations. Knowing how much the erratic deposits prevail in Canada and the United States, we have been somewhat surprised to find no mention of them in an account of the geology of New Brunswick.

We shall now proceed to the consideration of that

part of the paper which treats of the influence of physical configuration in modifying the agricultural characters of the coal district, which are due to the composition of its rocks.

In the first part of Professor Johnston's essay on the relations of geology to agriculture, noticed above, he showed that the value of the soil over very large areas is determined, in many cases, directly by the nature of the rocks below; and sometimes by the mere geological epoch to which they belong. The second part points out how, in the case of the coal region of New Brunswick, the natural quality of the soil, derived from the rocks, is modified by the physical geography or configuration of the surface. The time, he says, appears now to have arrived, when the influence of circumstances, in producing such modifications on the agricultural indications of general geology, ought to obtain a more prominent place in systematic works.

The modifying conditions in this instance are, he tells us, flatness of surface, and the impervious character of the thin bedded strata, which have produced bogs, swamps, and carriboo plains—the last open barrens, generally dry, with only rare trees, but sometimes wet, and covered sparingly with stunted pines and alders.

These views are illustrated by an agricultural map, founded on the author's own observations during his tour, combined with the greater part of the knowledge which had previously been obtained during the numerous surveys made under the direction of the surveyor-general, by order of the provincial government. On this map the variations of soil are shown by colours in the original—by different kinds of shading in the reduced map published in the Journal of the Agricultural Society. The soils are classified according to the crop of hay which they were capable of producing in their natural state. We have thus four qualities, yielding respectively $2\frac{1}{2}$ tons, 2 tons, $1\frac{1}{2}$ ton, and 1 ton per acre. Inferior to these are a fifth and sixth class, the former covered for the most part with narrow-leaved timber, and considered, in its present condition, incapable of profitable cultivation; the latter is composed of the bogs, swamps, and carriboo plains scattered over this incapable soil.

The soils of the first and second quality are grouped under one colour, in consequence of their small extent. They are, in fact, alluvial flats deposited by existing rivers under existing conditions. With respect to the other qualities, the strike or range of the rocks is N.E. and S.W.; the variations of soil, however, do not range in that direction, but follow the lines of drainage.

It would appear, therefore, at first sight, says Professor Johnston, as if there were no accordance whatever between the indications of geology, taken alone, and the observed qualities of the soil, as represented in this map. A little examination, however, removes this impression, while, at the same time, it shows how other causes operate in modifying purely geological influences, what those causes are, and to what extent they operate.

He then argues that as soils of the first and second quality only occur in a few places, and of limited extent, it is therefore generally true of the whole area, that rocks of the coal measures are covered by soils of inferior quality; and secondly, that as the worst soils are near the sources of the rivers, the cause of their sterility is that the rains of summer and the snows of winter, impoverish them by washing away their more fertile constituents, their soluble portions, and their finer insoluble particles.

These soils on the watersheds between the different river systems of the country, being regarded as representing in some degree the natural quality which the soil derives from the rock immediately below, it is remarked of the richer soils, number 3, that they lie in general along the lines of drainage, and towards the outfalls of the rivers. The map, however, shows them extending up the lines of the rivers to a considerable distance from their outfalls. It is therefore inferred that the same atmospheric agencies which have robbed the higher have enriched the lower lands, and have thus established on rocks of the same geological structure, and of the same chemical composition, diversities of soil which a knowledge of geological structure alone would not lead us to anticipate, and for which it will not enable us to account. It is admitted that here and there such richer soils occur in places which existing rivers appear unable to reach; but this is considered as only proving how imperfect our information still is, in regard to the actual condition of this new country, to the modifying causes now in operation in different localities, and how still more imperfect is our acquaintance with the earlier history of the surface of New Brunswick, and with the numerous physical alterations by which the influence of the streams upon the country which they traverse must have been very much modified.

It is very truly remarked that the same dependence of the variations of soil on lines of drainage has been observed in the long inhabited and long cultivated countries of Europe; and it is there we conceive, rather than in countries covered with forests, and so little explored as this, that the question of the relations of the soil to the rocks must be solved. Whether those variations depend on the composition of the rocks which are exhibited on our geological maps, or are dependent on the

superficial deposits of which these maps take no notice—they are equally the object of geological research. That research, however, must include the geology of the surface, as well as that of the substrata, which are called by Professor Johnston, general geology and geology taken alone.

The conclusions which we draw from the map and descriptions of the soils of New Brunswick are the same which we have repeated more than once respecting the soils of these islands, and which we have adopted from papers on the geology of Norfolk and of England and Wales, in the Journal of the Royal Agricultural Society. Those conclusions are that while the rock formations define by their mineral character the general agricultural features of a district, the superficial accumulations produce the numerous diversities of soil which are found in each such district; that those superficial accumulations again are of two kinds—first the erratic deposits of undoubted marine origin, which contain much matter transported from great distances, irrespectively of the present lines of drainage; and secondly, a class of deposits of still more recent origin, which exhibit a minor degree of transporting power, along the existing lines of drainage, but quite independent of existing levels. These deposits, for which we use the name of warp-drift, are quite distinct from river terraces, due to movements of elevation, and they are spread over table-lands and hill sides, as well as in the bottoms of valleys. They vary, however, in depth with the elevation and form of the surface, being the thinnest on summits and steep escarpments, deeper on long slopes and in the bottoms of valleys, and deepest of all in the lower parts of the valleys as they approach the sea. This difference in depth produces soils of different values, the composition remaining the same. These deposits again are found both in districts covered more or less with the erratic tertiaries, and in districts from which those marine deposits are absent. They are not marine; for they contain exclusively land-shells and the extinct mammals of the land. We know nothing at present respecting the causes which produced them, except that it could not have been ordinary atmospheric action.

Further information respecting these anomalous deposits, which are only beginning to attract the attention of geologists, will be found in Sir Roderick Murchison's paper on "The Angular Flint Drift of the South-eastern Counties," in the Journal of the Geological Society for last August, and in a paper by another writer "On the Origin of the Soils which cover the Chalk of Kent" in the number of the same journal just published. While then we cannot concur with Professor Johnston in generally ascribing the distribution of soils, different from the rock on which they rest, along the lines of drainage, to existing atmospheric action, that is, the washing of rain and snow, we yield unqualified assent to the existence of the necessity asserted by him for making the specialities of each country the subject of critical study and examination, in order to solve the problem of the extent to which the influence of the rock upon the soil has been modified by other agencies. Of this, he justly observes, that like all other advanced inquiries, it is more complicated and difficult than the simple problem of the direct relation between the character and epoch of the rock and the quality of the soil which it produces when broken up; but that it will result in furnishing us with special surface maps, which will be of direct and immediate use to practical agriculture, while they will solve many interesting questions both in agricultural and geological theory.

MR. PUSEY'S LETTER ON AGRICULTURAL STATISTICS.

It is gratifying to find the letter of Lord Ashburton confirmed by so able and so well-known an authority as Mr. Pusey—the President of the Royal Agricultural Society so heartily adopting the views of his predecessor in office. Such support, too, may not be altogether out of place; particularly, when we come to reflect that the subject to which it is given is one that does not promise to make its way without some little difficulty. There are many of those whose aid is asked, who have yet to be convinced that such assistance could at all tend to their own good. On such, the address of Lord Ashburton could scarcely have its full effect. They might give his Lordship credit for the best intentions, at the same time they might question whether he really understood their case sufficiently well to thus advise upon it. They would naturally enough, perhaps, want the opinion of some one who knew them better—or rather, with whom they themselves were more intimately associated. They have him in Mr. Pusey; a gentleman who has devoted his whole energies to the cause, and who should know, if any can, the true wants of agriculture, and the proper position of the working-farmers. Under his auspices these might be able to consider my Lord Ashburton's letter in a tangible and practical point of view; fully confident that they would so find it toned down from anything of that extravagance, the enthusiasm of the writer might have prompted him to suggest.

We may then very safely take this second letter —Mr. Pusey's—as some safeguard in our reception of any form-paper seeking returns of agricultural produce. We will assume him to be the best agricultural authority in England, as indeed his position warrants us in doing. We will read what others say as to the policy of these agricultural statistics under his eye. *Festina lentè.* He will not let us travel too fast, but tone all down to a becoming degree of the useful and the possible. Lord Ashburton may have spoken with some warmth in favour of the collection of these statistics. Fortunately we have the opportunity of correcting his Lordship by Mr. Pusey. And thus it is. Where one is warm, the other is enthusiastic. Where my Lord prays for an opening, his commentator or follower insists on a completion. The former argued with some strength against an unfavourable impression that had manifested itself. Mr. Pusey does not deign to notice it: he takes it at once as admitted that agricultural returns must be of service, and gives the full force of his experience to render them as perfect and as serviceable as they should be.

Lord Ashburton's letter, it will be remembered, touched only on the land in cultivation, and the amount of corn annually produced. Mr. Pusey feels that this alone could not be sufficient. It is one of the great features of modern agriculture to bring this corn crop to the table of the consumer in more ways than one. In fact, according to our authority, it appears easier to return it otherwise than as the mere loaf of bread:—

"Our object, then, being to record the increasing production of corn and of meat, the accurate estimate of our corn will, I fear, be difficult, as well from the uncertainty of seasons, as also from the uncertainty which must affect the farmer's own judgment, not only while his crops stand in the field, but even while, though safe in the rick, they have not yet been subjected to the test of the thrashing-machine. The enumeration of our live stock, on the other hand, will be very easy, and the advantage of that facility is the greater, because this tangible fact will afford, in the long run, an unerring clue to the more obscure problem, the increased fertility of our soil. I mean that if, since the year 1800, the flock of sheep, for instance, on one of your up-lying Hampshire farms, has been raised from 300 to 600 head, no practical man could doubt that, by the new supply of manure, the average growth of corn will have been augmented in some definite proportion through a more liberal application of capital, which of course, however, will require also a more liberal return of profits as the share of the tenant-farmer."

What "the progressive energy" of this tenant-farmer has already accomplished is famously told. While he has so good an historian, there may be some cause, perhaps, for his hesitating to become his own:—

"At the opening of the century, in other words, when you and I were boys, you will remember that five-year-old mutton was thought right and proper for a gentleman's table. If we could learn the truth, I apprehend we should now find that many a saddle has not surpassed one-fifth of that age. In fact, every year mutton is growing younger. What, then, will have been the real increase of production on a farm that maintained, in 1800, 300 sheep, and in 1850, 600 sheep? When George III. was King the flock of 300 might consist of 50 ewes, and of their progeny, five sets of 50 sheep, advancing through five winters upon hard keep to respectable but tardy maturity—50 sheep only being draughted off each year to market. But in these better days the flock of 600 sends, perhaps, not 100, but 300 fat sheep every March up to Smithfield. The increase, therefore, is not twofold, but sixfold. Besides, as we know that it is fatting stock, especially forced stock, which strengthens the productive powers of the land, the action of the stock upon the crop will likewise have been far more than doubled."

We necessarily proceed from this to the manner in which the stock-tables should be drawn out. Lord Ashburton assured us that the Government had no intention of turning corn-dealer. Mr. Pusey, although he does not stay to say so, is as clearly of opinion that we have nothing to fear from a Prime Minister taking to cattle-jobbing, or increasing his revenue by his business as a salesman. Were it not especially offered to the consideration of a Hampshire Union, we might pause over the "inquisitorial character" of such a return as this:—

"It would clearly be desirable that we should at least distinguish between the females intended for breeding on the one hand, and the remainder of the flock on the other; and, again, that among this remainder there should be a distinction between those which are and those which are not being prepared for the butcher. A minute registration of age, however interesting, might be too troublesome, while this triple classification of breeding, store, and fatting stock, though easily made, must afford very important results to those who may examine 10 or 20 years hence the progress of our different counties."

But Mr. Pusey would even ask something further still:—

"The excellence of our leading breeds of animals is now fully recognized. But, though they are paid for so highly and exported so widely by foreigners, we do not know how far they have succeeded at home in displacing our own unimproved breeds. I would, therefore, strongly recommend a column in which the name of the breed should be entered. The advantage of such a record would not be confined, I believe, to the breeds distinguished by prizes at our public shows. Besides these aristocratic families, there are doubtless other races of plainer features but great intrinsic excellence (your own Hampshire downs are a case in point), which might thus become better known and more justly valued. In short, we want such a map of the distribution of our breeds of stock as ethnography has given us on a larger scale for the migrations of the human race."

Admirably put as this is, we question very much whether, at starting, statistics of so comprehensive a kind would not be far more difficult to obtain, as less to be relied on, than the corn-produce returns of which Mr. Pusey, on the other hand, would fear the accuracy.

Mr. Pusey's grand object here—as, indeed, it has been of his whole life—is "the facts of English agriculture"—"the record and measure of that improvement which began with the present century, and is strengthening with its advance." In seeking this, he is still fighting the battle of the tenant-farmer. In no way has he been, or is the latter still so much maligned, as with regard to that advance in his business he has really made. Both the gentlemen, whose letters we have had the pleasure to dilate on, point out to a means by which he may be better understood. Let him be not the last to clear up his own character, or to claim "that position he is entitled to hold among the husbandmen of all nations."

Thus well advised, we shall look with some interest to the proceedings of the Statistical Committee of the Alresford Union.

HOW SHALL WE DISPOSE OF THE REFUSE OF OUR TOWNS?

How shall we dispose of the refuse of our towns? This is a question of equal importance to the urban population and the agricultural interest. The object of the towns is to remove, at the cheapest rate, and without injury to others, that mass of filth which, accumulating around the habitations of their populations, forms a prolific source of disease. Agriculture calls on the chemist and engineer to solve for her the question how this refuse may be best applied to the fertilizing of the soil. This, again, involves the question whether the nuisance from which it is desirable that the towns should be relieved may not be converted into a source of profit to the inhabitants, as well as to the owners and cultivators of the land, or at any rate whether it may not be made to bear a portion of the expense of those sanitary improvements which are so much needed. We are indebted to Mr. Chadwick and others for the unwearied zeal and indomitable perseverance, through evil report and good report, with which they have laboured, at length successfully, in directing public attention to this necessity.

Until the principles of the Central Board of Health began to be reduced to practice, the only method for the disposal of town refuse was the collection of the soil in cesspools, and its removal in carts. Under the system of the Board of Health all exuviæ removable in water are to be washed into the sewers; and if no other mode of disposing of them can be devised, they are to be treated as the generality of farmers now treat the most valuable part of their manure heaps—they are to be turned into the nearest stream! Thus, while British agriculture is loudly demanding a removal of the guano monopoly, and offering prizes for new and cheaper manures, it will be deprived of a large portion of that manure which it at present obtains from the towns. All our rivers, from their sources till they reach their estuaries, will, in the mean time, be contaminated with an increasing mass of filth, of the most disgusting character; and the result of sanitary improvement in the towns will be the transfer of the seeds of pestilence from them to the rural districts. The improvement will thus be similar to that proposed by the humane gentleman who suggested the substitution of two ducks for the live goose which was formerly dragged up the chimney in Ireland, for the purpose of sweeping it. A large proportion of our towns are now under the operation of the Health of Towns Act. In some the works are completed: in many they are approaching completion. At Tottenham and Rugby, they have given general satisfaction: at Croydon they must be regarded as a failure. The works for supplying Croydon with water commenced in the autumn of 1850; those for the sewers in the summer of 1851. In the summer of 1852 they were nearly completed, and all the mains to the outfalls entirely so, throwing almost two-thirds of the sullage of a town containing 18,000 inhabitants into the Wandle, and irrigating seventeen acres of meadow upon the open-channel system, in the immediate vicinity of the town.

In August, 1852, a fever of a very fatal character broke out in Croydon. The opponents of sanitary reform attributed it to the new works: the advocates of the system ascribed the disease to the unusual wetness of the season, asserting that it made its first appearance in villages at a distance from Croydon, in which no sanitary measures had been enforced, and which could not be affected by the works at that town.

In February, 1852, Lord Palmerston, as Secretary of State for the Home Department, instructed that distinguished philanthropist Dr. Arnott, and Mr. Page, C.E., to institute an inquiry for the purpose of ascertaining whether there were any grounds for supposing that the fever which had prevailed for some months, and was still prevailing, had any, and what, connection with the recently constructed works. The report of Dr. Arnott, containing a great deal that is valuable upon the subject, is certainly a very interesting and instructive lecture on chemistry, and on the effects of certain gases in producing disease. It

attributes the outbreak of fever at Croydon to local malaria, arising from the new sewers and drains, and from other operations connected with the transition from the old to the new system. The preponderance of the evidence is to the same effect. Mr. Page's report is directed to the engineering part of the question, as well as to the evidence which connects the fever with the new works. It contains much valuable matter, worthy the serious attention of all interested in the effective drainage of towns. We could have wished, however, that it had exhibited less of personal feeling against the Central Board of Health, or some individual connected with it. We could have wished also that Mr. Page had been placed in a position to investigate in detail the cause of the success of the general principles of that Board at Rugby and Tottenham, as compared with their failure at Croydon. The conviction which the report has produced on us, connected with all we have seen and heard at Rugby, is that the difference has arisen from difference in the execution of details under local management. The present unsatisfactory sanitary condition of Croydon appears to arise, according to Mr. Page's report, from two causes—defects in the plan and execution of the sewers and house drains, and deficient provision for ridding the town of the sullage, when collected to a general outfall.

Mr. Page appears to be a decided opponent to the use of pipes for sewers and drains, except under certain limitations as to size, length, and gradient, which have not been adopted at Croydon. Into this part of the inquiry we shall not follow him. The point to which we wish to direct attention is the method by which the refuse, when washed into the sewers, whatever their construction, and collected to one outfall, may be most effectively rendered available for the land, without producing greater evils than those which the improved system aims at removing.

At Rugby and Croydon, the collected sullage is discharged into streams of nearly equal size. In each it is creating a nuisance by the pollution of the water below the town: at Croydon, the illegality of such pollution has been ascertained, and a compromise has taken place between the Local Board and the complainants, the former undertaking to adopt measures for the removal of the nuisance: at Rugby, the evil is endured, as being only temporary, because means for a different disposal of the sullage are actually in progress; a neighbouring landowner having taken a lease of it, and having constructed works, now nearly completed, for its distribution by means of the steam engine and pipes laid under the land.

This plan was first adopted by the Rev. Mr. Huxtable, with respect to the liquid manure of the farm. It has been employed with success for some years, by Mr. Kennedy of Myre-mills, with respect to whole manure of the farm, reduced to the liquid state by a large addition of water. The Myre-mills plan has been more recently taken up by Mr. Mechi at Tiptree, and successfully, as we can testify from personal observation. Several other landowners and large farmers are so satisfied with the plan, that they are making preparations for trying the experiment on a large scale.

Mr. Page is opposed to the employment of the sullage of towns in this way, and gives the preference to chemical processes for precipitating and deodorising. On this point we are at issue with him; and we have high chemical authority on our side. The consideration of his views, however, and our reasons for dissenting from them, must be deferred to a future article.

THE POINTS FOR JUDGING FAT CATTLE.

The eye and the touch are the principal channels of conveying the impressions of external objects to the human mind, where, in the laboratory of the judgment, the estimation is strictly canvassed, and the quality and value are duly settled and finally established. Of all senses the visual organ enjoys the widest range and the greatest capacity, along with the most independent power of forming conceptions and establishing conclusions. A very large part of natural objects does not allow any other application by which to judge the appearance, and also the quality and value; the substance is not tangible, and the nature is beyond the reach of a real impression. The judgment of the eye can only be obtained in these cases, and false representations are more apt to be received by that single medium than when one or more sensations are combined. In a very considerable number of cases, the eye is very much assisted by an adjunct or adjective, in the form of another sense which succeeds the visual impression, and by its power of discrimination supports or rejects the evidence which the eye has conveyed. Thus the touch, taste, and smell are applied to the objects which the eye has beheld, in order to judge by their verdict what qualities there may be in the materials to suit a certain purpose beyond the external appearance that has been presented to the visual organ. These judges are superior to the sight, in deciding the quality and value of very many physical productions.

A fattened animal is a material object which has been brought into a certain condition by artificial means, in order to suit a purpose of very excellent utility. When

the eye contemplates the production, it examines if the external conformation agrees with the most enlightened understandings on the different points of animal symmetry, and if the greater number of points constitute an excellence that is beyond the ordinary number of objects of that special kind of Nature's works. The visual examination will next ascertain if the fattening of the animal seems to be amply developed on the chief points of utility, and if the quantity of external exhibition appears to be sufficient upon a carcase of the dimensions that are shown. These outward appearances being settled, the touch of the points of the fingers is applied to the points of prominence, in order to ascertain if the muscular fibre has been rendered fine and silky by the inspissated secretion of fat, and the skin become gelatinous by the same process of amelioration. The skin and the flesh only can be examined by the points of the fingers, if the bones are well covered with flesh, and if the latter is soft to the touch and ample in the quantity on the examined points. The digital grasp is then applied in the handful of the exterior flesh, which constitues a very large addition to the touch of the fingers in judging the quantity and quality of the fattened flesh that lies on the part that is caught in the hand. The squeeze of the palm of the hand is not so delicate as of the points of the fingers—the sensation is more gross; the former ascertains the quantity, while the latter judges the quality in the utmost possible nicety. In judging such objects, it may be doubtful if the eye or the touch are most useful: both are essential and indispensable; and without the most enlightened use of both properties, no correct judgment ever will be formed. The eye may be quick, but not sure of the just observation; it may be sluggish and dull, and never at all perceive the points that must constitute the opinion. Quickness of perception and rapidity of judgment are but very seldom combined in the same human organization; the extremes are seldom united, or even approached, in the mind of human beings. The most casual observation can admire the beautiful outline of the animal figure, the tint of its colours, the plumpness and glossiness of the skin. The gentle and complacent expression of the countenance may give much delight, as also the high condition and general symmetry. The eye alone can judge all these properties, which are but a limited view, and form only a few of the qualities. The hand, on touching the animals, feels the softness of the body occasioned by the fatness of the flesh, and also the quantity of it laid on the most approved places, and the parts that are last in being covered. But the hand, or touch, can feel hidden properties, as it is of all tests the most surely indicative of fine quality of flesh, and of disposition to fatten. It can feel whether the flesh be of the most valuable kind, and it can foretell the probable abundance of fat in the interior of the carcase. A judge should discriminate between the relative values of the different points, and appreciate the aggregate values of all points of an ox. The parts by which the beast is judged are called "points"; these points in fat and lean cattle are to be described.

The form of the carcase is the chief point in the shape of an ox. It is found, the nearer the section of the carcase of a fat ox, taken longitudinally vertical, transversely vertical, and horizontally, approaches to the figure of a parallelogram, the greater quantity of flesh will it carry within the same measurement. That the carcase may fill up the parallelogram, as well as its rounded figure is capable of filling up a right-angled figure, it should possess the following configuration: the back should be straight from the top of the shoulder to the tail, and better if the straight line extends over the shoulder to the root of the horns; the tail should fall perpendicularly from the line of the back; the buttocks and twist should be well filled out; the brisket should project to a line dropped from the middle of the neck; the belly should be straight longitudinally and round laterally, and filled at the flanks; the ribs should be round, and should project horizontally and at right-angles to the back; the hooks should be wide and flat, and the rump from the tail to the hooks should also be fat and well filled; the quarter from the aitch-bone to the hock should be long; the loin-bones should be long, broad, flat, and well filled, but the space between the hooks and the short-ribs should be rather short, and well arched over with a thickness of beef between the hooks; a long hollow from the hooks to the short-ribs indicates a weak constitution and an indifferent thriver; from the loin to the shoulder-blade should be nearly of one breadth, and from thence it should taper a little to the front of the shoulder; the neck vein should be well filled forward, to complete the line from the neck to the brisket; the covering of the shoulder-blade should be as full out as the buttocks; the middle-ribs should be well filled, to complete the line from the shoulders to the buttocks along the projection of the outside of the ribs.

These are the chief points of the form of a fattened ox. The examination by the touch follows the appearance to the eye.

The position of the flesh on the carcase is a great consideration in judging of the ox, as the flesh on the different parts is of various qualities. The finest meat lies on the loins and the rump, and on the fore and middle ribs; consequently the ox that carries the largest quantity of beef on these "points" is the most valuable. Flesh of fine quality is of finer texture in the fibre than coarse flesh, and it contains more fat in the tissue between the fibres. It is this arrangement of the fat and the lean that gives the richness and delicacy to the flesh. The other parts, of various qualities, and used for soups and salting, do not fetch the high price of the parts described.

The point or top of the rump is the first part of a feeding ox that shows the fat, and in well-bred animals it becomes a very prominent point. Sometimes, by protruding too much when the quantity of fat is out of proportion to the lean, it misleads an inexperienced judge in the true fatness of the ox, as fat may be felt on that point, and be very deficient on the other parts which constitute a valuable frame.

A full twist, lining the division between the hams with a thick layer of fat, a thick flank, and a full neck vein, are generally indicative of prime fattening, and also of

the secretion of internal fat ; but it frequently happens that these signs wholly fail, and it is observed that a fine exterior does not warrant a similar inside of the ox ; and thin-made beasts, with flat ribs and large bellies, very often produce a large quantity of internal fat. The Alderney cattle furnish an example of this case. Their outward gaunt appearance seems deficient in every fattening point, and yet few animals afford so much inside fat in proportion to the quantity of carcase flesh.

The parts that are the last in being covered with flesh are the top of the shoulder and the point of the shoulder joint. When these points are felt to be well covered, the other and better parts may be considered to be in perfection, and a prime condition may be expected. But the general handling must establish the real condition, for there is a wide difference between the apparent and real fatness of an ox. The flesh may feel loose and flabby of an ox that has appeared very fat to the eye, and a truly fattened animal always feels " hand fat." Such handlers never deceive the butcher, while loose fattenings never kill well.

A judge looks at the fattened animal in the full broadside, in front, and from behind. If the examination is commenced in the middle of the body, the points of the fingers touch the whole side of the ribs from the shoulder to the hook-bone in various places, and satisfies the inquiry if the flesh be delicate and firm, and imposed in a regular manner. The right hand can be stretched to the hook-bone, examine the short ribs, and if the bone of junction be covered with flesh, to show the fitting roundness of the formation, and if the vacancy between it and the short rib is well arched over with firm flesh. The flank is at the same time examined by being grasped in the hand, and felt to be bulky and firm with flesh, and at the same time mellow and pliant. A good flank should be protuberant rather than depending, in order to contribute to the cylindrical shape of the carcase by filling up the hollow that happens at the junction of the body with the thigh. A step of the body of the judge backwards will enable the hand to reach the rump, or root of the rail, which is the extreme part of the body, and the first to show the condition of fat. That part must be well examined, both by touch of the fingers and grasp of the hand, and the flesh must feel delicate and soft, firm and compact. The quantity must be moderate, and not form bunches and protuberances. The same hand touches the thigh in several places down to the hock-bone, and settles the quality of the flesh of each part ; the length of the rump from the hock-bone to the extremity below the tail is much attended to, and also the depth of the thigh to the point of contraction. The posterior width of the animal over the thighs is minutely observed, and the interior width, or " twist," and also the lining of it with fat ; and if the purse be large, solid, and well furnished with a fatty secretion. A perpendicular thigh will be expected which will plumb a line ; a protuberant thigh is a great deformity.

The left hand of the judge resumes the examination on the middle ribs, and moves forwards, touching the fore ribs in several places, and not omitting the point and top of the shoulder, and ending with the neck vein. The right hand follows behind, repeats the touches, and verifies or contradicts the conclusions of the left, and may discover places to be touched that the left had passed over. The girth is to be carefully examined, if the joining of the ribs with the shoulder be not widely discernible, or filled up beyond discovery, as it should be. The depth is to be marked, that it descend to the level of the lower part of the belly, and measure in a straight line from the fore to the hind legs. For this purpose, the flank of the fore girth must fill the cavities of junction of the body with the fore and hind quarters. The neck and brisket are examined, and must be full and fleshy, and attach the shoulder backward in a swelling junction, and slope to the head in a gentle and very graduated taper.

If the judge approaches the animal on the posterior parts, the rump is first touched and grasped by the right hand, and the flank by the left. The right hand is then removed to the hook-bone and short ribs, while the left grasps the middle ribs, and progresses to the fore blade, the right following along the back of the animal till it meets the left on the top of the shoulder.

In passing round the head, the neck and brisket are examined, the width of the latter being carefully remarked, and the former seen to be full and fleshy. The other side of the beast is examined by the touch of the hands, and the termination is made at the twist and purse, where the inspection began on the left side.

The cylindrical body of an ox should approach the form of a square as near as possible, and the original structure is the chief conducement to this purpose being effected ; and the full fattening fills up the cavities that may be impossible to prevent. The back is perfectly straight from the top of the shoulder, or root of the horns, to the rump or set-on of the tail, whence a line hangs plumb to the under part of the thigh, and squaring the buttock. From this point a line is straight to the lower shoulder along the flank, the end of the ribs, and the fore-girth, requiring a protuberant flank, an arched swelling of the ribs and a fulness of fore-girth, and a flattened shoulder, without an outward extension or irregular projection of the bones.

A straight line levels the belly from the centre of the fore legs to the position of the purse in the middle twist of the hams. The upper and lower straightness of the square are not very difficultly attained ; the side-lines are the great objection, and constitute the chief deficiency of the animal frame. Not one breed of cattle that is yet seen in Britain possesses all the necessary qualities. A single property is marred by one or more deficiency, and very often a number of the latter combine to overthrow an individual pre-eminence. The short-horn breed immeasurably excels all others in the ample development of the hind quarter. The length of the rump, width and depth of the thigh, are unequalled ; and every part is excellent from the extreme posterior to the middle ribs. From this point forwards the same excellence does not prevail : the fore girth is often deficient, the shoulder is projecting sideways, and the top often bare of flesh ; the neck is thick and shaggy, with loose leather, and the whole fore-quarter of the animal

exhibits a heavy coarseness in bones and skin which the breed may have inherited from the female progenitor in the Galloway cow. The very best breeders have not been able to banish this property from their herds. The width of the hind-quarter very well extends the line of straightness along the side of the carcase; the flank is not deficient, and the curvature of the ribs is convenient; the quantity of offal makes no outward intrusion, but the fore-girth often shows a cavity; the shoulder projects too far, destroys the longitudinal squareness, and approaches the form of a trapezium. In the fore-quarters, both the Hereford and Devon breeds excel the short-horns: the fore-girth is more full, and the shoulder more flat, sloping very beautifully both to the ribs and neck, and is consequently better covered with flesh on every part, the very late parts included, on the fore point and extreme top. But then all animals of these breeds lose the width behind the hook-bones, and slope to the posterior buttock, narrowing the twist and lessening the quantity of the most valuable part of the carcase. The superiority of the short-horn breed on this point outbalances the objectionable fore-quarter; and the animal, of all beasts that are fattened, approaches nearest to the square form, and is very justly taken as a criterion, or rule of estimation and judgment.

The eye is able to form an opinion of the exterior conformation of an animal, and when aided by the touch, a judgment may be made of the quantity and quality of the flesh and fat which are provided on the parts fattened. But the inside furniture, or the fat that is secreted among the intestines, is placed beyond the reach either of the eye or the touch, and the estimation can only be formed by analogy. The nature of the individual constitution altogether rules the disposition to provide an internal furniture; for it has been often seen and sufficiently established, that animals of all breeds that exhibit great fattening points on the exterior do not prove so well as others that want these points, and that the most unseemly outsides very often afford the best inside furniture, both in quantity and quality. But it is a general assumption that a well fattened exterior will afford an inside of similar provisions, though no fixed rule can be laid down or established. A ratio somewhat inverse may be borne to each other by the outside and interior accomplishments of the fattened condition, as the fattening and milking propensities are found to diverge, as one or the other predominates. Nature seems to be unable or unwilling to support both properties in the superlative degree.

A fattened carcase having been ascertained to be in prime condition, curiosity is incited to know if possible the dead weight of the beast while it yet lives, and to calculate the probable value from the current prices of the saleable meat. Two mechanical methods have been adopted to attain this object—by weighing the animal, making allowance for the offal, and by measurement. Though mathematical exactness never can attend either of these methods, yet with due estimation of the influential circumstances, a means of assistance is afforded of arriving at the carcase weight, and consequently at the value of the animal, with sufficient accuracy for practical purposes. The most approved conclusion states the live and dead weight to be as 9 to 5, or multiply the live weight by the decimal .605, and the result is the weight of the four quarters. The allowance for offal is very largely and variedly influenced by the breed of the animal, sex, age, and accidental circumstances. The above rule forms an average, and the annexed table exhibits the medium of offals in fat cattle:

	In general.	In rare cases.
Hide and horns	4 to 7st. (14lbs.)	8 to 9 st.
Tallow	3 to 10st.	nearly to 20 st.
Head and tongue	2 to 3½st.	
Kidneys	2 to 4lbs.	
Back collop	2 to 4lbs.	
Heart	6 to 9lbs.	
Liver, lungs, and windpipe	1½ to 2st.	
Stomach and entrails	10 to 14st.	
Blood	3 to 4st.	

The animals of Britain may be classed in three divisions — Shorthorn, Hereford, Sussex, and Devon; Longhorns, Galloways, Northern Scotch, Suffolk, and Welsh; West Highland cattle, Shetland and Orkney islands. The per-centage of beef to live weight may be thus given.

	Per cent. of beef to live weight.		
	Class 1.	Class 2.	Class 3.
Half fat	55 to 59	50 to 55	48 to 50
Moderately fat	60 to 62	56 to 60	51 to 55
Prime to very fat	63 to 66	61 to 63	56 to 60
Extraordinarily fat	67 to 70	64 to 66	61 to 66

These figures apply to the ordinary fattened animals, in heifers and oxen.

The most approved formula of ascertaining the weight by measurement, multiplies the square of the girth by the length, and that product by the decimals .24 or .25, for the weight of the four quarters in imperial stones. Assuming the carcase to be a true cylinder, the area is found by multiplying the length by a sectional part of the figure, and here is the square of the girth multiplied by .07958 (the area of a circle whose circumference is unity) for the area of section, which, multiplied by the length, gives the solid contents of the cylinder. The difficulty remains in giving a certain weight to any given quantity of the cylinder. It has been assumed, probably from experiment, that every cubic foot of the cylinder will weigh about 3 imperial stones. Now .07958 multiplied by 3, gives .238, or .24 as being more convenient for practice. Experiment has had a very large share in fixing such rules for practice.

The following table of multipliers has been carefully compiled:—

Condition.	First class.	Second class.	Third class.
Fair beef	.23	.22	.22
Moderately fat	.24	.23	.23
Prime fat	.25	.24	.24
Very fat	.26	.25	.24
Extraordinarily fat	.27	.26	.25

The decimals .26 and .25 may apply to the beasts of the forthcoming Christmas exhibition in London.

The live weighing of the animals exceeds the measuring process, in ascertaining the weight gained in any certain time. The tape line can be used at any time when the weighing machine is beyond reach, and for

computing the quantity of beef, is preferable to the weighing alive, though it is unable to determine the fattening that is gained within certain periods of time.

Arbitrary assumption must not be allowed to have produced the rules that have been now given for judging live stock; they constitute the natural means that exist to enable some satisfactory conclusions on the subjects that have been treated. Much observation and practice are required in order to understand and apply the means of judging the different circumstances of the animal existence. All persons cannot perceive the tendency of these rules to lead to a correct judgment; long and careful observation being requisite to convince the mind of their value in that respect. Tuition cannot do it, without practical experience; the study of nature has furnished these rules for guidance, and as the laws of nature are general, these rules must be of universal application. The acquirement is generally sought of judging accurately of the quality and weight of live stock; every farmer is desirous to possess it, and every pupil in agriculture mostly appreciates it in the most enticing form. No breeder of animals can possess a higher accomplishment, and the highest perfection of breeding is maintained by it. An extensive experience is essential to its acquirement; and even with that enjoyment, some persons never become good judges. An acute observation must cull from the lessons of experience, and with much judgment and discrimination. These natural faculties are not gifted away with profusion, nor are the requisite trouble and perseverance bestowed to supply the wants. Most persons must be judges intuitively or not at all; hence the many expedients that have been adopted to acquire the knowledge and experience, the many tables from measurement, and rules from live weight. Good judges very rightly contemn these rules and tables, as they can ascertain the real weight of marketable flesh on any animal much more nearly by the eye than by any superficial rule, and the true quality of it by the touch—a property which these tables can in no way convey. No surprise need be raised by the comparative superiority of the senses for this purpose, the depreciating and enhancing points of the carcase cannot be determined by artificial rules, and the tape and the steel-yard cannot be substituted for the eye and the hand. If the bodies were true cylinders, and if the offals always bore a definite and invariable ratio to the four quarters of flesh, then the measurement might tell accurately; but the various proportions that exist require the judgment to compare the value of the several disproportionate parts. It is nevertheless true, that the primest condition of animals, which approach the nearest to the mathematical, are approximated by rules, which are still inferior to a practically matured judgment. The rules, however excellent, require a correct application; the girth and length are to be nicely taken, as one inch will blunder more than the eye of the judge. The live weight depends on the fulness or emptiness of the carcase with food; and neither weighing nor measurement give any idea of the quality of the flesh, which rests on the eye and the hand to judge in this most essential particular.

THE BIRMINGHAM SOCIETY AND THE PREMIUMS FOR HORSES.

Sir,—No one can rejoice more warmly than I do at the spirited determination of the Council of the Birmingham Society to hold a triennial show for the exhibition of store stock. Meetings like these cannot be too much encouraged, evincing, as they do, the growth of a metropolitan spirit in our provincial centres of activity. It is this which distinguishes English country life from every other in the world, and imparts to it a dignity unknown elsewhere—namely, that we think, feel, and act for ourselves, instead of allowing the metropolis or the Government to impose their opinions, their sentiments, and their will upon us. As regards agriculture especially, these gatherings embracing a district at once sufficiently wide, and readily accessible, tend much to spread information and excite public spirit among a body of men, who, like the agriculturists, are not in general very readily drawn from home. Having thus expressed my friendly feeling towards the undertaking in question, I need scarcely assure the Council of the Society, that in commenting, as I am about to do, on a portion of the prize list for the first exhibition, I am actuated solely by a desire to serve the best interests of the society, and of the agriculture of the midland counties.

In my last letter I censured the Yorkshire Agricultural Society, because it awarded no higher prizes for "stallions for hunters" than those which it offers for "stallions for agricultural purposes." I little imagined when I wrote that I should ever see a prize list in which the thoroughbred horse was actually rated at a *lower* value than a cart horse! Such, Sir, was the startling information which you last week afforded us. The three prizes for "stallions for agricultural purposes" are £25, £15, and £10. The two for "roadster stallions" are £15 and £10, while those for "hunting stallions," which I presume means thoroughbred ones, are £15 and £10. An agricultural society, which ought to be the guide and teacher of the farming community, deliberately places the highest breed of horses below the lowest. As well might the noble be ranked below the pariah, the shorthorn be classed beneath the polled runt, or the Leicester and the South-down be put below the level of the mountain Scotch or Welsh sheep! Perhaps the Council may consider thoroughbred horses to be mere luxuries, unconnected with, and not adapted to, the improvements of commercial and agriculturally useful horses. If such is their idea, a more erroneous one can scarcely be conceived, as I trust to demonstrate in my next letter. In passing, I will only remark that Short-horns and Leicesters and Southdowns were regarded as luxuries once, the mere hobbies and amusements of the few: now they have grown into important elements of agricultural

wealth. So in the thoroughbred stallion, and, I will add, in the roadster too, there is a mine of wealth to the farmer, which it only requires knowledge to work. The Yorkshire farmers have discovered the way. Why should the secret be theirs alone?

In considering the subject of premiums, it seems evident that there ought to be some general correspondence between their amount and the average value of the animal for which they are given. It would be ridiculous to give £50 for the best pen of Cochin-China or Polish chickens; while, on the other hand, to offer a sovereign to the owner of some "Fourth Duke of York," or "Grand Duke," would be resented as an insult. To a certain extent, agricultural societies act upon this principle. Thus, the Royal Agricultural Society's scale begins with £40 for the best bull, and descends to £15 for the best boar. And, with one exception, I find no fault with its premiums, which without being extravagant are liberal. The exception to which I allude is the paltry sum of £15, which is deemed a sufficient prize for the best roadster stallion. If the Society's funds will not permit it to make the premium equal to that for the best agricultural stallion, it had better, as it does with thoroughbred horses, give no prize at all. In like manner, the Yorkshire Society rates the best stallion, of whatever breed, at less than the best ram, while it rewards the best boar or the best sow more bounteously than it does the second best stallion. Now, without meaning to contend that the rule-of-three ought in every case to be strictly applied as the ratio of the premiums, there certainly ought to be some limits beyond which they ought not to vary from it. If they were to oscillate between 10 per cent. as the lowest rate and 50 per cent. as the highest, this would, with a due attention to other considerations, afford ample latitude, while it would be some guarantee against the glaring injustice of the present system. With the view of showing how the plan which I propose would work in practice, I have drawn up the following table, in which the first column shows the estimated average value of the principal kinds of stock for which prizes are given; the second gives the prize for each which I consider fair; the third shows the proportion per cent. of the prize to the value of the stock for which it is offered; while the fifth and sixth are the premiums actually offered by the Royal Agricultural and Birmingham Societies. I have purposely put the value of other stock relatively higher than that of horses. Very few bulls sell for £300, nor is £200 a common price for a cow.

	Aver. Value.	Proposed Prize.	Rate per cent.	R. A. S. Prizes.	Birm. Prizes.
	£	£	£	£	£
Bull	300	30	10	40	25
Cow	200	20	10	20	15
Ram	40	15	37½	30	15
Boar	30	10	33	15	15
Thro'bd. Stallion	300	30	10	0	15
Road Stallion..	200	25	12½	15	15
Agri. Stallion..	100	20	20	25	25

With reference to my estimate of the value of thoroughbred and roadster stallions, I will make no comment, but simply state that at the sale of Mr. Wm. Burton's stock last month, his stallion "Post Tempore" was bought in at 1,100 guineas; "Pilgrim" for 600 guineas; "Bullet," a roadster stallion, which gained the first prize at Sheffield, and was then the most perfect colt of his class I ever saw, was bought in at 400 guineas!

Of course, it is open to any one to object to my scale of prizes; nor do I lay much stress upon the particular amount of each. But, at any rate, it is an approximation to a fairer plan than that usually acted upon by agricultural societies, of which the only rule that I can discover appears to be the defiance of all principle. If I am asked why I give a higher per-centage on the value to sheep and pigs than to other stock, I reply, because being animals of general utility to the community, and especially to the poor, I consider that those who improve the breed of either deserve greater proportionate encouragement than those who devote their energies to more ambitious objects. On the other hand, there is a limit beyond which it is absurd to go; and it appears to me that £15 for a ram, and £10 for a boar, are amply high enough to induce their owners to bring the best of each for exhibition, and to reward their efforts if successful. It would seem, from the above table, that the Council of the Birmingham Society rates thorough-bred and roadster stallions on the same level with rams and boars. Of the slight thus offered (doubtless unintentionally) to the owners of horses I will say nothing; but only remark that there are many other reasons besides the value of the animals why the premiums awarded to them should be handsome. In the first place, the trouble, risk, and expense of rearing every other male animal are trifling indeed compared to that of a stallion. Nearly every farmer keeps his own boar; the flock must be small indeed which has not one or more rams; while with regard to bull's, if the farmer has not one of his own, ten to one but his neighbour has, and will permit access to it on easy terms. With all these animals, too, if the breeder fail in his object of obtaining a high price for them, he can, at any rate, realize their value to the butcher. But how is a thorough-bred stallion to be obtained? To breed one would be an expensive undertaking, and, indeed, a hopeless one to a person not versed in such matters. In the first place, there would be the purchase of the brood mare, which, if of any repute, would probably cost some hundreds; then the difficulty of choosing a stallion—the price of his services from £10 to £20 additional. After all this expense had been incurred, in addition to the keep of the foal, it would probably be found that—owing to some mistake in the choice of either or both parents—the outlay of years had been thrown away, and that a brute worthless for any purpose was the only result. In fact, the ordinary run of farmers have no means of improving their breed of horses but by availing themselves of the services of such stallions as happen to be in their immediate neighbourhood. If there should be one which has earned a high reputation on the turf, and at the same time possessing the symmetry and the soundness which render him a desirable sire for hunting or carriage colts, then he may consider himself fortunate indeed if such a horse is allowed to cover at a moderate price. For sires like these are by no means easy to find; and when found their price is, as I have already shown, exceedingly high. I have been a breeder of horses myself for many years, and all my life I have been met with this difficulty of finding stallions to suit my purpose. Either they were inferior

animals, or else they were only allowed to cover half-bred mares at a thorough-bred price; in short, I found that it was necessary to purchase a first-rate stallion, in order to enable me to carry out my views in breeding. Generally speaking, a horse of this description is only located in the neighbourhood of some large breeding establishment, where the number of thorough-bred mares is such as to render it a profitable speculation. But precisely those districts where they are least likely to be met with, are those in which they are most needed for the purpose of improving the breed of ordinary horses; and therefore it is that agricultural societies ought to hold out every encouragement to establish them in such localities; for the motives for bringing them there are few, and the difficulties numerous. It is not every servant who can manage a stallion; few men know how to select him; many persons would object to have a horse of this description about their premises. Regarded as a mere commercial speculation, it is attended with much uncertainty, since it is scarcely possible—even for the most experienced in such matters—to say how far any given horse will hit the public taste. As to their exhibition, as "Cecil" has shown, the owner of a good animal may throw away some portion of its reputation, at least, if it fails to obtain a prize. The risk of injury too, both on the railroad and in the show-yard, is greater than with any other stock.

For all these reasons, then, ought agricultural societies to hold out encouragement with no niggard hand to the owners of first-class stallions who render them accessible to the great body of agriculturists. If English horses are to maintain their reputation, it is only by breeding from the best, and from none others. Foreigners have been importing good ones for years, and are thus rearing no despicable animals of their own. Why do our fairs abound with the rubbish that they do, but because inferior sires and dams have been bred from, either through ignorance or mistaken economy? I never look at such brutes with patience; because the reflection always occurs to me, that with a glimmering of science on the part of the owners, they would not have been in existence. There are many breeds of horses, all serviceable of their kind; but, in order to obtain good individuals of each, the sire is the most important element of success. With the one single exception of the dray-horse, there is no breed or variety in which a greater or less infusion of thorough-bred blood does not produce a palpable improvement. For I lay it down as a universal rule, that, in proportion as thorough-bred horses are appreciated by and accessible to the great body of agriculturists, so are horses of every other breed and class excellent and valuable.

To illustrate this proposition, with regard to working-horses will be the object of my next letter.

I remain, your obedient servant,

WILLOUGHBY WOOD.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The first monthly Council after the autumn recess was held at the Society's house, in Hanover Square, on Wednesday, the 2nd of November. The following Members of Council and Governors were present:—Colonel Challoner, Trustee, in the Chair; Sir John Villiers Shelley, Bart., M.P., Sir Matthew White Ridley, Bart., Mr. Raymond Barker, Mr. Barnett, Mr. Barthropp, Mr. Blanshard, Mr. Brandreth, Mr. Burke, Mr. Garrett, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hornsby, Mr. Kinder, Mr. Milward, Mr. Simpson, Professor Simonds, and Professor Way. The names of 25 candidates for election at the next meeting were received and read.

FINANCES AND HOUSE.—Mr. Raymond Barker, as Chairman of the Finance and House Committees, laid before the Council the reports of those departments, which were received and adopted. He also laid on the table, for the information of the members, the quarterly statements of actual receipts and payments, estimated income and probable expenditure, invested capital and liabilities; explaining in detail the bearing of those respective branches of account upon each other. He reported the current cash balance in the hands of the Society's bankers to be £795.

GLOUCESTER MEETING. — Mr. Milward, as senior Steward of the Cattle Yard at the Gloucester Meeting, reported the unanimous decisions made by himself and his colleagues in that department, on the various points referred to them by the Council. He also stated that their report on the show of cattle at the Gloucester Meeting was in preparation for the Journal; and their suggestions in reference to the exhibition of live stock generally at the Lincoln Meeting ready for being laid before the Special Council in December, when the prizes and their conditions of competition would be arranged for next year.

LINCOLN MEETING.—The report of the General Lincoln Committee was received, and its recommendation adopted, that the Lincoln meeting should be held next year in the week commencing Monday, the 17th of July.

JOURNAL.—The President transmitted information to the Council that the new Journal was in an advanced state, and that there appeared no reason to doubt its punctual appearance at Christmas next.

MEMBER OF COUNCIL.—On the motion of Mr. Brandreth, seconded by Mr. Raymond Barker, Lord Bridport was elected a member of the Council, in the place of the late Mr. Bennett, of Bickerings Park.

MISCELLANEOUS COMMUNICATIONS. — From Viscount Palmerston—foreign communications on the destruction of insects, and the cure of the Potato disease. From the Smithsonian Institution of Washington—a collection of valuable and interesting works published under their authority. From M. Van Alstein—a statement of his mode of growing Potatoes alternately with Hemp, and its beneficial effects on the Potato. A great number of letters from France and Belgium—on the nature and treatment of lameness in sheep. A communication from Professor Solly to the President, on co-operation in the collection of samples of English wools, for the intended National Trade Museum [the aid which he is desirous of obtaining from the Society "being confined to the preparations of the necessary circulars and lists of breeders, the classification of breeds, crosses, and varieties, and such general advice and co-operation as it may be in the power of the Council to render"]. From Mr. Henry Wood, of Holden House, Southborough—two Lupin plants, grown by him from seeds received from Egypt (with a supply of seed and a statement of cultivation, referred to a weekly meeting of the Council). From Mr. Fisher Hobbs—a supply of French steep for Wheat, placed at the Society's rooms, at the disposal of such members as wish to obtain a portion for trial and report.

The Council having ordered their thanks for the various communications submitted to them, adjourned to their monthly meeting on the 7th of December.

AGRICULTURAL BIOGRAPHY.

(Continued from page 221.)

CCCXXXVIII.—Price, 1809.

Daniel Price of Appledore, Kent, wrote and dedicated to Sir John Sinclair, Bart., M.P., "A system of sheep grazing and management, as practised in Romney Marsh, illustrated with plates;" London, 1809, price 2 guineas in boards. A very plain map of the marshes faces the title-page, and the quarto volume contains twelve chapters, and 480 pages of letter-press. The author enters largely into the natural history of the sheep; varieties, and different habits; the breeding and selection, the anatomy and practical management. The profits of fattening lands, stocking of fields, and the size of enclosures, fill an entire chapter; with rules for young graziers, and on artificial food. The monthly management of sheep in the marshes is described over the entire year, and the four last chapters contain miscellaneous matters of a very useful nature. The author advocates a grazing college, in which to test and confirm all suggestions relating to animals, grasses as food, wool, and diseases; cows for milk and for beef, rearing of calves, swine, &c. The circular plan is given of an experimental farm, divided into many fields of 1 to 8 acres for the special purposes. A square plan is given that is similarly divided. The two last chapters treat the diseases of sheep.

This work is not clearly arranged, nor scientifically detailed; but it contains a large mass of useful matter heaped together, without rule or appropriate position. The practice is not forward, nor leads any advance.

CCCXXXIX.—Edgworth, 1810.

Richard Lovell Edgworth, Esq., F.R.S., and M.R.I.A., civil engineer, residing at Edgworth Town, Ireland, wrote "An essay on the construction of roads and carriages;" London, 1810, 8vo., price 14s. The work occupies 171 octavo pages, with portraits of carriages and the applications of draught. The directions for making roads are very sensible and enlightened, and put forth the practised modes of the present day. The author was father of the well-known Maria Edgworth, whose tales have enjoyed a much superior celebrity to the wheels and carriages of the father. The purposes, though distinct, have vied in utility.

CCCXL.—Kerr, 1810.

Robert Kerr, surgeon, F.R., and A.S.S., Edinburgh; an excellent naturalist and general scholar, died in 1814. He wrote "Statistical, agricultural, and political survey of Berwickshire;" 1809, 8vo., price 13s. This work is not found in the National Library, though it contains the professional and general works of the author; the authority comes from the Bibliotheca Britannica and Loudon's list of authors. Private opinion has reckoned this work to be a valuable production, and very explanatory of one of the first farming counties in Scotland. The author was a person of general eminence.

CCCXLI.—Williamson, 1810.

Captain Thomas Williamson, upwards of twenty years in Bengal, wrote "Agricultural mechanism; or a display of the several properties and powers of the vehicles, implements, and machinery connected with husbandry;" London, 1810, 8vo., price 10s. 6d. The National Library does not contain this work, though there are found the other works of the author on oriental subjects. It is a matter of regret that publishers are not more punctual in sending a copy of every book to be preserved for future examination; the author's ideas may have been worth looking at, and probably of being recorded, though they may not have held out any new benefit.

CCCXLII.—Adams, 1810.

George Adams wrote "A new system of agriculture and feeding stock;" London, 1810, 8vo., price 10s. 6d. Intended chiefly to recommend patent portable beast houses and sheep cots. This treatise comprehends twenty-nine octavo pages, directing the performance of his new system of agriculture, which implies the consuming of all green crops on the ground by cattle and sheep. The beasts are tied to a manger under a roofed moveable shed, which is removed as wanted by running on a cast-iron railway, which is lifted at pleasure. The author had been a practical farmer for twenty-six years, and the treatise is the result of his practical knowledge.

Our professional propensity inclines to such practical observations more than to useless dissertations on carbon and hydrogen, salts and acids. And something similar to the above system had occurred to our reflection before the treatise now mentioned had been seen. It seems very possible to consume all green crops on the ground by cattle

and sheep, the latter in loose confinement under moveable sheds of timber, and the beasts tied to a manger which is part of a moveable timber shed. Cast-iron rails placed in trenches are run upon by the wheels of the sheds, which are in a longitudinal direction, as the growing food is consumed. The roof of the shed covers a feeder's walk, by which the food is introduced and placed in the manger. The litter is cut straws from the farm yard, which is used in quantity to keep the animals comfortable. The land will be enriched by urine, solid excrements, and straws, all puddled into a very intimate commixture, which will be much assisted by the covering of the ground by the roof of the shed, protecting it from wasteful influences, and by being breathed upon and warmed by the respirations of the animals. This idea extends beyond the author's assumption: but the treatise shows the road, and paves the way to some valuable alteration in the use of root crops. No notice is remembered of the present book, the author, or his theory, or rather theoretical practice; our research found it in an octavo volume composed of similar short treatises, which had never walked into notice, but crept into a shelf in an associated form. Such works are often more valuable than huge quartos and unwieldy octavos.

CCCXLIII.—Hunt, 1810.

Charles Henry Hunt, Esq., wrote "A practical treatise on the Merino and Anglo-merino breeds of sheep; in which the advantages to the farmer and grazier, peculiar to their breeds, are clearly demonstrated;" London, 1809, 8vo., price 6s. 6d. The work fills 198 pages in five chapters, consisting chiefly in letters from persons who had so far succeeded in the use of Merino sheep. A lengthened description is given of Merino animals, and many arguments are adduced to show the advantages of the breed being introduced into Britain. But all the arguments and illustrations that were offered fell before the great stroke of practical experience, and the question seems now to be settled for ever.

CCCXLIV.—Drury, 1810.

Charles Drury, Mansfield, late farmer, wrote "Recent and important national discoveries, exhibiting a system of preparing corn, straw, turnips, &c., &c., for the better, cheaper, and more expeditious feeding of horses, beasts, sheep, and pigs; improving land, causing a great saving of corn, hay, and potatoes; fattening stock much sooner, and considerably increasing their weight;" London, 1810, 8vo. This splendid title-page adorns 38 octavo pages, which prepare food for animals by boiling, steaming, and chaffing of hays and straws; and recommend turnips to be boiled, pulped, and mixed with meals of oats and beans, and with cut straws. It may be suspected that after any preparation of straws, the original quality of straw will remain, and turnips and potatoes in a raw state are equally if not more agreeable to animals than the boiled or steamed condition. The work of the author was republished in 1815 in an octavo volume of 200 pages, with the addition of the manuring of all fallows, so as to grow great crops of wheat, &c., at little or no expense, feeding the straw beast fat in winter, and keeping double the number. No doubt that swine are much benefited by cooked food; but to feed oxen on boiled straw and meals, may be more doubtful. The author enlarges on the use of boiling, and asserts that three heads of cattle for one may be kept by using that preparation, and urges that cut straws, grass, and clovers be all boiled together. Calves are reared without milk, with the liquor of hay and turnips boiled together, mixed with oatmeal and salt. This drink will but little equal the milk of the dam in point of nutriment. Dogs and poultry are fed on boiled meats. The manuring of land is done by eating the crops with sheep, and by folding the animals on the fallow grounds. Tabular forms are given of the rotations of cropping. Urine as a manure is much commended. The four concluding pages are devoted to the ploughing of land with beasts, which the author thinks are preferable to horses, at least in some purposes. But general purposes compose the requirements of the farmer, and the horse is most generally useful.

This author had been a person of fruitful ideas, but puny and meagre, and had not a large grasp of original conception. The range was deficient, which can wander beyond the visible horizon, and frame a world for itself. Such minds are few, but they do exist.

CCCXLV.—Greg, 1810.

Thomas Greg, Esq., wrote "A statement of the system in which a farm is managed in Hertfordshire, without fallow, being heavy land, and inclined to wetness, and slightly calcareous." On these soils, the author discarded the naked fallow of the land, and produced turnips; wherever the latter crop *can be grown*, the difficulty vanishes, and the occurrence is an every day performance. The farm in question was again returned to a dead fallow, as the pulverization of the soil that was done and could be effected by the turnip crop was not equal to the fallowing during summer, and did not keep the land in the same good condition. This fault arose from the soil being clayey and tenacious beyond the power of the turnip preparation to effect the proper state.

CCCXLVI.—The Practical Norfolk Farmer, 1810.

This name wrote "The practical Norfolk farmer

—describing the management of a farm throughout the year, with observations founded on experience;" London, 1810, 8vo. The work contains 147 octavo pages, divided into the twelve months of the year. The dedication is to Thomas William Coke, Esq., and the book is wholly a Norfolk thing, with an excellent article on leases, which was the means of improving that county. Each month of the year is arranged to contain the due portion of the system of farming, beginning in September with the sowing of turnips, winter vetches, wheat, and rye for spring feed and for seed. The work is well described, and shows a thorough practical knowledge of Norfolk farming.

CCCXLVII.—Maddock, 1810.

James Maddock, florist, wrote "The Florist's Directory; with a supplementary dissertation on soils and manures;" London, 8vo., 1810. The essay occupies 30 pages, and treats clay, sand, gravel, calcareous and absorbent earths, vegetable substances, metallic substances, and salts. The statements are short and sensible.

CCCXLVIII.—Williamson, 1810

C. Williamson wrote "General Dictionary of Agriculture, gardening, and planting;" 2 vols, 8vo., price 10s. This statement appears in an advertisement; but no catalogue of books or list of authors mentions the name. The author may have been Captain Williamson, who has been mentioned; but this is only a surmise.

CCCXLIX.—Morley, 1811

John Morley, of Blackline, in the county of Norfolk, farming bailiff to the Hon. W. Assheton, Harford, wrote "Cheap and profitable manure, or plain and easy directions for preparing, and method of using, an excellent compost for manuring arable, meadow, and pasture lands in general. To which is added his much approved plan of damping muck, whereby a considerable expense is saved to the farmer; and also the manner of improving the growth of underwoods in the most luxuriant way;" London, 1811, 8vo., price 7s. The work fills 72 octavo pages, and the title-page of the second edition nearly equals the whole book, which treats in a very short way—preparing and manuring lands for wheat; preparing dung for turnips; dressing pasture lands and new layers; damping dung; lime; grazing lands; arable grounds; manures for each; turnips; underwoods; hints to graziers. The underwoods are improved by bending into the ground the pliable stems, and fastening by a peg the notched branch. Shoots rise from the point of insertion, and one best stem being left, a tree of some kind is produced. The ideas of this author are very simply practical, and not far-sighted.

CCCL.—Worgan, 1811.

G. B. Worgan wrote "General view of the agriculture of the county of Cornwall, drawn up and published by order of the Board of Agriculture and internal Improvement;" London, 1811, 8vo., price 12s. The report occupies 182 octavo pages, with a map of the soils of Cornwall, some drained grounds, fences, implements, cottages, farm offices, and front elevations. The portraits of swine and a Devon bull are complete caricatures. The author dates the preface from Bodmin.

The contents of the book are of the usual nature, and seem sufficiently executed for the purpose. The appendix is of three articles—on spring wheat, copse woods, and an old address to the inhabitants.

CCCLI.—Davies, 1811.

Walter Davies, A.M., rector of Manafon in Montgomeryshire, wrote "General view of the agriculture of North Wales, containing the counties of Anglesey, Carnarvon, Denbigh, Flint, Merioneth, and Montgomery; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1811, 8vo., price 12s. The work occupies 510 octavo pages, with a neatly coloured map of North Wales, designs of cottages and cottage gardens, and of lead ore mines. The description is very ample of the mountains and mines of the primitive Cambria, with the varied soils and surfaces of the vales, hills, and mountains.

The cattle and sheep of the different counties are very well described, and the peculiar adaptation most truly stated. The horses and ponies are well exhibited in the native garb of quickness and utility, and the swine are shown to be defective. Poultry, bees, and rabbits are not much found in Wales, at least, in excellence. The labour, servants, and poor are very properly described, with the obstacles to, and means of, general improvement. The appendix is long, containing letters upon various subjects, from persons connected with Welsh affairs.

The report exhibits much sound information, and an acute judgment on every point of discussion. It has always been esteemed, and recommended as a source whence information may be got.

CCCLII.—Gooch, 1811.

Rev. W. Gooch, A.B., wrote "General view of the agriculture of the county of Cambridge; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1811, 8vo., price 9s. The report occupies 301 octavo pages, with a map of the county, coloured in the various soils of ground. The work is very neatly performed and in a superior manner. The author shows a

very liberal spirit on agricultural policy, and much sound knowledge on practical subjects. Maps are given of the new cuts for the waters of the fens, showing the new courses of the rivers with the old beds. The descriptions are very interesting of the improvements made in the alluvial districts. A chapter of miscellaneous observations concludes the report, which is one of the best of the kind.

CCCLIII.—Smith, 1811.

William Smith, engineer and mineralogist, wrote "The improvement of boggy land by irrigation, as carried into effect by him;" London, 8vo. "Observations on the utility, form, and management of water meadows, and the draining and irrigating peat bogs; with an account of Prisley bog, and other extraordinary improvements conducted for the Duke of Bedford;" London, 1811, 8vo., price 8s.

The above works are not found in the National Library, which contains only one or two of the author's geological productions. The Bibliotheca Britannica quotes the two works mentioned above, and no more; Loudon mentions Geological County Maps, Geological Map of England and Wales, and Geneal-logical Table of British Organized Fossils. There seems a misunderstanding among the authorities in respect of the works of this author, who was a person of very extraordinary exertion and merit, and was the first to propose and execute the geological maps of kingdoms and counties.

CCCLIV.—Farey, 1811.

John Farey, sen., mineral surveyor, wrote "General view of the agriculture and minerals of Derbyshire, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 3 vols., 8vo. The first volume contains the account of geological formations only; the second is devoted to the state and conditions of property and general improvements; and the third relates the operations of husbandry, with the plants, animals, and implements that are used. The illustrations are a plain and geological map of the county, and of faults and dislocations, implements and buildings. The maps are on a small scale, and very indistinct. The survey is full thrice the bulk of any other county report, and contains a very valuable mass of information on the geology of Derbyshire, which is one of the most interesting counties in Britain to the geognost. The author's labours were directed to the mineral stratification, and he enters little into the general geognosy of the district, and in respect of the relative position with other divisions of the kingdom. Lime is there best exhibited in the primitive formations, and gypsum exists in the various modifications of the deposit. South Derbyshire is rich in marly sandstones, and the north part of the county is primitive in a large sense of the term. The interventions between these extremes are most curious and interesting.

CCCLV.—Keith, 1811.

George Skene Keith, D.D., minister of Keithall and Kinkell, wrote "General view of the agriculture of Aberdeenshire; drawn up under the direction of the Board of Agriculture, illustrated with plates;" Aberdeen, 1811, 8vo. This report fills an octavo volume of 672 pages, with a map of the county, coloured in the various soils of clay, good loam, gravelly loam, inferior, various, heath, and barren. Portraits are given of several houses of noblemen, of the old abbey of Deer, and of farm buildings. The author of this report was a learned person, and very much superior to the parish clergymen of the north of Scotland, who are educated in a routine prescribed by the rules of becoming a pastor of the church, and have little knowledge beyond the gin-horse tract of that formula. In this view of the county, the state of the district is well described, and the varied relations observed. The divisions of the county are separately described, and ancient memorials very inquisitively divulged. The customs of the country have a large description, the advantages shown, and the wants pointed. Leases universally prevail of nineteen years, and implements are made in Aberdeenshire that are not exceeded in Scotland. The author shows much botanical knowledge and of mineralogy, which are probably too much introduced in a practical work: yet science is never to be condemned. The appendix contains an excellent dissertation on the British grasses, and a most amusing account of the author's expedition to ascertain by barometrical measurement the height of the well known mountain called Lochna-Gar, which was found to be 3,800 feet. A view of the mountain is given in an engraving of good execution.

The author may have loaded the report with cumbersome adjuncts, which seem to be wanderings from the main purpose; but variety is pleasing, and the work as a whole must be pronounced to be a valuable article of the kind, and superior to most surveys from Scotland.

CCCLVI.—Henderson, 1811.

Robert Henderson, farmer, Broomhill, near Annan, wrote "A treatise on the breeding of swine, and curing of bacon; with hints on agricultural subjects:" Leith, 8vo., 1811. The book is an octavo of 139 pages, containing the natural history of the hog; different species; management of swine; curing bacon; making of brawn; prejudices

against swine; great advantages of rearing and feeding hogs. The second part recommends the growth of hemp, and to use oxen occasionally for farm work. The conclusion is made of receipts and cures for the diseases of horses, cattle, and sheep.

The author had been a practical man of a superiority to the common degree, and imparts his knowledge in a plain and sensible manner.

CCCLVII.—Macdonald, 1811.

James Macdonald, M.A., wrote "General view of the agriculture of the Hebrides or Western Isles of Scotland, with observations on the means of their improvement; together with an accurate account of the principal islands, comprehending their resources, fisheries, manufactures, manners, and agriculture, drawn up under the direction of the Board of Agriculture, with several maps;" Edinburgh, 8vo., 1811, price 12s.

This report forms an octavo volume of 824 pages, with maps of the islands in the chief selected clusters. The book has no preface or dedication, and seems intent on the one purpose of legitimate description. The geographical state and circumstances of the islands are very minutely described in the situation and extent, the climate, soil, and minerals. The estates of land are detailed in the extent and management, tenures, houses, fences, roads and bridges. Farmers' rent, labour, poors' rates, land tillage, implements, crops, and animals, have an ample description, and followed by general improvements, as draining, plantations, shelter, and better housing. The author does not append nor intermix any scientific knowledge into the survey of these naked islands; it would certainly be inappropriate, and the contents are very judiciously restricted to practical language. No better report has ever appeared on any special subject, and stamps the author as a superior person.

CCCLVIII.—Macfarlane, 1811.

Duncan Macfarlane, D.D., and Rev. Andrew White wrote "General view of the agriculture of the county of Dumbarton, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" Glasgow, 1811, 8vo. This report occupies 344 octavo pages, with a very mean map of the county, and two plans of farm buildings. One is a fanciful erection by the Duke of Argyle, too costly for imitation, of which a fine print is given in the report. The other is on a plan of rural simplicity, that is much too confined for use. The general matter of the report is very well arranged, and the language is handsome, and very concise. It is an excellent report, and abounds in liberal sentiments, and most judicious remarks. The county is small, remote, and unbenignly situated, and the reporters have very wisely accommodated the matter to the circumstances. The existing objects are very well described, and many excellent suggestions are offered. The first inducement to improvement is the encouragement given by the landowner to persons of skill and capital to live upon the property, by furnishing the farm with every requisite on which the farmer's capital can be used with effect. This primary provision adapts in any country, and occurs to every first view of the subject; and then a length of tenure, to secure against detriment the outlay of the tenant.

CCCLIX.—Beasley, 1812.

W. Beasly wrote "A general view of the system of enclosing waste lands;" 1812. The National Library does not contain this work, or the name of the author; and Loudon's list of authors does not mention it. The above statement is taken from the Bibliotheca Britannica, which is the sole authority for the use of the name.

CCCLX.—Sellon, 1812.

John Sellon, land surveyor, wrote "Outlines of a philosophical theory—being an attempt to prove that gravitation and caloric are the sole causes of every phenomena in nature; with a practical application to vegetation and agriculture;" London, 1812, 8vo., price 8s.

The regret is very considerable that this work is not found in the National Library, as it announces the treatment of two most important points in physical knowledge. The action of caloric must be very large, as it is the agent of every operation done by the hand of man in promoting the growth of vegetation. Manures act by its medium, irrigation works by its stimulus, and ploughing of land exposes the ground to its influence. Loudon's list of authors omits this name, and the sole authority of its use rests with the Bibliotheca Britannica, from which the above statement is taken. The examination of such a work would have been most interesting, as the author gives a practical title to his name, and thereby is better qualified to adapt the laws of physics to the practical applications.

CCCLXI.—Strickland, 1812.

H. E Strickland, Esq., of Brighton, Yorkshire, wrote "A general view of the agriculture of the East Riding of Yorkshire, published by order of the Board of Agriculture;" York, 1812, 8vo. The report occupies 332 octavo pages, with a short introduction; the plates are of beehives, coloured vetches, gates, ditches with banks, hand tools and farming implements. The author is abundant in the praise of paring and burning as a means of

improvement in the proper cases, where by no other known way could crops of any kind be obtained. Equally just views are expressed on all practical matters and mentions the magnesian lime of Doncaster being inimical to vegetation, but does not express any opinion of the cause of the damage. He quotes Tennant's opinion, which admits an easy demolition.

The subject of manures is very concisely discussed, and such articles, cost and merits accurately stated. The cattle of Holderness are examined in the merits and defects, and the qualities defined. The horses of that country are a most peculiar article of observation. The author recommends the enlarged cultivation of potatoes, as a ready means of promoting labour and the quantity of food; also stall-feeding of animals during summer and winter. The work shows an educated mind, scientific and practical, free and unfettered, not flying aloft on airy phantoms, nor manacled by the dogmas of practice. A high position must be conceded to the report among works that embrace the same matters of comment.

CCCLXII.—Hunt, 1812.

John Hunt, surgeon, wrote "Agricultural memoirs, or history of the Dishley system, in answer to Sir John Sebright;" London, 1812, 8vo., price 5s. "Anatomical reflections on the formation of animals, and the new opinions of Henry Cline, Esq., surgeon;" London, 1806, 8vo., price 5s. The National Library does not contain these works, nor the author's name, though he published several professional books, and a large work on ornithology with 60 plates coloured. The author may have lived in Leicestershire, as one work is printed at Loughborough. Loudon's list of authors does not mention the name or books; the sole authority rests with the Bibliotheca Britannica, from which the above statement is taken.

Scientific men always follow in the wake of practical doings, and after something has been effected by the unerring guides of observation and experience, they commence to explain the principles on which the process is founded. Though this knowledge is but little progressive, and shows a powerless possession, yet the reading of ideas is always useful that relate in a learned way to an important purpose. The writings of this author must have been interesting, and may have illustrated the past, if they did not promote the future. The managers of the National Library show a blameable laxity in not enforcing the power given by the legislature, of having sent to their repository a copy of every book that is published in the United Kingdom. The remissness is very hurtful, and posterity will not fail to regret the loss of the exertion.

CCCLXIII.—Bald, 1812.

Robert Bald, civil engineer, wrote "General view of the agriculture of the county of Mid-Lothian;" 1812, 8vo. This statement appears in the Bibliotheca Britannica; Loudon's list of authors does not mention the name, and the book is not found in the National Library, which contains the work by the same author on the coal trade of Scotland. The two works seem to have been published at the same place, and one book sent to the National Library, and the other withheld; a negligence much to be regretted, which deserves to be noticed in every occurrence. A national repository having been appointed, and an act obtained that a copy of every book be sent to it, it remains that the intentions be fulfilled.

CCCLXIV.—Singer, 1812.

Rev. William Singer, D.D., minister of Kirkpatrick, wrote "General view of the agriculture, state of property, and improvements in the county of Dumfries;" Edinburgh, 1812, 8vo., price 18s. Drawn up under the direction of the Board of Agriculture, and at the request of the landholders of the county. The report forms an octavo volume of 696 pages, with a map of the county, small and indistinct, some portraits of implements that are well known, and two representations of irrigated meadows. Two portraits are given of an Ayrshire bull and cow; mere caricatures, to show the great inferiority of the Scotch to the English artists, much more in living bodies than with inanimate representations. This distinction prevails at this day. The work of this author is large and voluminous, and contains much useful description. A geological section is given to represent the mines of the county, which are are contained in the interior hilly part of the county, where the formation approaches the underlying primitive. The county presents materials of a large work; the low grounds and the sandstone, the slopes and undulations, and to the mineral springs of Moffat issuing from the rock of compact greywacke; the surface is very much diversified, and contains a large variety of substance. The author has well comprehended them all, and seems more at home on scientific matters, than upon practical objects. As it is, the survey has been deservedly reputed.

CCCLXV.—Henderson, 1812.

Captain John Henderson wrote "General view of the agriculture of the county of Sutherland, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement: to which is annexed a particular account of the more recent improvements of the county;" London, 1812, 8vo. "General view of the agriculture of the county of

Caithness, with observations on the means f its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement: with an appendix, including an account of the improvements carried on by Sir John Sinclair, Bart., on his estates in Scotland;" London, 1812, 8vo., price 15s.

The last report fills a volume of 371 pages, of which a large part is *addenda*, and the following appendix occupies 222 pages. Drawings are given of the improvements in the harbour of Wick, and of the intended erections in the town of Thurso. The matters are all well described; but the arrangement of the volume is clumsy, though the contents are unobjectionable. The map of the county is coloured into the different soils of clay, loam, sand, heaths, waters and lakes. The survey of Sutherland occupies 238 octavo pages, with a plain map of the county, showing the mountains, lakes, rivers, and the narrow strips of clay and loam, which form the arable grounds by the sides of rivers. The drawings are several, of old towers, Dunrobin Castle, and of a farm steading.

The report is much more condensed than the former survey, but the appendix is still long. The two works are very creditable.

CCCLXVI.—Little, 1813.

John Little wrote and dedicated to the Selkirkshire Agricultural Society, "Practical observations on the improvement and management of mountain sheep, and sheep farms, also remarks on stock of various kinds;" Edinburgh, 1813, 8vo. The work fills 198 octavo pages, describing the site of farms, enclosing, draining, bridges, shelter, burning heaths, shade, clipping, weaning, smearings, duties and qualifications of shepherds. The breeds of sheep are briefly mentioned, and the merits settled. Sheep-farming in Cardiganshire; diseases of sheep; railways, and general observations.

This small volume is written from the identical practice it describes, which raises a merit wherever it exists. The author had been a shrewd observer, and a steady practitioner, who had extended the circle of his knowledge far beyond the range of the visible horizon. His observations reach to the most improved localties of animals and arable land, and he discusses the merits and drawbacks of breeds and practice with much justice and impar tiality. The divisions of the matter are rather many; but the subject of each is concisely treated, and satisfactorily dismissed. The miscellaneous observations occupy 50 pages, and to some persons will appear to be the most valuable part of the volume.

CCCLXVII.—Thomson, 1813.

Rev. James Thomson, minister of Eccles, in the county of Berwick, wrote "Sketch of the present state of agriculture in the county;" in Thomson's Annals of Philosophy, i., 260, 1813. The work fills about 11 pages of octavo size, and has been very properly called a "sketch," for it describes merely the practical facts and doings, without one scientific observation, a suggestion, or any pro-spective remark. It is much the weakest thing that has come under our notice, and its admission into the Journal of Dr. Thomson, one of the scientific luminaries of his age, does seem wonderful, if not altogether unaccountable. Dull practice does ever require some illumination.

CCCLXVIII.—Moubray, 1813.

Bonnington Moubray, Esq., wrote "A practical treatise on breeding, rearing, and fattening all kinds of domestic poultry, pheasants, pigeons, and rabbits; including an interesting account of the Egyptian method of hatching eggs by artificial heat, with the author's experiments thereon—with additions on breeding, feeding, and management of swine; on milch cows for the family dairy; and on bees, from memoranda made during forty years' practice; London, 8vo., 1813. The work is an octavo volume of 312 pages, in seventeen sections —various species of poultry; qualities of flesh; gallinaceous fowls; aquatic birds; breeding and rearing chickens; treatment of breeding stock; hatching brood; hatching eggs by artificial heat; pheasants; feeding and fattening chickens; turkeys; pigeons; rabbits; diseases of poultry and pigeons; swine in the breeding, rearing, fattening, and curing for bacon; milch cows; bees.

This work was long esteemed the best on the subject which it treats; many others have since appeared, and it has sunk from view. The work is deficient in not giving designs of poultry and pigeon-houses, showing the accommodations necessary to effect to the recommendations of the breeding and treatment. The artificial hatching of eggs in Britain went along with the Merino sheep; our climate does not endure the application. The Merino sheep could not be fed, and the chickens from the artificial heat die under the chills, damps, and rains of Britain.

The author has certainly had very much knowledge of the subject, joined with an acute observation, and the intelligence is very plainly conveyed. The work is truly practical, and as the preface informs us, was regulated by a stud book of pedigrees. This useful fancy may in any case be combined with the strictest utility, and if it does much advance the value of the system, it adorns the practice, and embellishes the course. The farmer may not have leisure or inclination to perform the registry; it may not be necessary in his case, but

the amateur does well in such employments of time and occupations, and amateurship has been reduced into many adopted practices.

CCCLXIX.—Davy, 1813.

Sir Humphrey Davy, Professor of Chemistry in the Royal Institution, LL.D., F.R.S., V.P.R.I., F.R.S. Edinburgh, M.R.I.A., was born in 1778, in the small town of Penzance, in Cornwall, where his parents were humble, but very respectable. In the town of his birth, and in Truro, he received a grammar-school education, and was noticed for a ready acquirement of knowledge from books. His father dying, our author was apprenticed to a surgeon apothecary, who afterwards became a physician. He very early showed a prying disposition into the nature of things, and was not long in arresting the attention of scientific persons, who could appreciate the signs of his eminence.

He was transported to Bristol, as superintendent of a chemical institution. In this sphere, he laboured so effectually, that he was appointed lecturer to the Royal Institution in London, on its first foundation. In this situation, his discoveries were numerous in the higher branches of the science, and have raised his name to the very pinnacle of renown. Electro-chemical action was his forte, and he raised the knowledge on that point to a very high pitch. He was knighted, married richly, and was in very comfortable circumstances. He travelled in France quite safe under the special protection of the Emperor, who ever cherished the sons of science, and was well received by the French philosophers. He visited the North of Italy, every moment and in all places engaged in scientific pursuits. In 1816, he invented the safety lamp for the use of coal-pits, and continued his unremitted labours in science. In 1820, he succeeded Sir Joseph Banks, as President of the Royal Society, and held the office for a few years. In 1826, his health declined, and he could not enjoy the relished employments of shooting and fishing. He went abroad in 1827, to the North of Italy and the Tyrol. He returned to England and left it for ever in 1828. He went by Laybach to Rome, removed to Geneva, and died there in May, 1829, and was honoured with such a funeral as the State where he breathed his last could bestow.

Neither the illustrious professional character of Sir Humphrey Davy, nor his personal character of pique and presumption, do at all affect our simple narrative; he is known to the agricultural world by his work entitled "Elements of agricultural chemistry, in a course of lectures to the Board of Agriculture;" 1813, 4to., 42s.; second edition, 8vo., price 18s. The book enjoyed some little popularity, but scarcely added anything to our previous stock of knowledge. It was hailed as a grand beginning; but nearly half-a-century has not shown any advancement. And this deficiency may not be owing to any lack of exertion, or remissness in using and connecting the knowledge that exists on both sides; but from the impossible nature of the employment that has been projected. Agriculture and chemistry are connected in the single article of manures only; the other uses are very widely different. A dissertation on trees, in the epidermis, bark, pith, leaves, and medullary rays, adds nothing to the management of the growing vegetable, nor to the mode of cultivation, or the use of the timber. And so with the cultivated plants of the farm, and also with manures; every art has its own peculiar philosophy, and is advanced by its own observations and experience. But this seeming impossibility of connection may not hinder the attempts being made, as the praise-worthy labours may alight upon some fortuitous discovery, or elicit some slight appearance, which may swell into an ample compensation for many provoking miscarriages and aggravated misgivings.

CCCLXX.—Murray, 1813.

Adam Murray, land surveyor and estate agent, wrote "General view of the agriculture of the county of Warwick, with observations on the means of improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 8vo., 1813, price 8s. This work had escaped the search of the Bibliotheca Britannica, and is not found in Loudon's list of authors, which does not enter all the county reports. Our notice comes from the King's Library in the British Museum. The book is an octavo volume of 187 pages, with a coloured map, but no plates; the contents are arranged in the usual way, and there is no appendix. It is a concise and very sensible performance, and rigidly practical. The author most judiciously observes "that Britain may import corn, but must produce flesh, and that the rents must chiefly come from animals." Present experience fully bears out the truth of the very sensible remark.

CCCLXXI.—Walker, 1813.

W. Walker wrote "An essay on draining land by the steam engine, showing the number of acres that may be drained by each of six different sized engines, with prime cost and annual outgoings;" London, 1813, 8vo., price 1s. 6d. This book is not found in the National Library: the above statement appears in the Bibliotheca Britannica, and Loudon's list of authors makes a short notice of the name. It may be supposed that the author's plan collected the water to a corner or low position, whence the water was raised by pumps, and thrown

over a barrier, to prevent its return from an outlet in a river, ditch, or brook. It is an effectual method of getting rid of water, where a level position renders difficult the egress of the fluid. By this means, any lands may be drained in whatever way the grounds may be placed; and by its application no water need be allowed to inflict any injury by stagnation, or by being stopped in the egress by reason of the want of declivity. It requires embankments, behind which the waters are assembled, and to prevent the return of the water after being thrown over the barrier. The dykes must be strong and durably executed.

CCCLXXII.—Leslie, 1813.

Rev. William Leslie, minister of the parish of St. Andrews, Stanbryd, wrote "General view of the agriculture of the counties of Moray and Nairn, with observations on the means of their improvements drawn up for the consideration, of the Board of Agriculture and internal Improvement;" London, 8vo., 1813, price 14s. in boards. The work fills above 500 pages and is one of the best arranged of the many county reports that were written for the Board of Agriculture. The map of the two counties fronts the title-page, and on a scale which gives a clear view of the district which is described. The chapters reach to eighteen, beginning with the geographical position, and ending with miscellaneous notices. The intervening contents are most judiciously discussed, and show a very intimate knowledge of the matters that are entertained. Portraits are given of the circular harrows that were used in the olden times, the only specimens that have appeared during our agricultural research. The teeth, of timber, are ten in number in each harrow, and are arranged at equal distances around the circumference of the circle; each harrow is drawn by one horse. The author delineates in a very satisfactory manner the condition and advancement of agriculture in those counties where the cultivation of turnips has been carried to a high extent. Both the soil and climate are particularly favourable to the turnip plant.

DRAINAGE.—ORDNANCE MAPS.

A very compendious system of draining is recommended by some who consider themselves great authorities. It has been called, not inaptly, the grid-iron system. "Commence," they say, "your drains parallel with whatever fence is in the direction of the fall of the surface; make them four or five feet deep, and cover the field with them at regular intervals of eight or ten yards, according to the nature of the soil." This may be a very convenient system for drainage inspectors, or for those agricultural engineers who are gifted with the powers of ubiquity ascribed by the celebrated Sir Boyle Roche to a bird, which enable them to superintend the drainage of a hundred estates at once, in distant countries, by running to them in succession for a day or two at a time. It is an expensive system however for landowners, if for the sake of simplicity and uniformity it employs more drains than are necessary; though probably less expensive in the long run than draining under the superintendence of a bailiff or a gamekeeper or a tenant, on no system at all, or on some fanciful theory of their own, dignified with the name of practical.

Cheap and efficient drainage requires close and constant inspection, and a minute preliminary examination of the condition of the land. Amidst the many fallacies which have acquired currency on the subject of drainage, the obvious truth appears to have been lost sight of, that the laws of hydraulics under which the operation must be conducted are well known, and that the question for solution is, how to apply them to the varying conditions of each particular case. One of these conditions is the form of the surface—that is, of the variations of level in different parts of it. Another is the depth and composition of the soil and subsoil, whether they are homogeneous, or whether they consist of many irregular alternations of porous and retentive beds. The form of surface should be determined by laying down on an accurate map contour lines, that is, lines of equal height: we have then a map which is equivalent to a model of the ground. Information on the second point is only to be gained by digging numerous trial holes, marking their situation on the map, and recording concisely by conventional signs the facts which they disclose respecting the composition and depth of soil and subsoil, the depth at which water in that soil begins to weep into the hole, and the height to which it rises.

As regards accurate maps of their estates, the landowners of Lancashire and Yorkshire (Ordnance maps, of which on the scale of six inches to the mile, and showing the boundaries of fields, have recently been completed) enjoy advantages which are not possessed by those of other counties. The whole of those of Lancashire have been published in 119 sheets. Yorkshire is completed in 301

sheets, of which 64 are published. The dimensions of a full sheet are three feet by two feet. It consequently contains 24 square miles, or 15,360 acres. The cost of such a sheet is 5s. In those cases—though such must be very rare - in which the sheet consists wholly of one property, the landowner will obtain a very superior map of it at the insignificant cost of 64 acres for a farthing. Supposing that his estate extends into four sheets, his map will cost him just one pound; and for five times that sum he may have five copies of an excellent map, on which may be recorded, and brought into one view, a variety of information, the knowledge of which is of the utmost importance on a well-managed estate. These Ordnance maps of the two counties before mentioned are on the same scale as the Ordnance maps of Ireland, which were found sufficient for the purposes of the tithe commutation and the poor-law valuation. Compare the cost at which, as we have shown above, such maps may be purchased of the Government, with the expense of the piecemeal construction by local surveyors of the English tithe maps—the best of them confessedly inferior to those of the Ordnance survey—and see how much the landowners sacrificed on the tithe survey for the sake of local patronage. For the Government boon above-mentioned, the landowners of Lancashire and Yorkshire have to thank the British Association for the Advancement of Science: it was on their suggestion that the six-inch scale of the Irish survey was extended to the mining counties of England not already mapped.

This is not the only instance in which the mining interest has received more of the Government patronage than the agricultural interest. Why should we have a Government School of Mines, if we are not to have a Government School of Agriculture—that is, a school for instruction in the sciences useful to agriculture? If my property is situated in a mining district, I can purchase from the Govenrment an excellent map of my estate for 5s. a sheet. If my property is purely agricultural, they will only furnish me with a map on the scale of one inch to the mile—a scale useless, except for topographical and military purposes—and for this I must pay two-fifths of what my Yorkshire friend pays for his six-inch sheet. What is the reason of this? Is it the apathetic character of the agricultural interest, and the passiveness with which, as Sir Robert Walpole said, they submit to be shorn? or is it their jealousy of Government interference? Is the mining interest more dependent on the aids and appliances of science, or is it better able to appreciate them?

In one respect, the six-inch Ordnance maps of Yorkshire and Lancashire are deficient. They have not contour lines. They constitute, however, an admirable basis on which to lay them down; and if it should cost the proprietor a shilling an acre to lay down contour lines on their estates at every ten feet of elevation, it would be money well expended. So would another shilling an acre for an investigation of the depth and composition of the soils, subsoils, and substrata, executed by competent persons, and recorded on a map in connexion with the levels. By means of the two combined, this outlay of two shillings would, in most cases, save at least ten times that sum by securing effective draining without a superfluity of drains, which, after all, do not always insure efficiency.

It is right that the landowners of England should know that it is not intended to make any more Ordnance maps on the six-inch scale. The Government grew tired of the expense. In Scotland, where several counties have been mapped on that scale, it is likewise proposed to discontinue them. The Scotch, however, are sufficiently alive to their value to agitate for the mapping of the whole of Scotland on that system; and we have no doubt they will carry their point. So would the landowners of England, if they took the matter up in earnest. It does not follow that all the details need be executed by the Ordnance surveyors; it is only necessary that they should execute the triangulation, and determine the elevation of certain points. The filling in of the details might then be performed, by contract, by professional surveyors and engineers—of whom there are plenty competent to the task—under the supervision of the Ordnance survey. In this way the work might be performed with sufficient rapidity to be useful to the present generation, which will not be the case if only the corps of Sappers are to be employed. England is the richest country in the world, and its area is not very great. We ought therefore to have constructed, by the Government, a map of it which shall be inferior to those of no other country. Except for Lancashire and Yorkshire, we have nothing to compare to the Ordnance survey of Ireland.

THE STORING AND PRESERVATION OF MANGOLD WURZEL.

The period of storing or graving.—The month of November is the latest period to which the storing of "Mangold Wurzel" should be deferred; but it is notwithstanding the most advantageous time for so doing, taking all circumstances into consideration. In the month of October (particularly in a season like the present) very few crops attain their full maturity—their most productive and fullest growth; and as the month of November is the most proper season for securing this crop, it ought to be left till that period arrives, unless it shows unmistakeable signs of ripeness. This is evidenced by the falling off of the leaves, or by the majority of them having turned to a bright yellow or orange-colour—these are the principal signs of fitness for storing. I should as soon think of storing potatoes or apples before attaining their full growth or ripeness as mangold wurzel; in neither case can they be expected to keep well through the winter: they will undergo considerable fermentation, and most probably great loss will be the result, which a timely caution and patience will prevent. If the weather in the month of November should continue fine and open, the crop will still slowly progress, and the best judgment of the farmer is then requisite to decide his course. The chances are that his crop may be injured by severe frost, or by storing too early, or whilst the juice or sap is in full activity. A slight frost, under cover of a good leafage, will not do much harm; and even the injury likely to be sustained from a severe one, may be in a great measure obviated by allowing the crop to stand sufficiently long to allow the sap or juices to flow again throughout the root; but as soon as this is attained, the sooner it is secured the better. The farmer will often have to choose between an unripe crop and an uncertain season, and he must act in such case upon the dictates of his best judgment. I think the balance is generally in favour of storing an unripe crop, because the covering applied to the roots or graves may in a great measure be so regulated as to give sufficient ventilation and yet secure them against any ordinary frost. By all means choose dry weather if possible.

The mode of taking up.—This will mainly depend upon the method pursued in putting in the crop. If the crop is planted in rows, it is more readily accomplished than upon any other plan; and if upon the ridge system, all the better. It is a very common practice to depasture the tops by feeding them off with aged or toothless ewes: the course is good in many cases, but it involves the stocking of them too early, and thus diminishes the bulk or weight of crop. Another practice is to strip off the tops, and lead them on to other lands, to be there eaten by cattle, sheep, and pigs: this is good—perhaps the best and most profitable course to adopt for their consumption, and in this case it is not necessary to commence before the crop is ready for storing, when the whole process may go on simultaneously, taking care to collect a sufficient number of stock to consume them before they decay. Another practice is to pluck off the leaves and drop them where they grow, and subsequently plough them in as a green manure. This also is a good practice, and which no farmer need hesitate to adopt, providing he does not require them for food. I would, however, as respects the tops, observe in fine that they must be stripped off, and cleanly taken from the root by hand or otherwise, and without cutting or in any way injuring the root, so as to cause it to "bleed," and thus render it very liable to ferment in grave, and rot.

Having disposed (I trust advantageously) of the leaves, I will now point out my own practice in taking up this crop. With Ransome's universal ridge-plough, adjusted as a skeleton-plough, we plough up the rows, or rather pass the skeleton share under the rows, just taking off the tap-root, and leaving the root itself standing precisely as it grew. The carts pass down between the ridges, and the roots are thrown in by hand from either side, taking about eleven or twelve rows each time: they are led to a convenient place, and packed or graved in lengths; the bottom of the grave is from seven to eight feet wide, narrowed off on both sides till they meet at the top, and at the height of about five feet, or occasionally six feet, according to the condition of the roots: the drier and cleaner the roots, the larger we venture to make our graves. As night approaches they are carefully thatched down with straw or stubble, and in this state they are left till the season gives evidence of approaching frost, when they are well earthed up from trenches cut on either side to within one foot of the top, and finished by as thick a covering of stubble as can be made to lay on with safety: this straw covering, if well done, gives space for ventilation, whilst it prevents injury from frost, however inclement. Neither fork nor spade is used in taking up, and every crushed or injured root is thrown aside for immediate consumption: it is the height of folly to have or employ the fork in filling the carts; every punctured or otherwise injured root is almost certain to rot in the grave.

I adopted the above course after long and mature

consideration, believing it to be the best mode of storing roots: it is not either new or novel, but is more generally followed than any other mode; and as this no doubt is the result of long-tried experience, I hesitate not to give it my best recommendation.

Another mode of storing is to place hurdles in double parallel rows, about eight feet and two feet apart, and fill up the smaller space with straw, stubble, sedge, fern, or other similar material; the carts are backed into the larger space, and the roots are deposited therein, and subsequently covered over with the like strawy substances. This is practised in districts possessing but little depth of soil, or where plenty of sedge, fern, &c., is near at hand. Another mode is to place them in graves similar to the first-named, and simply cover them with mould or soil; this keeps them in better natural condition than in any other way, providing they are got up clean and dry, and the earth used is mild and easily broken, so as to fill up the interstices between the roots; the danger is in preventing a sufficient ventilation, and the top in this case must be left open during fine weather, before finally earthing up. Another mode is to cover this kind of graves with haulm or straw only; this is a very safe practice; but when much is grown, it takes a large quantity, as it is requisite that the covering be at least three feet in thickness, and be well trodden down; otherwise the frost in winter and the dry winds in the spring will injure the roots. This appears to me to be the mode which will best preserve its most valuable constituents; the proportion of sugar is increased in the root if it can be kept quite free from fermentation on the one hand, or drying too rapidly on the other. Many other plans are adopted, such as providing large store-houses or hovels, and the like, purposely for storing roots (this is a good practice, providing sufficient ventilation is secured—the casting in the roots is tedious and expensive); throwing the roots into heaps on the land where grown, and partially covering them, either by leaves for immediate safety prior to removal, or by earth for more permanent security.

I would observe in conclusion, and I beg to call especial attention to the remark, that on the return of mild weather, every heap, under whatever covering, will commence growing; and consequently, if sufficient air or ventilation is not immediately given, fermentation will take place, and destruction from rot will be the certain result. P. F.

IMPROVEMENT OF AGRICULTURAL STOCK.

Attention is now daily becoming more and more directed to the improvement of our different breeds of stock. The move promises to be something like a general one, in place of the partial and exceptional success hitherto achieved in this important branch of the business of the farm. It is true, perhaps, that we may never hope as a body to command the extraordinary and somewhat artificial prices that have stamped the value of a Duchess tribe; no more than we can expect year after year to secure such biddings as attend the letting of a Babraham flock. We may still, however, do better than we have done, and make our cattle and sheep a fair item on the profit side of the account. There is the inducement of a ready market, and the precedent of a liberal customer to lead us on, while every opportunity is being afforded to procure the material to meet these with. The agriculturist is beginning to own at last that the breeding and keeping of stock may turn out something better than the necessary evil, or negative good, he has too long accustomed himself to consider them.

We may in some measure trace the progress of this feeling by the increasing interest manifested at the different exhibitions of stock. It is not merely a known locality or a famous name which attracts. In all districts we have the people, of almost all classes, keenly alive to the advantages of such displays, as gradually the more inclined to turn them to a useful account. The breeder is at length to be more consulted than the butcher, and the properties of a really good animal to be made the most of. Advancing in this direction, and encouraged by the support which has been given to their Christmas show, we find the Council of the Birmingham and Midland Counties Society have now determined on a summer exhibition of breeding stock. With a proper discretion, founded on the comparatively limited field of their operations, this will, however, be only a triennial meeting, instead of the migratory one which we believe was at one time contemplated. The prize sheet, already issued for the gathering of 1854, appears to be well considered; although we might perhaps have wished to see the premiums generally a little higher. The first prize, for instance, in roadster stallions is but fifteen pounds, and the same again for the best hunter. Bearing in mind how well Birmingham is situated, the summer show might come to be as distinguished for these superior breeds of horses as the winter one so long has been for its varieties of poultry. The hunter and roadster at least might have been as high as that given to the best horse for agricultural purposes, and this is only five-and-

twenty pounds. From the Royal Agricultural Society downwards, we believe many of the premiums are not good enough. We can recollect when the Highland Society gave fifty guineas to the best draught-horse. Are there any which do as much now?

Still the Midland Counties' summer show must be considered but as a beginner, and we trust to see it live on to do more than it may yet have the means to promise. In some respects its arrangement is peculiar, though we are in no ways inclined to quarrel with the originators on these grounds. The experiment of breaking a little from the old routine may at any rate be worth the trial, while the alteration here reads very like an improvement. It is thus briefly stated in the programme to which we have already referred :—

"The Council, in establishing a second exhibition, are desirous of encouraging the improvement of agricultural stock generally, and the prize list is framed so as, in their opinion, to be well calculated to promote this object. *Young stock* only will be eligible to compete for prizes; and this principle, which forms the main feature of the list, appears to the Council to be absolutely necessary to give to these meetings a strictly practical and useful character. The mere *exhibition* of stock which is not intended for *sale* has produced no beneficial results, and the Council have therefore determined to invite breeders to show such animals as they would in most cases be prepared to *sell;* the number of *sales* supplying the only proper test of the real value of each exhibition."

Strongly as this is put, and commendable as is the aim, it is questionable still whether the selling regulation does not impress something of a truism. Are not breeders, as it is, "in most cases" prepared to sell, if they can get their price? The Council feel this as they go further into the subject, and find that this price after all must beat them if the breeder so wishes it :—

"Exhibitors will be requested in all cases to state on the certificates the price at which they will sell the stock entered for competition, and the amounts named will be printed in the catalogue. A prohibitory price may of course be fixed, if the breeder or owner is disposed to retain the stock in his own possession."

However, let it be provisionally registered as a sale show—a show of animals to be sold by their points and pedigrees, instead of at so much a pound. The limited age of the stock to be entered must in some degree facilitate this, while we are assured there shall be "such regulations and instructions to judges and stewards as shall lead to the correction of an evil so much complained of—namely, the over-feeding of stock intended for breeding purposes."

We cannot but congratulate the management of the Midland Counties' summer show so far on their arrangements, and wish them accordingly every success in the attainment of their object. In arriving at this, still let them think not merely of themselves and their own meetings. As the scene of an agricultural exhibition, Birmingham made a false move to begin with. This was putting their show in direct opposition to that of the Smithfield Club. Fortunately for both societies, this is now remedied. Let us have no such mistake with the triennial meeting. A very little forethought may provide a clear week, and the public generally—the liberal buyers, remember, after all—thus have the opportunity of visiting each collection in turn. We may commence with the West of England at Bath; then on to the Midland Counties at Birmingham; in close succession comes the Royal Agricultural at Lincoln; with the Yorkshire, Irish, and Scotch societies in due order—and all, thus, with best opportunities for making the most of that they have to show, and to *sell*.

WAR IN THE EAST.—ITS INFLUENCE UPON AGRICULTURE AND THE CORN MARKETS OF EUROPE.

"While there is life there is hope," it is said; and although it is "hoping beyond hope" to suppose that Russia will accept the terms of Turkey, it is yet possible that she may pay more respect to the determination of England and France, and accept their terms either before or after her Black Sea and Baltic ports are blockaded by the allied fleets. But although this is possible and even more than probable from the conduct of the northern powers, who appear to understand each other on the Turkish question; yet, at the moment we write, war appears more in accordance with general opinion than peace, and, therefore, for the sake of argument, let us suppose that we have it in the fullest sense of the word. Let us suppose not only that war has commenced, but that it rages with all its disorganizing influence upon the industrial resources of the Danubian provinces and others involved for the next twelve months; that the Russian ports of the Black Sea and Baltic are in a state of blockade; that Admiral Dundas either sinks or captures the Russian fleet; that the English and French flags float merrily on the ramparts of the Crimea and Caucasus, and any other thing which our warlike readers may suppose; all this is possible, and a great deal more. Supposing, therefore, we say, that it had actually taken place, what would be its effects upon the agriculture of those provinces thus involved in all the horrors of war, and upon the commerce of corn in western Europe, and indeed the agriculture and commerce of the whole world? for nations are now so bound together by ties of reciprocity,

that a breach in one affects the whole. As English farmers, millers, &c., the question comes home to us in this form —How will war affect our agriculture and corn trade? We are now beginning to thrash out crop 1853, and to seed the ground for wheat crop 1854. How will it affect the price of the former, and breadth of the latter?

In discussing a question so comprehensive, we must, for the sake of brevity, divide it; first noticing crop 1853, and second by crop 1854.

1st: Crop 1853 is now secured, or nearly so; consequently war cannot have any effect upon the quantity or quality of it. Along with any balance of crop 1852, it falls now to be considered as stock on hand. With the actual quantity of corn on the seaboards of the Black Sea and Baltic, and in the barns of the farmers of the inland provinces, we have nothing to do beyond the fact that it considerably exceeds the consumption of ordinary years. The only question which we have got to discuss, is the difference of consumption and disposal of corn under war, from that under ordinary years of peace. There are, we shall suppose, about 500,000 armed men fighting in the Danubian provinces, 250,000 Russians against 250,000 Turks, besides a long train of cavalry and artillery horses on each side, all consuming corn. If we suppose the latter shoot the former, just half the corn will serve (?) but so long as the Danube remains between the combatants, there will doubtless be an increase of consumption on either side. At the same time the consumption will not much exceed what it would have been had men and horses been peacefully employed at home. A Russian soldier, for instance, will not consume much more in the valley of the Danube than in the valley of the Dnieper or Don; and when we consider the fact that his bread-corn is principally rye, oats, and Indian-corn, the quantity of wheat for export to the English market will be very little affected, unless by the blockade, and any steps which Turkey and Russia may take to prohibit exports—points which we shall consider separately, and very briefly, thus: First, Turkey "it is rumoured" (quoting a corn-report from Galatz) has already prohibited the exportation of corn from the southern provinces of the Lower Danube. But this, supposing it to be true, will not much decrease her general exports of wheat, including Egyptian; for, if she has increased the consumption of those provinces, she has decreased that of others more remote from the theatre of war: hence the conclusion. Secondly, with regard to the blockade of the Russian ports, and its effect upon the export of corn to the French and English markets, let us not be imposed upon by visionary ideas; for here, it must be remembered, the blockading parties are those requiring the corn; so that the practical question resolves itself into this —Will England and France commit suicide? That they will blockade the ports in question may readily be granted, excluding the export of every article which they themselves can do without; but if Danzig and Odessa are overflowing with wheat, we shall have more difficulty in believing that London and Paris will starve for the want of bread! That a blockade will lower the price of wheat at all the blockaded ports is more than probable; indeed, the moment it was known that the Czar had rejected the Sultan's modifications of the Vienna note, wheat is reported to have fallen from 7s. to 8s. per quarter at Odessa (see *Mark Lane Express* of Oct. 3, under "Review of the Foreign Corn Trade," p. 1)—a state of things which leaves the conclusion obvious—England and France will get wheat on easier terms under a blockade than with open ports, *if they choose.*

Russia, it may be said, will prohibit the exportation of corn, in order to make provision for deficiency of crop 1854, so as to render a blockade, so far as corn is concerned, nugatory.

It is probable that Russia may export less rye, oats, and even Indian Corn from the Black Sea than usual, such being the bread corn of her people; but it is otherwise with wheat should England and France agree to accept it or require it. Over the stocks of corn already on her sea-board (in quantity exceeding the whole of her exports of last year) she will have little control; and if her other exports, such as tallow, are prohibited, the want of capital will make her glad to get rid of her wheat on ordinary terms. She is differently situated in this respect from England and France, who have capital within themselves to carry on war.

From each of these views of the question it may, therefore, be stated as a general conclusion that war between Turkey and Russia will exercise but little influence upon the price of wheat (crop 1853) in the English market—a conclusion which will appear still more manifest when we consider the fact that our imports of wheat from Russia are likely to be less than those from Canada, without a blockade; the average imports of the last six years being little more than half a million quarters yearly from the former, while 1,000,000 qrs. qrs. are expected from the latter.

2nd. Twelvemonths' war may affect both the quantity and quality of Russian and Turkish exports of corn (crop 1854), not only from the Danubian provinces (the immediate theatre of war), but from all the exporting provinces of both empires; for, from the manner in which both parties are allowing themselves to be the slaves of religious fanaticism, the cultivation of the soil may actually be neglected. Under such circumstances crop 1854 will doubtless be deficient; consequently it would be no more than prudent on the part of the other European states, and also America, to bear this in mind in putting this crop into the ground. If the weather continues wet as at present, many clay soils may, no doubt, be in a position similar to what was experienced last year, so that farmers will require to think of how they can turn dry lands, capable of growing wheat, to the best advantage; a question not very easily solved under any theory of regular rotations of cropping. In importing kingdoms like England there is never much risk of sowing too large a breadth of wheat, due respect being paid to cropping, so that parties generally sow as much wheat as they can. Importing too much of it, accompanied with a short supply of barley or any other crop, may sometimes reduce the price of the former and enhance that of the latter, so as to reverse this conclusion; but such must always be considered an exception from any general rule. It is other-

wise with importing countries growing more wheat than they require, such as America, having fresh lands to break up. If Russia and Turkey fall short, say 2,000,000 qrs. wheat next year (a very small decrease upon their crops), Europe, or we may say England, will require an increase of Transatlantic wheat. Hence American farmers have to consider whether they should not this year sow some 2,000,000 acres extra with wheat. This, however, cannot be satisfactorily determined until the seed-time of Russia and Turkey is concluded; and, from the peculiarities of their climates and agriculture, a considerable period has yet to elapse before this takes place. But, independent of this, and every other contingency arising out of war in the East likely to affect the produce of Turkish and Russian agriculture, there is every appearance of England and the other importing states of Europe requiring more than an average supply of breadstuffs (crop 1854) from America, for the effects of wet seasons like the last are not very easily forgotten, to say nothing of two in succession. We have seen a wet October followed by a fine November, (and we hope the same may be experienced this year), affording an excellent seed-time upon the whole; and, if we farther suppose an early spring and harvest reducing the period of consumption of crop 1853 to from eight to nine months instead of nearly fourteen, as its predecessor crop 1852, it would tend to reduce the price of crop 1853 very much, and advance that of crop 1854 by Midsummer 1855, especially if crop 1854 is short and deficient in quantity as 1826, and crop 1855 late as crop 1853, circumstances which would be in favour of the American farmer. We may, on the other hand, it is true, suppose crop 1854, contrary to present appearances, both early and abundant, so as to reduce our demand and price by Midsummer, 1854 and 1855. Crop 1853 is one-fourth short; but if crop 1852 extends two months, as it will do, and crop 1854 one month, into the term or consumption of crop 1853, it will make up for this deficiency, reducing prices to the common level of 1852. The more common course of things, however, is in favour of our first hypothesis, which accords with the present appearance of the weather, and consequences of the by-gone season, viz., that we shall have an extra demand on America for crop 1854 as well as crop 1853, independent of war in the East, but increased by it.

In questions of this kind as to the propriety of laying down more or less land in wheat, according to the general prospects of the season, American farmers have the advantage of English, French, and many others in Europe, who principally sow winter wheat, for before they commence seeding the ground for their spring crops, they can form a pretty accurate estimate of the land under winter wheat in Europe, and the prospects of the following harvest. Last spring, for instance, the farmers of the great wheat-growing districts of the northern states of the Union, and also of Canada, knew, when sowing their spring wheat, that the breadth of winter wheat in England was one-fourth less than usual, that our fields were inundated with a succession of floods, and that the prospects of the bygone harvest was anything but favourable. With facts of this kind they were familiar, partly from several of them being resident among us purchasing breeding stock, but principally from the columns of our agricultural and other papers forwarded by relatives or others who take an interest in their welfare, or ordered by themselves. Our own connexions, for instance, were as familiar with the columns of the *Mark Lane Express* in Canada West, Pennsylvania, and Michigan, as we ourselves in Surrey; and there cannot be a doubt but the information they and all others derived from this source and similar had a desirable effect in making ample provision for any deficiency of crop 1853 on this side of the Atlantic; for we believe America this year has not only a fine crop, but a large breadth of it. And what was true of the past spring will be found equally so of its successor. If we have a bad seed-time, our transatlantic cousins will make the necessary provision for the short-comings of harvest, because it is their own interest to do so.

Russian agriculture is similarly situated, as to the sowing of spring wheat, as American. The late Mr. Loudon, who resided for some time in the country, states that "there is no country in Europe where corn crops may be raised at so little expense of labour as in Russia," the severity and long continuance of the winter both pulverizing the surface and destroying weeds; little more being required for spring sowing than harrowing-in the seed. In her southern provinces winter wheat is sown; but should war reduce the quantity, an opportunity may occur in spring for getting such lands sown with spring wheat so as to sustain but very little loss if the war is concluded by that time, and even whether or not. At present there is little to interfere with the sowing of winter wheat, save the fears and fanaticism of an ignorant peasantry and army, whose golden dreams of Ottoman conquest exceed anything to be found in the "Arabian Nights." In ordinary years, or during years like the past, Russia enjoys similar opportunity with America of sowing more or less land with spring wheat, as circumstances may advise. Her farmers, however, lack much of that intelligence to be met with across the Atlantic, so as to enable them to embrace favourable opportunities when they occur. Few of them, for instance, read newspapers, either home or foreign, to acquire the information in question. But for all this, science is rapidly progressing, for not a few nobles; the mainsprings of Russian agriculture, do read books and newspapers, doubtless profiting by the information they afford.

We can hardly pass over the subject of the last two paragraphs without noticing the wisdom and economy displayed in the providential arrangement of the different climates of the world, especially since so ample a provision is made for the many wants of our own isles; for if the seasons are unpropitious for the cultivation and seeding of our fields, and for the growth and maturity of the staff of life, others, under a different climate, familiar with our state, are enabled to make up for all our short-comings; fulfilling the promise that seedtime and harvest should never be wanting to the human family; making England's cup overflow

with plenty, even while she herself is severely chastised for her non-drained acres!

We arrive therefore at the conclusion that war between Russia and Turkey will have but little influence upon the agriculture and corn markets of England, or Western Europe, either as to the present crop (1853), or succeeding one (1854), America making up for any short-comings of the Danubian provinces. Should the Principalities be occupied for twelve months under offensive operations, there cannot be a doubt but they will experience a deficient crop next year, as well as the adjoining provinces of the belligerent parties; so that during 1855 the provinces of the Black Sea may require their own wheat, if not something more, if they can get it. But under war we cannot see how either Turkey or Russia can import corn so as to have any influence upon other exporting states, for want of capital, even should they require it. The blockade of the Russian ports will settle the one side of the question; on which account her ordinary exports of rye, oats, and Indian corn may find a home market this year. We are more afraid of the bad weather now experienced at home, and the consequences of last year affecting our markets, than the warlike attitude of the East; and here our transatlantic neighbours will neither neglect their own interest nor overlook ours. Bad weather and disturbances in Europe hold out very flattering prospects to them to break up a few million acres of prairie and bush lands extra to aration, and even increase the breadth of wheat on old reclaimed lands. Independent of the extra crop in America this year, the surplus corn of 1852 is likely to carry us over one-fourth of the period of consumption of crop 1853, thus balancing its deficiency, and keeping down the price, independent of crop 1854; and if the latter is early, it may appear in the market with a good stock of old wheat on hand, both in England and America. The commerce of the world is wonderfully improved since the last European war in which we were involved, and even prices will be effected accordingly. Old things are gone.—B******.

CONSUMPTION OF HORSE FOOD IN LONDON.

The following curious information of the quantity of oats brought into London in the year ending 4th September, 1853, and the comparison between the consumption of that and previous years, is very instructive. It confirms what every successive day's experience of streets more and more supplied with the convenience of omnibuses and cabs has already taught every Londoner, that the disuse of long stages, and the substitution of mechanic power for horse power as the means of distant locomotion, have added very much to the amount of horse power used for short stages. Year after year, since the beginning of the account in 1839-40, have the supply and consumption of horse food increased, and this year it much exceeds any previous year, though this year the supply has by no means been abundant, nor the price low. The great importation has not come up to the great consumption, and it will be a mistake if agriculturists suppose that wheat is the only cereal the production of which must be increased to meet the public wants.

The supplies of oats to London were (say seaborne and per Eastern Counties and Great Northern Railways) as follows:—

In the Fourth Quarter, 1852—13 weeks.

	Qrs.		Qrs.	
English, Coastwise	3,839	or weekly average	295	
,, per E. Coun. Railway	17,807	,,	1,369	3,134
,, per Gt. North. Rail.	16,115	,,	1,470	
Scotch	28,952	,,	2,227	
Irish	124,261	,,	9,558	
Foreign	146 403	,,	11,261	
	340,377		26,180	

In the First Quarter, 1853—13 weeks.

	Qrs.		Qrs.	
English, Coastwise	5,759	or weekly average	443	
,, per E. Coun. Railway	20,080	,,	1,545	3,746
,, per Gt. North. Rail.	22,850	,,	1,758	
Scotch	25 866	,,	1 990	
Irish	83,081	,,	6,390	
Foreign	113,146	,,	8,703	
	270,782		20,829	

In the Second Quarter, 1853—13 weeks.

	Qrs.		Qrs.	
English, Coastwise	7,026	or weekly average	540	
,, per E. Coun. Railway	7,229	,,	555	2,083
,, per Gt. North. Rail.	12,842	,,	988	
Scotch	16,087	,,	1,237	
Irish	91,463	,,	7,035	
Foreign	193,417	,,	14,878	
	328,055		25,233	

In the Third Quarter, 1853—14 weeks.

	Qrs.		Qrs.	
English, Coastwise	10,345	or weekly average	739	
,, per E. Coun. Railway	8,659	,,	618	2,192
,, per Gt. North. Rail.	11,689	,,	835	
Scotch	23,165	,,	1,655	
Irish	57,779	,,	1,127	
Foreign	379,944	,,	27,139	
	491,581		35,113	

Therefore, in the season 1852-3, the supplies of oats to London have been (say seaborne and per rail):—

		Qrs.		Qrs.		Qrs.
Fourth quar.,	1852	340,377			or weekly	26,170
First ,,	1853	270,782	or in 2 qrs.	611,159	,,	23,506
Second ,,	,,	328,055	,, 3 qrs.	939,214	,,	24,082
Third ,,	,,	491,581	,, 4 qrs.	1,430,795	,,	26,996
		1,430,795				

Now, the supply in the season—

	Qrs.		Qrs.
1839—40	was 989,292	or weekly average	19,024
1840—41	1,143,500	,,	21,990
1841-42	1,083,930	,,	20,844
1842—43	1,145,263	,,	22,025
1843—44	1,207,736	,,	23,225
1844—45	1,252,518	,,	24,086
1845—46	1,093,512	,,	21,029
1846-47	1,242,503	,,	23,894
1847—48	1,052,545	,,	20,241
1848—49	1,276,150	,,	24,541
1849—50	1,282,630	,,	24,665
1850—51	1,266,829	,,	24,362
1851—52	1,294,772	,,	24,889
1852—53	1,430,795	,,	26,996

The supplies for the season 1852-3 consisted of—

147,281	qrs. English oats	say 10	per cent.
94,070	,, Scotch oats	7	,,
356,584	,, Irish oats	25	,,
832,910	,, Foreign oats	58	,,
1,430,795		100	

17, *Mark-lane, Oct.*, 1853. GILLIES and HORNE.

NEW AMERICAN THRASHING MACHINE.

Whatever may be our national prejudice in favour of British customs and modes of operation, there can be no doubt that two of our most important interests, and upon which we have been in the habit of peculiarly priding ourselves, viz., shipbuilding and farming have received an immense impetus from the more progressive spirit of our younger brother of America. The clipper yachts of the United States—an improvement upon our own—have stimulated our ship-builders to leave the beaten track, and not only copy what is desirable in the American build, but improve upon the ideas thus suggested to them. Reaping by machinery had long been a desideratum in this country, but we were indebted to our transatlantic neighbours, under the stimulus of the Great Exhibition, for supplying us with the first implements of the kind ever brought into practical use in England; and although a rival for the honour of the invention, and a successful competitor in operation, has since presented itself in the Scottish portion of the United Kingdom, it is doubtful how long but for such stimulus Bell's reaper would have remained a model only, instead of taking its place among the actual implements of the farm.

Thrashing by machinery is no novelty in this country; it was almost the first step by which agriculture emerged from being a pure manual operation, and it has outlived the prejudice with which, like the spinning jenny, its first advent was regarded by those whose labour it was supposed likely to absorb. Machinery, except temporarily, or in isolated cases, has not been found to interfere with the employment of manual labour, and in the case of thrashing it has given the farmer an expeditious means of bringing his produce into a marketable shape, and so enables him to take advantage of the most favourable opportunity for disposing of it. Accordingly, besides various improvements upon the machine itself, we have brought steam power to bear upon it, and were supposed to have made as near an approach to perfection as could well be attained.

But here again America has been running a race with us: the most decided "hit" in the agricultural department of the recent New York Exhibition was "Moffit's Patent Improved Grain Separator;" and having with true Yankee expedition "knocked off" a hundred or two for his own countrymen, the inventor makes all speed to England as the best arena at once to test the merits of his invention, and to reap his reward should its superiority be established. The "Grain Separator" had no Crystal Palace, like its predecessor the American Reaper, for first making its *debut* before the English public; but the inventor wisely betook himself to that zealous promoter of agricultural improvement—Mr. Mechi; and Tiptree Hall has been the scene of its first operations in this country.

It was worked a day or two last week with horse-power, and with very satisfactory results as regards the machine itself; but Mr. Mechi, it is well-known, votes the employment of horses in such a duty a "barbarism;" and certainly the term does not seem to be misapplied when the wear and tear of eight living animals (requiring a similar relay during the day) is contrasted with the quiet but effective working of a single steam horse. Accordingly at the public trial on Monday one of Ransome's portable steam engines (nominally of 6-horse power, but only worked to about 4-horse power), the property of Mr. Partridge, of Braxted, was substituted; and the ease and efficiency with which it performed its task was a theme of general admiration. The machine thus worked turned out a bushel per minute of corn; and when fed by the inventor the bushel was filled in 50 seconds. The former, however, may be taken as the average rate; and at 60 bushels per hour, 70 quarters of corn may be got ready for market in a day of 10 working hours. The steam-engine consumes about 5 cwt of coal per day; and including the engineer, 10 men and 5 boys are required to attend to the machine, viz., two upon the stack, two to cut the bands (there being no necessity to untie them as with ordinary machines), and two to "feed;" the rest being employed in receiving and putting up the corn, clearing away and stacking the straw, &c. Reckoning the coals consumed, the men's wages at 15s per week (which we understand he is actually paying); and the boys at half that amount, Mr. Mechi calculated that the cost was only 6d. per quarter. Some further allowance must be made for the wear and tear of engine and machine, but this of course would be the case under any circumstances either with horses or steam; and from the small amount of jarring or vibration upon the framework of the machine when in operation, the comparison in this respect would certainly not be unfavourable to the "Grain Separator."

The machine is the invention of Mr. J. R. Moffit, of Piqua, Ohio, who is accompanied in England by his partner, Mr. Knight, of Cincinnati; and its peculiar characteristics are lightness, cheapness, and rapidity of work. In external appearance it is not very different to the steam thrashing-machines in ordinary use; and the effectiveness of the interior arrangement is mainly dependent upon a skilful adaptation of the principle of the Archimedean screw. The corn being thrown upon the receiving board, is caught by the iron teeth of the drum (which makes 114 revolutions per minute), and these, acting upon similar fixed teeth below, the process of thrashing is completed in the passage between them. The first novelty of the machine then commences in the method of carrying off the straw, which is effected by means of a broad belt of open wood staves, in a chain frame work, passing over rollers at either end, and having also a vibratory motion, to shake out any grain remaining among it. Along this the straw travels in a continuous stream, and is thrown over at the back.

The grain and chaff, thus separated from the straw, fall into a receiver, from which they are carried by two Archimedean screws to a riddle of oblique laths, resembling a partly-closed Venetian blind. A continuous current of air from the fan-wheel below (while allowing the corn to drop through) throws off the chaff, and carries the imperfectly threshed kernels to a receiver beyond, from which, by another Archimedean screw, it is carried back to the thrasher, there to undergo a renewal of the operation, until separation from the chaff is completed, when alone it can escape from the machine.

The clean grain having fallen through the slat riddle is carried by a fourth Archimedean screw through a rolling screen, which allows weed seed, and the "tail" to escape; and having passed this final cleansing process, the corn is put into sacks, and is ready for market.

The machine weighs 12½ cwt.—about one-third the weight of an ordinary machine of similar power; less than a harvest waggon, and little more than half the weight of a road waggon. It has not the same appearance of strength and finish as an English-made implement; but the inventor claims for it enough of the former for the purpose required, and holds the latter to be unnecessary in a machine aiming at utility irre-

spective of ornament. The result is, that it can be supplied at a greatly reduced cost, and will so be brought more within general reach.

The stack thrashed was of mowed wheat (last year's crop), harvested rather hastily in consequence of the fickle weather, and therefore in damp condition. This, it was remarked, made the trial a fairer one than with very dry corn, and the circumstance of the wheat being mowed instead of reaped was also against it.

The machine was at work altogether 4½ hours, and thrashed 31½ quarters.

The trial was witnessed by a number of practical men, including Messrs. Alfred May and Son and Mr. Beadel jun. (who were making Mr. Mechi's annual farm valuation), Mr. John Hutley, Mr. J. G. Fenn, Mr. H. T. Abrey, Mr. Sadler sen. and jun.; Mr. Moore, Mr. Wrench, Mr. Partridge (Braxted), Mr. Ransome (Ipswich), Mr. Crane, and other farmers in the neighbourhood. The general, we might almost say universal, opinion expressed was that the machine was completely successful, and an improvement upon implements of that description previously in use. The only objections raised were that the straw is more broken than by the common machine, and that the cavings (broken ears) and chaff are thrown together.

The machine occasions very little waste, and the instances of damaged kernels were very rare. Indeed the sample was remarkably even, and so good that one farmer made a purchase on the spot for his this year's seed.

The visitors experienced the well-known hospitality of Mr. Mechi in the shape of a substantial luncheon; and those who had not previously made their acquaintance, inspected the irrigation, board feeding, and other arrangements of the farm with considerable interest.

In the course of the day Mr. Mechi expressed his sanguine anticipations that his new cultivator, or "Steam Farmer," as it is proposed to call it (the invention of Mr. Romaine, of Quebec, Upper Canada, who was present), will be equally successful in its operation, and promised that a public opportunity should be given of putting it to the test.—Essex Standard.

TO THE EDITOR.

The agricultural world is at last indebted to Mr. Mechi for the facilities he so readily affords for the trial of anything and everything new, which brings with it the promise of advantage to the farmer. It seems quite in keeping with the fitness of things to find the new American "grain separator" following its congener, the reaper, to that go-ahead locality Tiptree Hall, and there accordingly, by the polite invitation of Mr. Mechi, we had the opportunity of witnessing the public trial of this new illustration of Brother Jonathan's ingenuity. We remarked, with much gratification, as showing how thoroughly awakened our English implement-makers have become to the necessity for their keeping themselves fully informed of everything progressive in their important profession, that almost all the leading firms had come, some from long distances, to see the transatlantic visitor who came to strip them of their laurels; but we have faith enough in our Ransomes, Hornsbys, Garretts, Tuxfords, and others of the well-known makers who responded to the call, to believe that some among them are fully equal to the contest heralded by this trial. The new machine is undoubtedly an excellent one, superior to any of English make in some particulars, but not equal to them in some others—certainly so far short of perfection as to warrant our belief that there is room for yet further improvement by engrafting upon it the better points of the machines now at work in our farm-yards. In one respect it surpasses any combined threshing and dressing machine we have seen or heard of: it weighs only 14 cwt., as contrasting with from 35 to 45 cwt. in similar machines of home manufacture. Again it is very steady at its work; and it *perfectly* dresses wheat, which it was thrashing when we saw it at one operation. It thrashes very clean, and shakes out all the grain from the straw, and above all, it will evidently be a very cheap machine. It is a narrow machine, not more than 30 or 32 inches wide, and has a drum 16 inches in diameter, the beaters of which are closely set with wrought-iron teeth running between similar teeth upon the concave, and is driven at 1,200 revolutions per minute, the weight of the drum being 200 pounds. From the drum the straw is delivered upon a very cleverly contrived shaker of round wood, connected by iron links, and driven by toothed pulleys, working in undulations up a considerable elevation: being endless, this shaker has a cross web working within it, which delivers at the side any long straws which would otherwise collect and choke it up. The thrashed stuff is delivered by Archimedean screws, working beneath the screen and shaker, upon an excellent riddle of new construction, through which nothing but corn passes, and the heads of corn, pulse, &c., which pass over it are collected in a trough, and taken back by the agency of another screw to be re-thrashed. The clean-dressed corn is delivered at the side by another Archimidean screw, into a revolving screen, which takes out the broken corn, seeds, &c. It thrashed upon the average of several times we tried its rate of delivery during our stay 1¼ bushels of corn per minute, of wheat of excellent yield and average length of straw, and threshing out very freely. Against its advantages we must put the facts that it completely destroys the straw for any purpose, but as litter; that it delivers straw, pulse, and chaff in one indiscriminate heap; that it breaks the corn more than the best English machines, and this damage would certainly be considerable in old grain; that it is full of geared-wheel motions, which are always troublesome from wear and breakage, and which our makers have been at great pains to get rid of; and that it is so lightly made, and in such a manner as would be knocked-up much too rapidly to satisfy the English farmer as to its eventual cost being compensated for by its extreme lightness. The justice of our comments will, doubtless, be in a very short time submitted to the criticism of the agriculturists, in whose interest we make them, as we understand the inventor, Mr. Moffat, of Cincinnati, has brought over the machine for the purpose of selling his patent right, and doubtless some of our makers will be desirous to secure so good and so improvable an implement, and we shall then see them subjected to the fullest test of experience, and in the meantime we thank Mr. Moffat for the spur which his ingenuity and enterprise will give to our manufacturers.

B.

Nov. 4, 1853.

LOIS WEEDON WHEAT CULTIVATION.

Sir,—If you will be so good as to admit the following statement of my experience of the Lois Weedon system of growing wheat, perhaps it may not be uninteresting to others who are circumstanced like myself, and farm on a very small scale.

I had carefully read and studied the principles of the system in Mr. Smith's pamphlet, "A Word in Season," and I had seen (as every one in this parish must have seen) that every fact recorded therein was scrupulously correct. I therefore fearlessly entered upon my undertaking to cultivate half an acre (superficial measure) in the same way; and I now proceed to show the results.

1851.

	£	s.	d.
Paid for digging	1	0	0
Dropping the seed	0	1	6
Six and a-half pints of seed	0	0	6
Bird-keeping	0	6	0
Thrashing and winnowing	0	12	0
Total outlay	£2	0	0

	£	s.	d.
Eighteen bushels clean wheat, at 4s. 4½d.	3	18	9
Two and a-half second ditto, at 3s. 4½d..	0	8	5¼
Fifteen cwt. straw, at 1s. 6d.	1	2	6
Produce	5	9	8¼
Deduct outlay	2	0	0
Amount of profit ..	£3	9	8¼

1852.

	£	s.	d.
Paid for double digging	1	8	8
Dropping the seed	0	1	6
Six and a half pints of seed	0	0	6
Bird-keeping	0	5	0
Thrashing and winnowing	0	12	0
Total outlay	£2	7	8

	£	s.	d.
Fifteen bushels clean wheat, at 4s. 10d..	3	12	6
One bushel second ditto	0	4	0
Fourteen cwt. straw, at 1s. 6d. ..	1	1	0
Produce	4	17	6
Deduct outlay	2	7	8
Amount of profit ..	£2	9	10

1853.

	£	s.	d.
Paid for double digging	1	13	0
Dropping the seed	0	1	6
Six and a-quarter pints of seed ..	0	0	6
Bird-keeping	0	5	0
Thrashing and winnowing	0	12	0
Total outlay	£2	12	0

	£	s.	d.
Fifteen bushels clean wheat, at 8s. ..	6	0	0
One bushel second ditto	0	7	0
Thirteen cwt. straw, at 1s. 6d.. ..	0	19	6
Produce	7	6	6
Deduct outlay	2	12	0
Amount of profit ..	£4	14	6

This statement will be very incomplete without a few observations.

It will be seen that in the three years there has been a diminution of produce from twenty bushels to sixteen. Now, had this diminution been confined to my yield, and to others who follow the same system, one might have seen some force in the objection that the growth of wheat year after year on the same half-acre was exhausting the land; but every farmer knows, and has found to his cost, that while the first year (1851) was a singularly good year for wheat, 1852 was a singularly bad one, and the present year still worse. I will not presume to discuss here the deeper points of this question as to exhaustion of the land; for it is treated at length in the "Word in Season" (pp. 18, 19, 20, eleventh edition). With regard to this, there is no difficulty in getting the facts there stated proved in the case of any given soil; and if it turn out that they are correct, it is quite plain that on the majority of clays and loams—that is, on what are considered wheat soils—there is sufficient inorganic food for the wheat plant to render them practically inexhaustible, and that therefore the Lois Weedon system of tillage, by deepening the staple, so far from exhausting the land, leaves it in better condition than it ever was before.

It will be seen also, from the foregoing account, that the system has proved in my case very profitable, giving a net average profit of £3 11s. 4d. per half-acre; or supposing it to be a whole acre—superficial measure—of £7 2s. 8d.

My intention was to follow, with the greatest accuracy throughout, the directions laid down for my guidance, for I felt if I did not do so, the system would no longer be Mr. Smith's but my own as far as I swerved from it, and that Mr. Smith would no longer be responsible for whatever result might follow, but only myself. I kept close therefore to rule, except in one instance, where I swerved unintentionally. For I thought it was intended that the intervals should be trenched at once on entering on the plan, two full spits deep; and up to this time I have acted upon that idea. But, upon closer examination into the principles and directions and practice of Mr. Smith, I found I was wrong; and I mention this, because I hear that many others have made the same mistake. I now find that for the three or four first years two shallow spits are enough. For example, if the subsoil is clay, only a few inches are to be brought to the top—the guide as to quantity and depth being only just so much of the subsoil as can be pulverized and mellowed by the winter and summer fallow; and not so much of any subsoil as would be left in a raw state at the next sowing. My land, like that of Mr. Smith's four-acre piece, is old-going, exhausted land, and its character is a gravelly loam; and I trenched it nearly twenty inches deep at once, which was wrong in two ways. For I believe it was disadvantageous to the crop; and it was certainly detrimental to the pocket, for it added 15s. to the expense of the digging. So that if I had strictly followed the directions in this respect, my net annual profits from my half acre would have been £4 6s. 4d. instead of only £3 11s. 4d.

There are many other ways by which the conditions considered by Mr. Smith as indispensable to success, may be evaded or neglected. Such, for example, as the strict injunctions for early-sowing, a solid bed for the wheat, judicious stirrings of

the surface, well-pulverized and well-cleaned intervals—the outer-rows well earthed up. Reports have been published of want of success—nay, of utter failures, on this plan. The object of all discussions and all statements of this nature being to elicit the truth, it does seem to me—if I may be allowed humbly to express my opinion—that the very first thing, before coming to any judgment on the matter, should be to ascertain in every such reported case, whether the conditions were strictly carried out, or, owing to any circumstances whatever, evaded, or neglected.

Your obedient humble servant,

Lois Weedon, Oct. 19th, 1853. H. JONES.

BAKEWELL FARMERS' CLUB.

This important and flourishing association held their meeting on Monday, Oct. 24: the following were the prizes awarded—

CATTLE.

Best short-horned bull, of two years old and upwards, £2 10s., Messrs. Furniss, Birchill Farm. Second best, £1 5s., Mr. Benjamin Swaffield, Pilsbury Grange.

Best yearling short-horned bull, £2 10s., Messrs. Furniss, Birchill Farm. Second best, £1 5s., Mr. T. Gregory, Meadow Place.

Best short-horned cow incalf, or having had a calf since March 1, 1853, £2 10s., Mr. B. Swaffield, Pilsbury Grange. Second best, £1, Mr. William Smith, Bakewell.

Best short-horned heifer, in milk or incalf, £2, Mr. B. Swaffield, Pilsbury Grange. Second best, £1 5s., Mr. William Jepson, Edensor

Best yearling short-horned heifer, £1 10s., and second best £1, Messrs. Furniss, Birchill Farm.

Best bull calf, of the short-horned breed, six months and under twelve old, £1, Mr. P. Furniss, Pilsley.

Best fat cow or heifer, £1, Mr. W. Jepson, Edensor.

SHEEP.

Best long-woolled ram, of any age, above a shearling, £2 10s., Mr. Robert Purseglove, Ashford. Second best, £1 5s, Messrs. Furniss, Birchill Farm.

Best shearling long-woolled ram, £2 10s., Messrs. Furniss, Birchill Farm. Second best, £1 5s., Mr. Thos. Gregory, Meadow Place.

Best pen of five long-woolled ewes, which have bred and suckled lambs in the spring of 1853, £2, Messrs. Furniss, Birchill Farm. Second best, £1, Mr. Robert Sybray, Suitterton Hall.

Best pen of five long-woolled theaves, £2, Messrs. Furniss, Birchill Farm. Second best, £1, Mr. Peter Furniss, Pilsley.

PIGS.

Best boar of any age, £1 10s., Mr. Samuel Potter, Smerrill.

Best breeding sow of any age, most adapted for general use, £1 10s., Messrs. Furniss, Birchill Farm.

HORSES.

Best brood mare of the draught kind, with her foal at her foot, £2, Mr. Thomas Gregory, Meadow Place.

Best two-year-old gelding or filly of the draught kind, £1 10s., Mr. Thomas Gregory, Meadow Place.

Best yearling gelding or filly of the draught kind, £1 10s., Mr. Thomas Gregory, Meadow Place.

GIVEN BY MR. THOMAS BURGOINE.

Best stallion of the draught kind, two years old and upwards, £3 3s., Mr. William Wright, Wheston.

Best draught horse of either sex, £2 2s., Mr. G. Beardmore, Perry Foot.

CHEESE.

GIVEN BY THE HON. G. H. CAVENDISH, M.P.

To the manager of the dairy (he she mistress or maid) who shall exhibit the best six cheeses, not to be tested by boring or otherwise previous to the exhibition, £3 3s., Mr. William Tagg, Dirtlow. Second best, £2 2s., Mr. Joseph Owen, Peaks Hill.

R. W. M. NESFIELD, Esq., the President, in allusion to the present evils of the law of settlement, and the duties of the farmers to their servants, said:—"He would first call their attention to the law of settlement, which bore directly upon the farming labourers and upon their work, and upon their wages. They must not expect men who had to travel three, four, and five miles to their work and back, to be able to discharge their duties properly (Hear, hear). He would like to ask them how they could expect a man to walk ten miles and do his two shillings' worth of work besides? (Hear, hear). This was a serious and important question affecting both the employer and the employed. He claimed for the working man every advantage which circumstances could give him, and he would particularly call the attention of his hearers to the necessity of providing proper cottages for their labourers. At present labourers were too frequently herded together more like swine than human beings; and in endeavouring to better their condition there was this difficult problem to solve—whether they could bring to the cottage air, light, water, and comfort, and still make it pay. How was a landlord of moderate income to build properly constructed cottages so as to give him a return for the money expended? Had their friend Sir Joseph Paxton been present, he would have asked him, when his beautiful palaces were finished, to turn his attention to this point (cheers). As to the condition of labourers resident in farm-houses, he was more inclined to blame the tenant than the landlord: he had had many applications from tenants to build pig-sties and sheds, but he never heard a tenant apply for the erection of separate bedrooms for his servants so as to put the sexes more apart from each other. The consequence of the existing state of things was too frequently seen on Petty Sessions days; and this, in his opinion, arose from the master and his wife not doing their duty. It was the duty of the farmer and his wife to pay the same attention to the morals of servants—to watch over them with the same anxious and assiduous care, as if they were their own children—to make them better men and better women, and then they would be better farm servants; but so long as they were regarded as mere implements of flesh and blood, so long they would have to complain of the difficulty of getting their work done (Hear, hear). They boasted of these days of advancement and progress, and so much so indeed that the terms had become household words; but as regards agricultural servants they had retrograded most lamentably. Every one who had read of the feudal times of Haddon and Hardwick Halls must be aware that the proprietors of those fine old mansions took, in ancient days, every care to instruct their domestics in virtue and morality; but that system had died out, at any rate as regarded farm servants, and he asked what they had substituted in its place? He feared only neglect (Hear, hear.)" He afterwards said, in reference to a most important matter to the farmer—the collection of agricultural statistics—"Much good might be effected if committees were appointed to report from time to time whether a particular district was progressing or retrograding, furnishing also statistics upon the agriculture of the neighbourhood, of which they were at the present time lamentably deficient. It was to be regretted that no machinery was in existence by which the quantity and quality of the food produced in the kingdom could be ascertained, but he trusted

that this desideratum would be shortly supplied (Hear). He should be glad to see a sub-committee formed for this purpose (Hear, hear)." He thus concluded:—"He would now congratulate them upon the great change which had taken place in agricultural matters since last year; then they were dispersed; now everything connected with farming was at a remunerative price, in some cases being higher than they might expect or wish for. In times of adversity he indulged himself with grumbling as much as possible; it was a kind of safety-valve; it was the farmer's privilege to grumble, now because it rained, then against the sunshine because it was too hot; Englishmen *must* have something to relieve them, and therefore they growled (Hear, hear, and laughter). When prices were bad some few years ago, he (the President) joined in the complaining chorus; but he never gave in, and advised his friends to fight it out like men. It was well known that a state of prosperity was more difficult to cope with than one of adversity; therefore he said unto them "Bear your prosperity well, remembering that a day of re-action will come. Re-actions take place in all trades and in all occupations; my advice therefore is, make hay while the sun shines; then, when the day of adversity does succeed, that man who has put his house in order will best weather the storm."

The Hon. G. H. CAVENDISH concurred in most of the remarks contained in their chairman's excellent speech, and more particularly in those portions which referred to the changed state of agricultural affairs from depression to unalloyed prosperity. They had now wool, corn, and cattle, at a high price, not by any artificial means, but because God's blessings had been showered upon the country. Wool for manufacturing purposes was in increased demand, and meat was readily disposed of, for trade was good (Applause). He also agreed with their chairman that a continuance of this state of things was hardly to be hoped for. Every occupation had its ups and downs, and farming produce might next recede from high to low prices. Corn might be lower, and the high price of meat must to some extent limit consumption; still he must congratulate them upon the favourable circumstances under which they had met (Hear, hear). The remarks made in an excellent speech by a clergyman at the Bolsover meeting (the Rev. C. W. Whiter) were very applicable to the present time: referring to the remuneration of the labouring population, that clergyman said they must not only make it a question of wages, but they must look to their men afterwards—they must not only watch them in the fields, but they must attend to their comfort at home and give their children a good education. In these days when so many labourers were going to distant lands, they must try to attach them to their homes, and do something besides paying wages to keep them there (Applause).

THE FARNINGHAM AND DARTFORD AGRICULTURAL ASSOCIATION.

A certain identity of interest between the employer and the employed is a home-truth pretty generally admitted. The well-doing of the one must in some measure affect the other; and hence arises a sympathy that it cannot but be beneficial to encourage and develop. Whatever may be said to the contrary—and certainly that has been little enough, so far—the public recognition of duties honestly pursued and earnestly performed must be as politic as it is just. We compliment the scholar as we award him that distinction he has achieved amongst his fellows; the soldier carries on his breast the testimony of his good services; while the townsman gradually reaches those civic dignities, an upright course of conduct should insure him. From the lad who carries off his prize at school, to the statesman who stands at last in all that power of place his abilities have earned for him, the reward of merit cannot but impress a good principle. It affords us both the incentive and the example; and in honouring the one, we lead the many to study how they, too, may come to rank as worthily.

In no pursuit, perhaps, are master and man more closely associated than in the business of a rural life. They stand, it may be almost said, at the mercy of each other, and profit or suffer in something like a direct proportion to the manner in which they perform their respective duties. It is not, either, master and man alone that are interested here. The whole neighbourhood will cheerfully admit the exercise of that influence, which, commencing may-be with the lower power, impresses on him the value of able industry and good conduct.

The farmers of East Kent, the employers in this instance, would seem to be fully alive to the importance of demonstrations of this character. The labourers, again, appear as well able to appreciate what is thus done for them. Master and man, so far, are in the right way of each one doing his duty to the best of his means. If there be any exception, it is in a yet higher power than either of these. The Society which now heads this paper as the Farningham and Dartford, held its opening day on Wednesday, Nov. 2. It succeeds another that within these six weeks had existence, we believe, as the "East Kent." That association enjoyed the patronage of Lord Sidney, Sir Percival Dyke, and other landowners in the district. "The Farningham and Dartford," on the other hand, has no such high names to recommend it. As we were told from the chair, at the dinner, it is simply a "self-constituted body of agriculturists," doing the best they can for themselves. The East Kent Association had the patronage of gentlemen, who gave—as we were assured by the same authority—"neither their attendance nor support." They could not be brought to really feel the advantage of such meetings. Their influ-

ence, if it had any effect at all, was more to enervate than incite; and the practical men long saw, however closely the two classes might be associated on a hand-bill or a circular, they were never working together. Under these circumstances, the farmers of the district came to a bold resolve, but no less a wise one. They threw off their allegiance to King Log. They broke up the East Kent Society, and, while my lords and gentlemen stood passively by, they formed another with a similar object, but with far better working machinery—the Dartford and Farningham Association, "a self-constituted body of agriculturists."

This is now something more than a month old, while "the problem of its success," as was declared with some pride, "is already solved." About one hundred and fifty members had joined the society by Wednesday, Nov. 2; between fifty and sixty teams were at work in the field, and something over a hundred persons sat down to the dinner, at which we first heard the decline of one empire, and the rise of the other. We think we may venture to say there is not a good farmer or a good labourer in the whole district but has an active interest in the prosperity of this association.

What we have recorded is more in accordance with the sentiments of the meeting than any particular opinion of our own. It has never been our purpose to place landlord and tenant in opposition to each other; at the same time our first care has been the becoming independence of the English farmer. Too often, we fear, has he had but the nominal support of those who professed to work with him; and too often has he thus been stayed from doing what he otherwise might have done for himself. The farmers of East Kent are generally men of character, means, and energy; and we are inclined to give proportionate attention to the move they have made on their own behalf. It is in many ways a significant one. May it carry its own moral with it. "The promotion and encouragement of the labourer" should be as much a landlord's care as his tenant's, and we shall be the first to hail the two joining once more—perhaps a *little* more heartily—in so good a cause.

AGRICULTURAL STATISTICS.

"Is there anything I can do to oblige you?" asked an officious gentleman of his long-suffering friend. "There certainly is," replied the other, "one thing by which you may oblige me very much, and that is, to leave me alone." The English agriculturist, we fear, has been gradually brought to this *noli me tangere* state of mind. His officious, or his official friends, have been worrying him so long with what they mean to do for him, or what they should be ready to do for him, if he will only name it, that his patience has at last given way. His confidence, too, appears to have gone with it; and recollecting all the faith he has put in others, and what has come of it, he makes up his mind to have "no trust" for the future. He begins to see that, if there is anything to be done, the sooner he sets about considering how he can do it for himself, the better for him. If, then, he is still persecuted with patrons from high places insisting on obliging him in some way or other, he is more likely than not to meet them with the authority we have already quoted, and assure them that the greatest favour they can confer on him is to leave him alone.

It has already too come to this. An application to him on the part of the Government has been met very much in the spirit we have referred to. It is yet questionable, however, whether we can class the whole body, or majority of agriculturists, with that small portion only with whom the answer so far rests. We must cordially say, that for our own part we hope not. Were we to attempt to literally define what is meant by "Agricultural Statistics," we believe we should find them something which, for almost every reason, it is desirable to possess. We feel tolerably confident that, in the end, such information as would by this means be distributed, would act almost equally to the advantage of the producer and consumer. It would give to all the best chance of a fair market, and enable the man of small means to meet the heavy speculator on something a little more like equal terms.

Of course much would depend on the manner in which these statistics may be collected. "They want me to tell them how I make up my income," says one gentleman of long and high standing as a practical farmer. "The character of the scheme is altogether too inquisitorial," decide a whole body of others, after mature deliberation over the invitation before them. "It may do good for somebody else, but I don't see that it can do me any," adds a third: "and so let somebody else go to work about it: I don't mean to trouble myself."

These are the opinions, there is no denying it, of some practical authorities. The deliberate determination arrived at, in the meeting we quote from, is already well known from its general publication; for the others we ourselves can venture to answer. Let us meet them with another authority they will

be at once prepared to respect, and with an argument to which they will, we hope, be inclined to give something of that attention it really merits. The name of Lord Ashburton stands deservedly high amongst the agriculturists of this country. He was, be it remembered, one of the most energetic, and at the same time one of the most able Presidents the Royal Agricultural Society have ever yet selected. His Lordship's endeavour, while in that office, was to demonstrate to the British farmer his true position, and to advise how he might becomingly maintain it. He has the same laudable ambition still. The letter he has just written on this question of statistics would have *told* from any quarter. Coming from one we know so well, let us consider it in that light in which it really should be regarded—the advice of a friend whose best sympathies are with us.

Here, to begin with, is another interpretation of that terrible inquisition our Hampshire friends appear to dread so much :—

"With regard to the first point, the Government does not seek to know the amount of each man's stock or the extent of each man's cultivation. Such a return would be too cumbrous for use, too expensive for publication. The Government wants the sum-totals, not the items of which those sum-totals are composed. It seeks no more to mark and distinguish the return of each occupier than we seek to mark and distinguish each brick of which our house is composed. The house must be put together brick by brick, and the return for the three kingdoms must be gathered item by item; but the items which compose the sum-total will be as much lost in the mass and aggregate of the whole as the bricks which compose the house are lost in the mass and magnitude of the building."

Then, as to the object the Government has in all this—

"It has now for many consecutive years spent large sums in order to collect, digest, and publish the statistics of trade, shipping, and manufactures for the good of the merchants, shipowners, and manufacturers. Why should not some little money have been spared to do as much for us? Is it consistent with common sense that every month the public should have paraded before their eyes, and canvassed in the newspapers, the tons of shipping and the pounds of cotton which have entered or quitted our ports, and that no intimation should be given from year's end to year's end of the food prepared and preparing for a people's subsistence? Is our industry so unimportant, our capital so minute, that no note should be taken of its condition?"

Facts however, after all, tell more than argument, or mere anticipation of what may be results. Let us impress this once more, it is *apropos* enough just now. What has good information done for some of our friends on Mark Lane within this month or two?

"The great corn-dealers have long felt the necessity of collecting some such information for their own guidance. Mr. Saunders, of Liverpool, told the House of Commons Committee, in 1833, that he employed agents to travel over the corn districts, and report to him both the cultivation and the yield. Now, what is the consequence of this partial knowledge? Mr. Saunders can operate on the market for many days before we, the bulk of the sellers, become aware of the true circumstances which regulate the price of what we have to sell."

We find that we are re-producing nearly the whole of this admirable address. It cannot, however, be too much studied; nor must we leave it without one more extract, so entirely in accordance with our own opinions. There is no man who has less reason to fear "showing up" than the working farmer of this kingdom. The more he is understood the more will his efforts come to be appreciated, as the less liable will he be to that absurd abuse which has so long and so maliciously pursued him. Mark the ex-President of the Royal Agricultural Society on this point; and then let not the farmer be afraid of doing justice to himself :

"These statistics would obtain for us justice in this respect. They would show that the contribution of the foreigner to the subsistence of this country is as nothing when compared to that furnished by us. They would prove, that, instead of being a backward, unenterprising race, bigoted to ancient practices and incapable of improvement, we were bringing every year more and more acres into cultivation, and that we were every year investing more capital, however small might be the profit we derived from it. They would place the small farmer more upon an equality with the great dealer upon the Corn Exchange. They would further give to the trade such accurate information as would diminish the danger of those fatal speculations which ransack the world for corn under mistaken apprehensions of scarcity, and bring ruin on all engaged."

One thing is certain. Sooner or later the establishment of these statistics must come; for the attempt, however, so far, little can be said. The Government has set about the business with a weakness, and want of energy that might almost lead one to suppose they intended the experiment to be a failure. It is a serious question, after all, whether they have any right to so coolly saddle a board of guardians with the initiative; or, indeed, if they are at all warranted in depending on machinery of so uncertain and altogether independent a character. We cannot but consider it their duty to take up the subject far more seriously and earnestly than they yet have done. Sooner or later, we repeat, they will have to do it: as, in the words of that good counsel we have just availed ourselves of—"the wonder is not that the Government should now endeavour to collect agricultural statistics, but that it should never have sought to do so before."

The following letter has been addressed by Lord Ashburton to the Statistical Committee of the Alresford Union :—

"The Grange, Oct. 25.

"My dear Sir,—Having been unfortunately prevented from attending the board of guardians on Friday last, when the subject of agricultural statistics was brought under discussion, I may perhaps be allowed to endeavour to remedy that omission by addressing a few words to you and to the other gentlemen as-

pointed as a select committee to report upon the question. I am the more strongly induced to do so on account of the misapprehensions which seem to have prevailed, both as to the exact nature of the return desired of us, and as to the motives of the Government in desiring it.

"Now, with regard to the first point, the Government does not seek to know the amount of each man's stock or the extent of each man's cultivation. Such a return would be too cumbrous for use, too expensive for publication. The Government wants the sum totals, not the items of which those sum totals are composed. It seeks no more to mark and distinguish the return of each occupier than we seek to mark and distinguish each brick of which our house is composd. The house must be put together brick by brick, and the return for the three kingdoms must be gathered item by item; but the items which compose the sum-total will be as much lost in the mass and aggregate of the whole as the bricks which compose the house are lost in the mass and magnitude of the building.

"The next question is, Why does the Government desire these statistics—what is its motive? It certainly is not with the view of turning corndealer itself, as some have supposed, for that would be not only absurd, but illegal. It assuredly has no notion of taxing our produce, for no Government, under a representative system, would dare to propose a tax upon the first necessaries of life. It evidently does not wish to pry into our secret concerns, for it provides that we may make our returns at our option, either jointly or severally.

"It appears to me that the wonder is, not that the Government should now endeavour to collect agricultural statistics, but that it should never have sought to do so before. It has now for many consecutive years spent large sums in order to collect, digest, and publish the statistics of trade, shipping, and manufactures for the good of the merchants, shipowners, and manufacturers. Why should not some little money have been spared to do as much for us? Is it consistent with common sense that every month the public should have paraded before their eyes, and canvassed in the newspapers, the tons of shipping and the pounds of cotton which have entered or quitted our ports, and that no intimation should be given from year's end to year's end of the food prepared and preparing for a people's subsistence? Is our industry so unimportant, our capital so minute, that no note should be taken of its condition?

"This is not the case in other countries. The United States of America make an annual return of the number of bushels of corn drawn, the quantity they require for their own consumption, and the quantity they can spare for export. The great corndealers have long felt the necessity of collecting some such information for their own guidance. Mr. Saunders, of Liverpool, told the House of Commons committee in 1833 that he employed agents to travel over the corn districts and report to him both the cultivation and the yield.

"Now, what is the consequence of this partial knowledge? Mr. Saunders can operate on the market for many days before we, the bulk of the sellers, become aware of the true circumstances which regulate the price of what we have to sell.

"Some 10 years ago the same advantage was enjoyed by the great money jobbers on the London Stock Exchange. They kept their couriers travelling from city to city, and obtained information five or six days in advance of the ordinary post. They made rapid fortunes at the expense of the public; but now the electric telegraph has placed all upon a level. The publication of these statistics will produce the same good on the Corn Exchange.

"There is a further consideration which should operate on our judgments, and I therefore mention it, though it may trench upon politics. Not only does the farmer suffer for want of statistics in his contest for price with the great dealer on the Corn Exchange, but he suffers also from the same want in his contest for consideration and political power with other classes on the great stage of life. I have no doubt in my own mind but that the capital we employ and the produce we raise exceed in value all the capitals and all the produce besides raised in this great manufacturing country; but I have no figures to appeal to—I can speak only from conjecture. When, therefore, next year, or when at any future time, it is proposed to make a new apportionment of power according to the importance and magnitude of the several industries, our claims will be most assuredly underrated.

"These statistics would obtain for us justice in this respect. They would show that the contribution of the foreigner to the subsistence of this country is as nothing when compared to that furnished by us. They would prove that, instead of being a backward, unenterprising race, bigoted to ancient practices and incapable of improvement, we were bringing every year more and more acres into cultivation, and that we were every year investing more capital, however small might be the profit we derived from it. They would place the small farmer more upon an equality with the great dealer upon the Corn Exchange. They would further give to the trade such accurate information as would diminish the danger of those fatal speculations which ransack the world for corn under mistaken apprehensions of scarcity, and bring ruin on all engaged.

"Actuated by these impressions, I have long desired that we should be put on an equality with the other great industries of the country, and I have done my best at all times to induce the Government of the day to advance the money requisite for the experiment which is now before you.

"I remain, my dear Sir, yours faithfully,

"Mr. Edward Hunt. "ASHBURTON.

"I should add that our Scotch neighbours, who are shrewd enough to detect what is and what is not for their advantage, have made their return without hesitation. A still more searching return has been made for two years from Ireland, without complaint on the part of a tenantry who are as quick in perceiving as they are skilful in producing a grievance."

AGRICULTURAL STATISTICS OF OUR COLONIES.

Agricultural statistics and other commercial topics of a kindred character appear to occupy a large share of public attention at present, for obvious reasons—the short-comings of the past harvest, and the consequent advance in the daily necessaries of life which such have given rise to. But to a country like England, depending upon an annual importation of something like twenty-five per cent. of her produce, something more than the mere agricultural statistics of her own provinces is necessary to be known; for it is also necessary to know something of the agricultural statistics of the provinces from which she is likely to receive her imports. If we this year, for instance, require say from 6,000,000 to 7,000,000 qrs. of foreign wheat, it would be of great value to know which of the various kingdoms of the world could best spare us this supply. There is, no doubt, some considerable diversity of opinion as to our actual short-comings this year as yet, both in the breadth of land under wheat and yield per acre; but differences here are comparatively little to what they are upon the other side of the question relative to our foreign supply, for, according to one party, we have almost got all from the Baltic that can well be spared of breadstuffs, unless at famine prices. The Black Sea, if we can believe a second, will soon be hermetically sealed by the war between Turkey and Russia. (?) France, Italy, and Austria will require all that can be spared from the Mediterranean. Some "800,000 qrs." may be had

from the United States of America; but what will this do to balance the wants of the mother country, estimated by such parties at "12,000,000 qrs.," and even "18,000,000 qrs."? In short, if we could believe them, *England is on the eve of being starved!*

Another class will have it that America can supply all our wants; for since 1847, say they, 12,000,000 acres have been taken possession of, while a larger breadth has been reclaimed, besides an extra area of land under crop, and yield per acre, with increased facilities for sending the surplus to the English market; that the immense accumulations of corn at Odessa, Galatz, and other ports of the Black Sea will be available for England and France, and that the present speculation in corn is altogether unwarranted by circumstances. In short, opinions are as much divided as can well be imagined—tenfold more so than what they are as to the deficiency of crop 1853 at home; so that, from the effect which this has upon its value, foreign statistics are as much wanted as home, for foreign crops are now being bought up, and held on hand in exporting markets, in order to force up the price in importing ones, such as Mark-lane; hence the consequences experienced by every branch of industry, from provisions getting up to an exorbitant rate.

It is not England alone which has become sensible of the importance of agricultural statistics, for the subject is engrossing the attention of every kingdom in the world, almost; and nowhere is it exciting a more lively interest than in the United States of America and our own colonies. Our transatlantic cousins have been organizing a system for the last ten years, and are a long way a-head of us in this respect, even although facts are much more difficult to collect, owing to the immensity of her territory and scattered population, than in England, where things are in the opposite extreme.

The agricultural statistics of her colonies are of more importance to England than those of all the world besides, because she cannot now grow sufficient corn for herself; and because they are her best customers, for the more corn she takes from them, the more goods they take from her. This mutual reciprocity of transactions is of the highest value, and deserves to be cultivated with greater care than it has been—not according to the patriarchal rules of the olden time, but by the reduction of modern science to practice on the self-supporting principle. Our colonies must act as men, not children, and by sequence be treated as such, before they can be expected to develope their productive resources; and this is just the course of things now being established. Our colonies are striving to develope their productive resources, so as to reciprocate with the demands of the mother country.

What is true of the statistics of our colonies to the mother country is equally true of the statistics of the mother country to her colonies, they being of the greatest importance to them; for with a proper and timely knowledge of the state of our crops, they could often increase or decrease their supplies and demands accordingly, so as to maintain an equilibrium on an average of years, making good harvests cover bad. If, for instance, they knew by April that England was 1,000,000 acres short of her usual breadth of winter wheat, and that appearances at this period were unfavourable to spring sowing and harvest, they could always easily provide for this deficiency by spring-sowing and from stocks of old wheat on hand. If, on the other hand, England had her full breadth of wheat land, and if they knew by Midsummer that this was likely to turn out an extra crop of say some 2,000,000 qrs., they could convert as much of their breadstuffs into dairy produce and other provisions for the English markets, so as to procure from thence their usual supply of manufactured goods.

Much has yet to be done before the work of agricultural statistics is in full operation either in the mother country or her colonies. Indeed, as yet we are only upon the threshold of the subject; so that the utmost that can be said on colonial statistics are a few general deductions, showing their importance to us.

To place an Englishman in the back-settlements of America, and to suppose that he would there toil under the broiling sun of summer and piercing winds of winter, not only to grow bread-corn for himself and family, but also for his relatives in England, and not only thus toil in growing it, but also to set out some eight or nine hundred miles of trackless forest-route, to place his wheat on board some English bark, is just to suppose what at first sight appears absurd enough; for in a land overflowing with all the natural productions of the mother country, what inducement has he to toil thus, summer and winter, early and late, or attempt impossible journeys, with a load of wheat, to save England from starving. No wonder, therefore, that some have hastily concluded that the United States of America would not and could not send us more wheat this year than last; but when we take a more practical view of the social fabric of the world, it is no such absurdity, for the colonist cannot do better. Something more than bread-corn is necessary to constitute the domestic happiness of a colony; and those other things he can get cheaper from England than he himself can make them. The transaction is one of mutual reciprocity.

An emigrant, on his arrival in a colony, is not satisfied with barely the daily necessaries of life, like the labourers of the mother country; for he must have land—a farm of his own. This is the main-spring of all his labours. The first ten or twenty years of his life are spent in toiling hard early and late, to purchase land, reclaim, and stock it. The poor man may commence with an empty pocket, and at the expiry of twenty years may be in possession of a farm worth £1,000, or even £2,000, including the stock. During this period he must have spent several times this sum, exclusive of what he himself consumed in bread-corn. If we suppose that he commenced with his wife only, they could easily earn as much in one month as would procure all the bread-corn which they themselves required in twelve, and so on yearly until the youngsters were able to do for themselves. The balance of eleven months' labour would go for the other necessaries of life, and the reclaiming and stocking of their farm.

Farther into details we need not enter; our readers will easily supply the balance, our space being limited.

Enough has been premised from which to deduce some very important statistical conclusions.

Our emigrants now number about 500,000 annually; of these, 200,000 may be set down as efficient hands, worth on an average 2s. 6d. per day. But say only 100,000 at this wage; consequently they would be worth per annum £3,900,000, or say £4,000,000. If we suppose they consume ten bushels of bread-corn each, then the total consumption would be 5,000,000 bushels; and if we further suppose wheat 6s. per bushel, the total value would be £1,500,000, leaving a balance of £2,500,000, which would be equivalent to upwards of 1,000,000 qrs. of wheat, or say *ten quarters* for each man. According, therefore, to our hypothesis, we have 100,000 families, consisting of five members each. Each family is worth or grows 130 bushels, but only consumes 50, leaving a balance of 80 bushels each to cover other demands and provide for the future.

But from the previous data it is assumed that the 100,000 families are twenty years before they are able to accumulate their little properties of the value of £1,000 each, or the general stock of £100,000,000. Probably forty years may be as near the time in many cases; but whatever the length of the period may be, with an emigration stream of 500,000 annually, it would give us an effective force of about 2,000,000 families, with five members in each, at this period, and so on for similar, striving with all the means in their power to accumulate agricultural property. Of these, 100,000 would annually conclude the task of reclaiming the whole of their lands to aration, merging in to what may be termed the normal state of society; while 500,000 newly arrived emigrants, or 100,000 families, would be added, keeping up the strength of the pioneering force to the above number, the result of whose labours would be equivalent to 20,000,000 qrs. of wheat, exclusive of their own consumption. The annual sales of wheat may be about 10,000,000 qrs., the other half of the equivalent being other kinds of produce.

Doubtless, were a perfect system of agricultural statistics in actual operation, very different results would be given from the above; for we have supposed the wages of settlers—man, woman, and child—only sixpence per day each, while we believe they are at least twice that sum. Again, instead of 2s. 6d. per day for twenty years to each five colonists and their offspring, it is only during the first year or two that this small sum is realized; for if we suppose the size of each farm to be 200 acres, then 10 acres would be reclaimed yearly, and the last crop would be worth from £200 to £500, instead of £39, so that the average income of the family for the twenty years would greatly exceed the sum we have stated, and the result in produce would be equally different. On the other hand, we have supposed the whole of the emigrants to embrace agriculture, while probably only two-thirds would do so; but the annual growth of society (30,000,000) would be 500,000 and upwards, so that one-third of this number would at least embrace agriculture, thus making up the former. According to these data, our colonial population, including the United States, is at the present date increasing at the rate of 1,000,000 annually, the one-half embracing agriculture and the other manufactures and commerce—a state of prosperity calculated to produce results in the world of no ordinary magnitude in a very few years.

In our colonies, however, we have agricultural statistics in part to guide us already. In the United States, for instance, 12,000,000 acres have been sold during the last five years. Now, if we deduct 2,000,000 acres for roads, ditches, woodland, &c., it will give 10,000,000 acres for reclaiming, or an annual sale of 2,000,000 acres for this purpose; and if we suppose that they are twenty years in being reclaimed, then we have 40,000,000 acres in the course of being brought under the plough. Of this, 2,000,000 acres would be annually finished, while a fresh purchase of 2,000,000 acres reclaimable lands would be added to the stock; consequently 2,000,000 acres are annually reclaimed, and 12,000,000 since 1847. Lastly, if we divide the 40,000,000 acres into farms of 200 acres each, we shall have 200,000 farms in the course of being reclaimed, and 10 acres on every farm yearly. Every farmer would break up 10 acres the first year, and a similar quantity every subsequent year of the twenty. The first year he has 10 acres under crop; the second, 20; third, 30; fourth, 40; and fifth, 50 acres. After land is cropped five, six, or seven years, just according to its quality, it is thrown down to grass, when at the expiry of a few years it is again broken up. On the last year of the twenty, or twentieth year, from 100 to 150 acres on each farm would be under crop; consequently 50 acres will be under than above an average upon each of the 200,000 farms, or a total of upwards of 10,000,000 acres under crop yearly, yielding from 10 to 40 bushels per acre, or, on an average, from 10 to 16 bushels, or say 12 bushels, giving a total of 15,000,000 qrs. yearly.

According to the above hypothesis of 200,000 farms being annually sold, we have as many farmers or families settling, the one-half of whom may be emigrants from Britain and other places of Europe, and the other half the growth of society in the Union, such as her farmer's sons. The hypothesis of a hundred thousand families of emigrants annually settling in the Union for the last five years is probably not very far from the facts of the case, while 200 acres are probably large enough for an average size of farms. But the sons of American farmers, and other native purchasers, are wealthier, and make larger purchases, bringing more machinery to bear upon the reclaiming of land. 50,000 farmers and 400-acre farms are probably, therefore, nearer the thing; but differences of this kind, although they may affect the statistical details of the Union, do not in the slightest degree affect the conclusions at which we have arrived—the more interesting part of the subject to us.

We must leave much that ought to have been said on this important subject, and briefly conclude for the present by drawing attention to the immense resources of our colonial empire, whose growing greatness and prosperity can scarcely be conceived by those not practically familiar with the facts of the case. Were a perfect system of statistics carried out, the progress of industry

would scarcely be credited by any in this country. An entire revolution has taken place within the last few years, partly from the influx of Californian gold, but principally from the progress of science. For long, the penniless emigrant had no alternative but squat himself, on his arrival, in the bush, and there, amid hardships which tongue can scarcely tell, complain that he could not dispose of the produce of his labour at any price, to procure a few of the many comforts demanded by civilized life. But steamboats and railways are fast expelling from the bush all its hardships, bringing markets to every farmer's door; for capital begins to flow freely, affording plenty of employment to emigrants on their arrival, enabling them to accumulate the necessary means to purchase land, and bring more effective implements and machinery to bear upon it, thus producing more work in a given time. The value of agricultural property annually being created is incalculable. We have seen that in the United States alone upwards of 2,000,000 acres are now annually being reclaimed, worth about £20,000,000 increase of value, and in a few years must greatly exceed this quantity, owing to the rapid growth of society and progress of science; for farms are now being reclaimed in half the time they used to be, greatly increasing the profits of the pioneering period above what we have stated. It is this pioneering in the forest, the bush, and the prairie, creating agricultural property, and laying the foundation of colonial manufactures and commerce, that renders our colonies so valuable to us as a source of supply of bread corn, and consumption of our manufactured goods. Old settlers are pushing their reclaimed lands to settle their families. Emigrants are toiling hard to acquire land. How interesting and important to the mother country would the statistics of all this be!

B*****.

WHEAT SOWING.—MR. PAWLET'S EXPERIMENTS.

The period of wheat-sowing, and the urgent demand there is for every one contributing his utmost to grow as much as possible of that invaluable farm product, reminds us that there is one means which the farmer has often at command to enable him to grow a large acreable proportion of any kind of crop, which is the selection of a suitable variety; that in turnips, in potatoes, and in wheat, a certain kind is often successfully grown possessing decided superiority over any other. Thus, if we have a light soil, almost too coarse and sandy to grow wheat successfully, we are certain of a produce of six to eight bushels per acre more of Spalding's Prolific than of almost any other variety. True, the sample may not be so firm and bright—or the yield of flour scarcely so much per bushel—but the gross returns, both of money as affecting the cultivator, and of flour as regards the acres cultivated, will be found highly satisfactory.

And all experiments of this kind are very valuable. Mr. T. E. Pawlet, of Beeston, near Bigglesswade, carries on a variety of very valuable experiments from time to time, and always, with a most praiseworthy candour, gives them to the public. In his annual letter—we call it so, for it occurs to our recollection that in several autumns we have had the benefit of his carefully-made experiments in wheat-growing—Mr. Pawlet says: "I believe, from repeated experiments I have made, that great attention should be given to selecting the most productive sorts, a knowledge of which can only be arrived at from repeated trials, as single experiments are of little value."

He says little of his soil, beyond its being in one part of a moory nature. We note this, because, in his first experiment, the Spalding's Prolific stands far from the highest in point of quantity, though its position as regards price is about its proper standard, and hence we infer that the soil was of a clayey and loamy description. The same inference would be drawn from the favourable returns of his experiments when he had grown white wheat. His first experiment was on good soil, which had previously been a clover lay depastured. The following kinds were sown at the rate of seven pecks per acre, and the result is given below in bushels:—

	Bush.	Pecks.	Gal.
Spalding red.....	32	2	1
Improved Browick red	34	0	0
Albert red	31	2	1
Banham's new red	34	2	1
Improved Browick red	34	2	0
Lammas red.....	32	0	1

Here the Browick red, sown in two different parts, shows what may be called a decided superiority over the others, because in both cases it stands amongst the highest in the list. These were all red wheats. His white wheats in the same field gave the following results:—

	Bush.	Pecks.	Gal.
Imperial white.....	31	0	1
Grace's white	31	3	0
Imperial white.....	31	1	0
Brown Shaw white..	27	0	1

The above were all sown when the soil was dry. It is usually recommended to sow wheat when the land is in a wet condition. It is said here some of the same varieties were sown the same day, but with the land wet, varied in produce; the inference, however, to be drawn being that the land was strong and impatient of wet. The following was

the result with several of the same kinds as those mentioned above :—

	Bush.	Pecks.	Gal.
Imperial white.....	26	3	0
Improved Browick red	27	2	0
Overman's red.....	26	3	0
Odessa red.....	26	0	0
Ugly Buck red.....	21	1	0

Here was a difference of the same kinds of wheat of from 5 to 7 bushels per acre in the circumstances of sowing. We have seen in turnips the most remarkable difference between sowing before and after a shower, amounting to one-third certainly in the produce.

But to "daub in" wheat, in other words to sow it when the soil is wet, has run into an admitted proverb. Possibly the very wet season of 1852 which followed, might exercise a far more unfavourable influence than if it had been similar to those of an ordinary character.

Another experiment, made in a wet state of the soil the same day, strongly confirms the preceding experimental facts. The kinds of produce were :—

	Bush.	Pecks.	Gal.
Improved Browick red	25	0	1
Scotch red	23	0	1
Spalding red	23	0	1

Here is still a superiority of the Browick, but yet a greater difference in the quantity, in the land sown wet and the land sown dry, the Browick being 9 bushels less per acre, and the Spalding the same quantity, showing the exact ratio of the experiment, and affording strong evidence of the difference not being accidental, which will sometimes happen in an experiment.

His experiments on the moorish soil we spoke of, also in a wet state, show the Browick at the head of the list, as the statement below will prove :—

	Bush.	Peck.	Gal.
Improved Browick red	28	2	1
Odessa Russia red..	21	3	1
Prima Donna red ..	22	1	1
American white	23	0	1

Now we see quite sufficient to show how, in some seasons at least, it is desirable to put in the wheat when the land is in a dry state. We should like to hear of any experiments made of sowing about the same time, in the same land, of wheat put in the ground in a wet, as contrasted with that sown in a dry condition. We thought we were hardly prepared for the fact in any land; it is just possible it may be only true as regards some kinds of soils, but it is best to sow wheat in a wet state.

It is quite evident from these experiments that one variety will grow much more corn than another.

INJURIOUS EFFECTS ARISING FROM UNDRAINED PLEASURE GROUNDS.

In the course of one of the ordinary missions which call us into various parts of the country, we lately witnessed some of the worst of many examples to which we could testify, arising from undrained ground. The piece of ground to which we shall now refer consisted of some six or eight acres of pleasure-ground, upon which were growing considerable numbers of common trees and shrubs, mostly standing singly upon the lawn. Some of the trees had attained a moderate size, and were in the best possible health, while others were the very reverse of this. Amongst the latter class was a common Cedar of Lebanon, of about 30 or 40 years old. At various periods this tree had grown freely enough : but, at others, it appeared to have suffered severely; this was indicated by the irregular efforts of growth; and this was especially the case with regard to the recent growths, owing probably to the excess of wet which has fallen during the last two years. The tree in question is at present in bad health, and most of the leaves have fallen off, and, although not dead, it presents the appearance of an ordinary Larch tree in winter garb, denuded of most of its foliage. Our attention was specially directed to this tree, and the inquiry was raised why it was so unhealthy. Upon examination it was very obvious that the roots of the tree were exposed to an excess of wet during winter. The result of this, as a necessary effect, was the decay of large numbers of the smaller roots. It was affirmed that wet could not be the cause of the evil; for in this pleasure-ground, we were assured that "*several drains had been made.*" Several drains, then, were thought sufficient to render these six acres of pleasure-ground dry and wholesome. On ascertaining with more exactness what was really meant by "several drains," we learned that the several drains consisted of one drain about 100 yards in length, and two others, some 20 or 30 yards long, each running into the longer one, and that two of these were "bush drains," and none of the three more than 18 inches in depth. These three drains, therefore, were confidently referred to as the most undoubted security to all kinds of trees and vegetation growing upon these six acres of bad ground, against the mischievous effects of over-moisture in winter. Unbelief and want of faith in all this good work led us to raise some doubts as to the efficiency of these bush-drains. Our insinuations, however, which ulti-

mately became argument, seemed to fall lifeless and without force on the mind and ear of the owner and those who were his advisers in this matter. Failing to convince by argument, we had recourse to other means; and within four yards of the stem of this Cedar tree we caused a two-feet square hole to be dug in the ground, about three feet in depth; and in a few hours this hole stood filled with water to within six inches of the surface of the ground. This alternative proved more forcible than argument; and it was at last conceded that, after all, the ground was rather wet, and might be improved by more effectual drainage. In thus minutely relating the preceding circumstances, our object extends beyond the desire for mere effect; for we regret to believe that the dark and cloudy notions which hang over the mind of the owner of this piece of garden-ground, as to what is really meant by draining in the proper sense, is but one of a multitude of similar cases lamentably common in every part of the country. A gigantic evil like this having been rooted and grounded in the early education of the adult population of our time, busied as they are with the everyday-duties of life, few have leisure to spare for the study of works of this nature. It is true that of late much progress has been made amongst all classes, both as to the advantages of draining and the mode of performing this very simple operation; yet with all this, very strange and very absurd views are plentifully entertained by large numbers of persons; and some of these, at least as we think, ought to be better informed. As a general rule, wherever ground is in need of draining at all, experience has very fully confirmed the fact that the drains, to be useful, ought to be from 3½ to 4 feet deep, and not more than 20 feet apart; and to be laid at the bottom with 1½-inch round pipe, as much more likely to continue in repair than stones, gravel, bushes, coke, cinders, and various other materials which the ingenuity and whim of unpractical amateurs so often recommend. Every one is aware that the present season has been, and still is, an unduly wet one; and it may therefore be said that the earth everywhere must be wet at the present moment. This is true; but the difference betwixt ground properly drained, and ground not drained at all, or, what is much the same thing, ill-drained, is this—that the former allows the rain that falls upon it to pass quickly away, and in a few hours it may be walked upon, and feel firm to the foot; and only in very exceptional cases, if a hole were dug such as we have described near the cedar-tree, would water stand in such hole for more than an hour or two, rain as it might. Let any one try to reflect upon the effects which must ensue in keeping the roots of ordinary plants, whether trees or herbs, standing immersed in water from October to March—for this is in fact what takes place in all wet ground. One of the effects which invariably result from such a state of things as this, is so common, and of course so familiar to the mind of every observant person, that we need only to refer to the fact, and the monstrous evil will at once be understood. Let any one, therefore, examine a piece of ground which is annually saturated with wet throughout the winter-months, and they will find that immediately on the return of dry and hot weather in summer this piece of ground will (at least this mostly happens) dry up, consolidate, and deep cracks will be formed throughout the surface. The herbage, if any, will be found to have no live roots except on the surface; and, as a natural consequence, shortly after the dry weather sets in, the vegetation becomes languid, the roots being torn into many fragments by the numerous cacks. All this applies also to the sickly cedar-tree, to which we referred in a previous part of this paper. Much, very much, remains yet to be done, both in agriculture and horticulture, before full advantage has been taken of the beneficial results which proper drainage is so fully calculated to supply.

AGRICULTURAL SOCIETIES.—THE POULTRY MOVEMENT.

There are few of our readers who do not remember the passion there was for political agricultural societies some twenty years ago—they were all but universal throughout the country. They kept true to their one object—watching over the interests of agriculture in its political aspect only. These gave way to farmers' clubs, which, excluding all political subjects from being discussed, took another course, and embraced papers, discussions, and meetings on practical and scientific farming only. These prevailed almost in every important market town, had their day, and many disappeared. Then sprang up the agricultural premium societies, all of a very meager character, with a very narrow range of competition, and amongst themselves made and dispersed premiums to encourage the breeding of stock. These, again, began to wane; and the tendency seemed to be to centralize and combine these scattered local elements into *foci*—consolidated into such societies as the Royal, Highland, Irish, York-

shire, Bath and West of England, North Lancashire, &c., and which have all of them more or less of the elements of success.

But a new direction seems to be taking. The Smithfield Club stands amongst the oldest of our exhibiting societies of fat stock. It has shown that in a populous and well-situated centre, a stock show could be successfully held, while we have its fellow springing up at Birmingham. This, however, obtains a vast amount of its *éclât* from the fact of a poultry exhibition being attached to it, which contained some 1200 entries last year—a vast army of feathered beauties, the rage of old and young, of rich and poor. Such is the impetus given to these local exhibitions of fat stock and poultry, that we can hardly trust ourselves to name the whole which are now before the public this year. A few of the most prominent may be mentioned, as the Smithfield Club, whose entries closed on the 5th of November, and that gives about £800 away in the week commencing the 5th of December. Then the Highland Society has launched a new show, to be held at Edinburgh on the 12th and 13th of December, the entries closing on the 2nd of that month, and the premiums amounting to £300. The Birmingham exhibition of fat stock and poultry is to be held at the same time, and the entries closed on the 12th of November. Again, the Yorkshire Agricultural Society, so well known for its very meritorious show of breeding stock in summer, has announced a fat stock and poultry show at Leeds, on the 6th and four following days, offering about £325, and whose entries close on the 15th of November. But we by no means stop here. From a list so long, we can hardly pick out what are likely to be large and important from what are really insignificant. One is fixed at Bristol for the first week in December, another at Southampton on the 24th of November. Another at Hitchin the 3rd week in December, and one at Yeovil on the 2nd of November. And again at Darlington, Doncaster, and several other places.

But the distinctive feature of nearly all these is that they contain shows of poultry. This is a new feature. The only agricultural societies of any standing which we remember to have embraced poultry, were the Dublin Society and the Highland Society, which gave prizes for them many years ago. The first English society, as far as our memory serves us, that offered any prizes, was the Yorkshire, which in 1840 offered £10, the gift of Edwin Eddison, Esq., of Leeds, who has lived to see the same society in that town offer £121 of its own accord for this object.

The poultry subject has become, therefore, agricultural; but we fear there are two or three circumstances connected with the movement which will give it an evanescence similar to that the institutions we have named before have had to experience. We wish a little common sense to be applied to the subject, and then it may become a real auxiliary to agriculture; but unless this is the case, it will be classed amongst such bubbles as the tulip mania, the South Sea speculation, or the Cæsarian cow cabbage. We wish to see the question stripped of a vast deal of its quackery and empiricism, and made a really valuable vehicle of conveying some profit into the pocket of the farmer.

And first we would urge the importance of reasonable prices being given and asked. We squabble not at a pound or two for a really superior bird, of a race of good fowls: but we do protest against the insanity of giving £100 for any fowl whatever—a practice which must soon, if it should occur in many instances, put an end to the whole attention now being bestowed upon poultry. We admire "pointy" birds—we should be glad to see all kinds of fowls showing large muscular development in the best parts. This, with the quality of laying a plentiful quantity of eggs, seems to us to be the real perfection of poultry. With them, the same as with all other live stock of a farmer, we want to see the prime parts fully developed. We care less for the coarse leg, than we do for the plump and wide breast, and think it as absurd either to select or cast off a bird for the colour or shape of a feather, as it would be for the judges of an agricultural society to decide against every pig, however good, which was not a black one.

So far as shape of combs, colour of feathers, shortness of tails, or any similar criterion is an indication of *purity* of breed, we would give just that weight it was worth; but beyond this, to go into all the fanciful theories of dealers or amateurs, over qualities which can never be rendered either permanent or unvarying, is we think calculated only to bring the whole science of breeding, the whole passion for improvement, the whole range of study within a code of absurdity too ridiculous to refute, too silly and impotent to continue.

Again, we are sorry to see a disregard of size. We hold that, other things being equal, a large bird of any kind is better than a small one. When fancy bantams are wanted for pets, let them be kept as small as possible—they will amuse and please; but when the object is the profit of the farmer, let them be those which with their other good qualities combine a good, full-grown, healthy size.

We believe, when the fancy rage has disappeared, when men begin to reflect and to try, the Black Spanish will be found to combine the greatest number of really good qualities of all kinds of

poultry, and like the universal favourites, they are the common-sense bird of the farm—have size, hardihood, a good breast and wing, and are good layers, sitters, and mothers. While we say this, we believe it will shock many poultry fanciers to hear that we have no doubt a *cross* between the Dorking and the Cochin will be the finest bird on the table. The cross, however, must always be repeated. It will not answer to breed in-and-in with crossed fowls. But birds, however beautiful, will soon spread: a single sitting of eggs will supply a parish in a twelvemonth; and hence the absurdity of extravagant prices for birds, however excellent.

WAGES.

No. XVIII.

I hope from what I have written upon the subject of the employment of women, especially of mothers in field and other out-door work, no one will suppose that I would advocate any direct interference with the employment of women in agriculture. Such interference at present must be deprecated—the mischiefs that would arise from any *sudden* endeavour to overthrow the practice would outweigh those it already entails upon our rural and manufacturing populations. The evils that attend it can only be relieved by *individual* attempts to better the condition of the labouring classes.

It will be seen, from what I have said here, and in other letters, that I am no advocate for the interference of Government in these social matters—indeed I am not. I delight not to see men sit idle, with the excuse that they are waiting till Government does this or that. Men seem as though they would consent to have all, down to the very cooking of their food, under the control and regulation of functionarism. They seem to look upon action as impossible, without the stimulus of Royal Letters Patent, and the threat of penalty; whereas, in the good old times, popular measures emanated *from the people*, and were ratified merely by the Executive. Let us rather conserve our individual respect, our municipal vigour, and not give way to those certain tendencies to a withering and blasting centralization now growing up amongst us, and binding us in our sleep with such cords as circle the limbs of continental liberty. Do we not all remember how in 1782 the rate of wages was attempted to be fixed by law? "In 1795," as I learn, "owing to a rise in the price of corn from 5*l*s. to 7*l*s., the magistrates of several of the southern counties issued tables showing the wages which, in their opinion, every labouring man should receive, proportioned to the number of his family, and the price of bread; and the parish officers were instructed to make up the difference between this rate and that paid by his employer!" How truly contemptible! This system, or at least one akin to it, continued to be acted upon with us, as it is well known, down to the passing of the Poor-law Amendment Act, and destroyed, as might have been expected, every feeling of independence on the part of the labourer.

But to return to my subject. I have spoken of women and girls in the present relation; now let us consider boys in the manner in which they are affected by the bare subsistence-money earned by the parent or parents.

That the boy is left to himself, or to vicious companionship in this position, is a sufficient evil—that at a very early age he is taken to work, and exposed to undue toil and the rigours of weather, is a further evil; but that he shall be induced, as I find to be the case in the southern districts, to contract a habit that shall counteract any benefit from increased earnings, and tend to beggar his whole existence, is beyond all endurance. Who, think you, can be patient, in view of this vile cider truck system? It is bad enough in all conscience to impress grown men and women into this practice; but in the case of boys of seven, eight, and nine years of age, accustomed to drink a pint or a pint-and-a-half of rough cider a-day, the mischief effected is beyond the ordinary evils of this species of truck. A gentleman well acquainted with the facts of this case writes thus:—"The boy is taught to love drink from his earliest age; and a few years so confirms him in the taste, that he rarely, if ever, gets rid of it in after-life. The greatest and commonest vice of the agricultural labourers is drinking, to which may be ascribed much of the extreme poverty and wretchedness that is met with amongst them. Were it not for the money spent in drink, I believe that the majority of them could command more commodious dwellings, and more animal food for themselves and families, than they have at present. Drunkenness practically renders higher wages of no avail; for the surplus of wages, above what is absolutely required for the lowest state of subsistence of the family, is spent at the beer-shop. The ordinary pretence in support of this petty truck in cider is, that the labourer cannot work without drinking several pints a-day."

Let us see whether a respectable farmer in Somersetshire agrees with this statement. He says:—

"A practice affecting the condition of the labourers, and which cannot be too much condemned,

is the paying part of the wages of the men, women, and even boys, in cider. It is generally said by farmers that the work cannot be done without cider, but I can produce practical proof to the contrary. I myself have totally abstained from cider, beer, and all other spirituous drink for the last six years [a noble example, my friends, to begin with; and example anytime is superior to precept], and during that time have worked as hard in farm-labour as any of the men I have employed. I have some labourers who have also abstained from such drinks for some time. They work quite as well as the men who drink, and in all respects are quite as well in health. They and their families are much better off also, in consequence of such abstinence. I give them the regular wages in money paid by other farmers; but, instead of the cider, I give them a potato ground of about half-an-acre, from which are got 120 bags of potatoes; I dress the land for them, and haul the potatoes when dug up; the labourers find and plant the seed, and keep the ground clean, and dig the potatoes. It is nearly all done, however, by their wives and children. Thus, instead of consuming a part of their wages in drink, as is generally the case, my labourers I am speaking of, at the end of the year find themselves with a large stock of potatoes on hand, which, in addition to contributing very much to the support of the family, enables them to keep a fat pig, which again pays their rent. These are clear and practical proofs of the benefit to the labourer of abandoning the system of paying or making up his wages in cider. He, himself, his wife, and family are all much better off; in a physical point of view very much better off; and in a moral point of view, there is no comparison to be instituted between a sober labourer and one who drinks. If no more cider were drunk than that in the fields, and allowed by the farmer, the consequences are bad enough; but the habit of drinking so general amongst the labourers arises out of, and is in a great degree fortified by the practice of the farmer paying wages in the manner mentioned. As soon as a boy begins to work at nine years old, he is encouraged to drink by the farmer, and from that time the habit gains ground, and it is nearly impossible afterwards to eradicate it. I consider the practice of giving a young man cider in lieu of higher wages to be the great cause of the prevalence of the vice of drunkenness in these counties."

Would that all masters were animated by the noble spirit that leads this gentleman to seek the best interests of his work-people! He stands not afar off, crying, in passionate terms, to this and that drunken fellow—"You beast! you brute! be off—I'll have no more of your doings;" and retires to sip his brandy-and-water, and complain of sots in general—he is altogether of a different stamp—he discovers the root of the vice, and with one blow severs it. Nor does he merely *urge* his men to temperance—he does all he can do to stop the practice of drunkenness; he waits not for an edict to put down all beer-shops, but stops the supply of pollution he had been used to issue, and fortifies his men in their efforts to reform by his own example; he comes near to them, and makes them feel practically of what value their abstinence is to them. To show that this gentleman's self-denying efforts are not without results, I will make extracts from evidence taken from some of his own labourers, which I happen to have by me. One states as follows:—

"I left off drinking cider, beer, &c., about five years ago. At the end of twelve months I took to drinking again. I soon left it off again, and have never touched anything of the kind since. I have laboured hard, but I find my health now just as well as those that drink. Last summer I mowed with two men from four in the morning till eight at night: it was job-work. They drank: I did not. They drank a gallon-and-a-half each, but I did my share of the work the same as theirs—quite as well as they did. We were paid 3s. 4d. each a-day during the mowing. I had my potato ground at home, and they their cider. I have gone on in this way for four years. They call me all kinds of names, and laugh at me for not going to the cider-shop; but I laugh at them, and ask if they have paid their rent as I have. I wish all masters did as Mr. ——— does, for I think if the labourers did'nt drink so much, they and their families would get more to eat.

"It is eight years since I had any relief from the parish; if I had been in the habit of drinking, my family would have been in rags. I am sure the liquor would have been doing me no good; but without the potato ground we could not have got on.

"I went to work when I was nine years old; I had 1s. a-week, and three cups of cider a-day. If I had a boy out at work I had rather the cider was turned into cheese. It is a bad thing for young boys to drink as they do; it is as bad with girls nearly. My eldest daughter is eighteen years old. The summer before last she went out to harvest, and had half-a-gallon of cider a-day. The farmers think people work harder with so much cider. I don't think they do. Women are often intoxicated at the end of the day, and young men and women, in drinking all this cider, get together in a very improper way."

Another man says:—

"I don't think cider averages to the farmer more than 1s. a-week for the labouring man; but it costs 1s. 6d. to buy at the shop, and the farmers reckon it at that. I can work just as well as when I drank cider. I find no difference. This summer I mowed without cider. Boys get their half-pints of cider a-day nearly always. I think a piece of cheese would be better, and do them more good. It would perhaps cost the farmer a little more: cheese to the farmer is dearer than cider, but not if cider is bought at the shop."

But I must leave this wretched cider truck system,

for my readers to form their own conclusions upon, at present. I intend to help them to a few, however, when we next meet.

No. XIX.

"The labouring poor, in honour I must say,
Are saucy, mutinous, and beggarly;
Good drunken company is their delight,
And what they get by day they spend by night;
In English ale their dear enjoyment lies,
For which they'll starve themselves and families."

DE FOE'S "*True Born Englishman.*"

A gentleman writing to me from Shiffnall, Dorset, mentions the deplorable effects of the beer truck system, as practised by the farmers there. "This is a sad country for beer," he says; "this is the district for temperance lectures. What would a writer on wages think to 2s. 6d. per acre for mowing, with six quarts of beer? One farmer allows his men three quarts in winter and six quarts in summer: he farms 650 acres. On the next farm, turnip hoeing is done at 4s. and four quarts; and in harvest work there is no limit!!"

What, is it not enough that the farmers of these districts oblige woman to forsake her sphere—throw boys and girls upon the vicious resource of village association, and thus oppose a strong barrier to the labours of the clergyman, and the schoolmaster? Must they yet combine, and agree to level their fellow-men yet more in the dust—to despoil home of any attraction they may have left to it—to corrupt and demoralize our youth by forcing them to, and encouraging them in, a practice that has ever proved so fatal to our country? Some great legal authority, I forget whom, says that three-fourths of the crime annually recorded and punished have their origin in drunkenness. I cannot conceive that the laws of humanity and sense should be so outraged without some semblance of a sufficient motive.

'Tis a physical absurdity, however, to say that men cannot do without such stimulants to labour—a popular error exploded long since, retaining as a special pleader in its cause our inclinations only, and not our reason.

If the evidence I furnished in my last letter is not sufficient, read the following:—

In Dr. Carpenter's Prize Essay on Intoxicating Liquors, he has quoted some statements from the "Inquiries by the Commissioner of the *Morning Chronicle*"—namely, Mr. Mayhew—which seem to imply that a man may carry up as many as sixty tons of coals on his back from a ship's hold, sixteen feet deep, in the course of a-day. "I have backed as many as sixty tons in a-day since I took the pledge," says one man, whom Mr. Mayhew interrogated. "Many teetotallers," continued he, "have backed coals out of the hold, and I have heard them say over and over again, that they did this work with more comfort and ease than they did when they drank intoxicating drinks. Coal backing is the hardest work that it is possible for a man to do. Going up a ladder sixteen feet high with 238 lbs. weight upon a man's back is sufficient to kill any one." Mr. Mayhew—he is not a teetotaller—took great pains to investigate a subject of such vital importance to the working-classes, and "without reference to any preconceived opinion whatever, I was the more particular in my inquiries," says that gentleman, "because I knew there existed a deeply-rooted conviction in the minds of the industrious classes, that hard work could be performed only with the assistance of some kind of fermented liquor; and the result of the investigation most assuredly was, that *such a belief was in no way founded upon truth. It is my impression that stimulating drinks are in no way necessary for the performance of the severest labour.*" I could bring evidence in support of this statement from divers sources, but cannot find space to transcribe it.

It seems to me that the farmers adopt this truck system because it is less expense to them than that of paying men their wages in full. I have grave reason to know that this is not a mere supposition.

Short-sighted, inhuman, cowardly economy this, on a par with another species of economy to be found in these regions, such as the raking of stubbles before the gleaners are admitted to the fields—the privilege granted to the poor of gleaning on condition that the turnip crop shall be singled gratis, and one-half the gleant corn yielded to the master, who comes, or—provided he has any shame left—sends his man at the end of the day, with a cart to receive the stipulated mail. I could not believe that this was the case, until I was positively assured of it—*witness it I could not!*

Economy! Thus to prostitute the term economy, indeed! Liberality, justice, active sympathy, friendship—these are all qualities of economy.

Close-fistedness is not economy; a system of overwork and under-pay is not economy; economy owns not such qualities as oppression and intimidation and servile dependence; nor does true economy seek her food in the vitals of the working-people.

O shun, my friends, such species of economy—a dire curse rests upon it. True economy does not provide that men be reared, from the very dawn of life, amidst scenes of filth, and violence, and crime—blunting every moral sense, and debasing every thought and feeling; nor that many of those pretty cottage homes, or many of those picturesque villages that delight the eye of the traveller, should be preparatory training schools for the gaol.

False economy *does*, and brings 15,000 boys under 17 years of age annually before the tribunals of our country, which is an all-sufficient disgrace to us of

this age. Why, France—ay, even Russia and Austria cause us to blush.

And have we none of *us* a share in the condemnation and guilt thus *manufactured?* Can my readers all acquit themselves in this matter? Society is prompt and stern to punish; but is there not a duty prior to that which is discharged from the bench, the jury, and the witness-box, which is left altogether unfulfilled? Taught to recognize no goodness but that which fills his pocket, no evil but what puts him in the hands of the police, cared for by none, taught no social duty, instructed in no faith, knowing no moral aim or motive, what can be looked for, in a man under such training, but that he should become the daring ruffian, or the determined thief, "regarding the great questions of vice and virtue, honesty and honour, truth and falsehood, as mere matters of circumstance, and calling his crimes misfortunes; their punishment, his ill-luck?"

Those who are even indifferent to the physical and moral condition of the lower classes of our labouring poor are part authors of the boys' depravity, the adults' abandonment.

What share then must we allot to them, of all this evil, who abet its grand causes, and augment the foul tide of national pollution? I will not do this piece of reckoning—let the guilty conscience perform that business in secret for itself—but I will remind my readers that no one of these 15,000 criminal youths falls alone. Each individual criminal has a sphere of influence—small, but certain. Each is the centre of a circle of sympathising and gradually emulous admirers and associates, whose tendencies for the thief-life he fosters, develops, and directs.

"Reckon," says a writer on crime, "but five such satellites of crime to every juvenile delinquent, and we have a mass of at least 50,000 depraved and vicious lads professedly living on the plunder and injury of society." Such facts speak for themselves, and we should be called by them to think very seriously on our social prospects, and our individual responsibilities.

My good reader, if you foster this practice of drinking amongst your work-people, do abjure it. Abjure it for the sake of your own peace, for the sake of those who depend upon you for an example, for the sake of national honour.

Perhaps you think something is going to follow about self-denial. Well—and you are right; for I do believe there never did, and never will, exist anything permanently noble and excellent in a character which is a stranger to the exercise of resolute self-denial. To walk worthily this virtue must support you. Where is your manhood that you esteem *yourself* above your *country*, and prize your *gain* above your *principles?* F. R. S.

"THE WHEAT-CANISTER."

Farmers, millers, merchants, and all interested in the corn trade, are indebted to Mr. Adams for his valuable letter—"On the equalization of the price of wheat by improved storage." The "WHEAT-CANISTER" is an excellent idea, and cannot fail of ultimately being reduced to practice; for although storing grain is contrary to the general practice to which science is at present pointing—as will subsequently be shown—yet storage to a certain extent will always be necessary, and the *wheat-canister* is the very place in which to keep it safe; and, besides this, we shall find it useful in the ordinary operations of marketing, &c.

Our granaries are antiquated beyond date. Science has made no progress here since the days of Joseph; for few now-a-days would venture to store wheat from seven to fourteen years, even in Egypt itself. Their mechanical construction and management are the reverse of scientific, entailing upon parties losses not very easily estimated. Indeed, such is their magnitude, that few think of putting wheat into granary, unless for immediate use. The practice among farmers is the exception when the wheat is fit for grinding, and the exceptionary few who hoard for the purpose of getting higher prices generally lose money. They may gain in such years as the present, but their losses generally far exceed their profit; and those are occasioned by the antiquated character of their granaries, comprising the whole routine of management.

Science appears at present to point to agricultural statistics, improved methods of harvesting and conveying breadstuffs, a more regular supply of fresh-thrashed corn throughout the year, home and foreign, and a more efficient system of drainage, as the best means of equalizing prices and avoiding the many ruinous disasters experienced in connexion with the corn trade. The different parties interested are now all but unanimous on this subject, so that we shall experience but little opposition in the proof of our proposition, which will be briefly discussed under the four heads into which it divides itself.

1. *Agricultural statistics.*—The year has not existed since the days of Noah, in which the earth has not yielded an ample supply of food for all its inhabitants. Famine has, no doubt, been experienced in individual kingdoms, and even over large areas of the globe at one time; but such, if the facts of the case are minutely examined, will be found to have arisen either from those kingdoms being politically or physically shut out from the supply of the rest of the world, or some such cause. The question is one of distribution, not want. In 1847—so often referred to, for instance, as similar

to the present—there was no want of bread-corn in the world, had it been timely and properly divided; for, while we were selling wheat in England at 100s. per qr., many farmers in Canada West and interior of the States could not make much above a dollar per bush., and were unable to dispose of the whole, the price not paying conveyance to a distant market. England imported that year nearly 3,000,000 qrs. above her supply of previous years; and had she been properly acquainted with the statistics of the world, and had access to every province, the probability is that double this quantity could have been had. But, be this as it may, it is manifest that the commercial crisis experienced would have been avoided. Again, had the statistics of the wheat crops of 1852 and 1853 been properly known in time, there would not have existed a fluctuation of 100 per cent. in the price of the former. Before such would have been allowed, farmers and millers would have turned the wheat-canister to some advantage, supposing it had existed. It is manifest, therefore, that agricultural statistics will not only equalize the price of wheat in different kingdoms, but over the whole world.

2. *Improved methods of harvesting and conveying corn to the best market.*—The quality of wheat is often much injured in the harvesting, and in being conveyed to market by sea; while many parts of the world are not yet accessible to the British market, for the want of railroads to convey their produce to seaports or navigable rivers. Rapid progress, however, is everywhere now being made in the latter, and in a few years the world—so far as civilized—will be pretty well intersected by railways; but in harvesting and shipping, improvement is yet very much wanted. Millers and bakers have often much reason to complain of the samples shown them; while the position of sellers—for the want of the wheat-canister, or something of the sort—requires no comment; for the losses they annually sustain would pay a long per-centage on capital invested in galvanized sheet iron. We speak here from no little experience.

Drying corn in harvest, in the sheaf, by artificial means has often been mooted in this country; but the drying of wheat in canisters, by means of a current of heated air, is deserving of something more than a passing notice. At present we cannot do it justice, and beg to express a hope that millers and others interested will give us a helping hand. If farmers could dry soft wheat in canisters, they would often experience less difficulty in disposing of remainders in harvest, or of stacks offering to "heat," than they now have. The question here is not between wheat sun-dried in the shock (or stook) until in the best state for grinding and soft wheat dried in a canister, but between the latter and heated and sprouted wheat; and, from the difference of value which must be between them, there cannot be a doubt but the theory of drying, through the instrumentality of the air-pump and a current of dry heated air, is deserving of an experiment. The injury which wheat receives from kiln-drying arises principally from the partial stagnation of moist and heated air in the mass during the process—one resembling the cooking of potatoes by steam. But were this air removed by artificial means rapidly, at a low temperature, much less injury would be sustained; and the question arises—Could not air dry wheat without injury at all, or with as little as the sun? The experiment cannot be too soon tried; and there was never a season more favourable for carrying it out than the present.

Wheat and flour—however good may be the condition in which they are shipped—are difficult to be preserved long at sea, in bulk, sacks, or barrels. The loss annually sustained in this department is incalculable, and doubtless might be obviated by means of hermetically-sealed canisters; or if the hold of vessels were made air-tight by being lined with metal, the hatchways hermetically sealed, and the air extracted, the same object might be obtained at less expense. This would require strong vessels. To an isolated and manufacturing country like Britain — depending so much upon imports of breadstuffs, and having colonies at such distances from her shores, growing more than they require for their own consumption, and requiring manufactured goods in return—the subject is deserving of the practical consideration of the Governments of England and the United States of America, and the exporting states of the Baltic, Black Sea, and Mediterranean. It would not cost much to fit up a vessel or two for the purpose on both the plans suggested. By the former alone, about 20,000 wheat-canisters, each containing 1 cwt., would be sufficient for a trial; and they would be useful in her Majesty's navy after the experiment, supposing the worst.

3. *A regular supply of fresh thrashed Wheat.*—This has long been a favourite theory among farmers, millers, and the whole trade. Wheat and straw always keep best in the stack, when properly harvested; and for farmers to thrash as fast as millers grind, and millers to grind no faster than bakers consume, is doubtless s und practice as well as theory, being that which will procure for all parties the highest profit and greatest satisfaction. The old plan of thrashing out the whole of the crop during the winter months, and throwing the wheat into the hands of merchants, millers, and bakers, is fast being done away with, as inimical to the interests of all parties; for the improved methods of house-feeding cattle demand fresh-thrashed straw of the farmer daily throughout the year; while, on the part of the buyers, it requires more capital, more granary room, and more expense of labour, besides deterioration of quality, risk from fluctuation in price, fire, &c., and the opportunity it affords to wild speculation, increasing the amount of capital required by the regular trader, who has his customers to serve, much above what it otherwise would be. What is true of fresh thrashed home-grown wheat, is also true of foreign; for science is not one thing in England and another on the continents of Europe and America. We may therefore conclude under this head generally, that progress in each of those departments would do much to equalize the price of wheat, enhance its intrinsic value, and avoid losses; for experience has long since taught all parties that a good article secures

the best customer, and that a regular trade with fair profits is far better than large profits at one time with larger losses at another—a conclusion which cannot be obtained without the "wheat-canister."

4. *Efficient Drainage.*—This subject is now being discussed in our leading columns, and therefore all we shall say upon it is, that there cannot be a doubt but much of the short-comings of the past year would have been obviated under efficient drainage. We do not here merely allude to lands not drained, but also to those imperfectly drained; in short, we have yet to learn draining at the school of practice, and the last year's experience may be taken as the first lesson.

Such are the four propositions of science, in the second of which the *wheat-canister* occupies a prominent place; and although storing wheat from one year to another is against their general purport, yet it forms one of those exceptions occasionally to be met with in practice, rendering the merits of the wheat-canister more deserving of notice than otherwise it would be, for the more that storing becomes the exception, the greater is the risk, and hence the necessity for its use.

There is nothing new under the sun—nothing new, as Mr. Adams observes, in the principle of the wheat-canister; for storing corn in hermetically sealed granaries or stores, above or below ground, is as old as the world itself; for "corn," says Loudon in his Cyclopædia of Agriculture, "may be preserved for many years by first drying it thoroughly in the sun, and then burying it in dry cool pits, and closing these so as effectually to exclude the atmospheric air. In a short time the air within is changed to carbonic acid gas, in which no animal will live, and in which, without an addition of oxygen or atmospheric air, no plant or seed will vegetate. The corn is thus preserved from decomposition, from insects, vermin, and from vegetation, in a far more effectual manner than it can be in a granary. In this way the Romans preserved their corn, in chambers hewn out of dry rock; the Moors, in the sides of hills; the Chinese, at the present time, in deep pits in dry soil; and the aboriginal nations of Africa, in earthern vessels hermetically sealed." "The shape of these corn jars is nearly that of an egg-shell," and "between four and five feet high and three wide." "The Russians in the interior of the empire preserve their corn in subterranean granaries, of the figure of a sugar-loaf—wide below and narrow at top: the sides are well plastered, and the top covered with stones. They are very careful to have the corn well dried before it is laid into these storehouses, and often dry it by means of ovens, their autumn being too short to effect it sufficiently." Then follows his own conclusion:—"A granary to preserve corn for many years should be a dry cellar, deeply covered with earth; and after the corn is put in, hermetically sealed, to exclude heat, air, and moisture, and preclude the possibility of the grain vegetating, or of the existence of insects and vermin."—[We have given these extracts *verbatim*, because of their brevity and being to the point].

The difference between the corn-jar of the Hottentots and Mr. Adams' wheat-canister—the pits of the Romans, Russians, Chinese, and Moors, and his tank or "reservoir" under ground or above it—lies in the materials of which they are constructed; and this difference is obviously in favour of galvanized iron. The extraction of the air by means of the air-pump is also superior to keeping the corn in an atmosphere of carbonic acid gas. These improvements would, no doubt, incur a little extra expense beyond the old practice; but if the grain is preserved better, as it doubtless would be, galvanized iron might be the cheapest in the end. This, however, is a question which experiment must determine, and one on a small scale of a few years' duration would not cost the two commercial companies of the Corn Exchange much. Twenty feet off the end of a granary or cellar might be fitted up, or the hulk of an old vessel in the river. We may yet live to see floating granaries riding at anchor, or being towed from port to port as circumstances demand.

Wheat would not improve by age, like wine. We can hardly suppose this. On the contrary, we fear the odds would be against it, however carefully canisters were filled with dry wheat and exhausted of air; but, if properly dried, the deterioration would be comparatively little. In practice it but too frequently occurs that a very serious injury is sustained before it leaves the hands of farmers; and, when this is the case, the damage by sea is so much the greater. They must often thrash, for the sake of the straw for their cattle, when wheat, barley, or oats are unfit for marketing; and for the want of proper granary room for drying, or to avoid the expense and even risk from moist weather, offer it on terms which tempt a purchaser; hence the consequences which follow when such is thrown into the hold of a vessel even in our coasting trade—twenty quarters or so setting fire to a whole cargo, as it were. Such cargoes could never afterwards be stored in canisters for any length of time. The surplus of seven years of plenty could not be stored to meet even one year's short-comings.

In conclusion, the *wheat-canister* is a subject worthy of a little discussion with agricultural statistics, and promises to be an important mechanical auxiliary in the hands of modern science.

SLUGS.—At the present time ploughing of land proceeds continuously, as it has done during November, in consequence of the very fine weather that has succeeded to the rains of the last month, wherein more than 4 in. are reported to have fallen Wheat sowing keeps pace with the ploughing, as we learn from observation and extensive correspondence. But, as a result of the moist state of the land, slugs and molluscous vermin fearfully abound, and it has been seen that serious depredations have already been committed on some crops. Salt and powdered quicklime (air-slaked will do also) are the best known and approved applications; but some caution is required with the former, because, if it fall upon green vegetation, it becomes almost immediately destructive, whereas powdered lime may be freely scattered over young plants with safety. The only material objection to *lime*, is that it is rendered nearly useless by the first shower of rain. If *salt* be liberally sprinkled twice, night and morning, over a fresh-ploughed or harrowed surface, it will certainly destroy all the slugs which it touches. Farmers

are, or ought to be, aware of these facts. I embrace the present opportunity, however, chiefly to state the following, which I learned from a Berkshire farmer:—He had observed his autumn-sown wheat, just sprouting, to be gradually disappearing; and, knowing that slugs became busy at nights, he lighted his lantern and walked to one of his wheat fields. The light revealed numbers of bright *shining spots* in every direction. Without loss of time he roused some of his men, ordered out the rollers, and, before eleven o'clock, had passed them over great breadths of his growing corn, thus inflicting summary punishment upon myriads of the enemy. The hint may be worthy of attention.—J. T., *Croydon.*

THE AUTUMN CLEANING OF STUBBLES.

The readers of these columns will remember how diligently we have, year after year, impressed upon them the necessity of doing something towards cleaning the stubbles at this season. We need hardly recapitulate the arguments we have used annually: the facts and principles on which they are based are now pretty generally admitted. These are, that immediately after harvest, the roots of plants are so near the surface that they are easily separated from the soil; that they are strong and at this period have a tendency to come out of the soil in clusters, instead of breaking into small pieces, as they will do when they have added a subsequent growth of tender fibres; that if *loosened* and *arrested* in autumn, they make no winter progress and often die by the action of winter exposure; that the more cleaning is done in autumn, the less there is to do in spring, and the less dependent the farmer is on a fine clearing season then; that the soil may be kept still in a dry season, and the moisture kept in the soil so as to render the sowing of turnips a matter of greater certainty at the proper period. These are a few of the advantages of autumn cleaning, independent of the fact that the roots being arrested in growth, the impoverishment of the soil follows to be far less than when they are growing all winter, while the leaves, deprived of their vitality, soon decay, and improve the condition of the soil.

This is all very good; but who could last year, who can this year, do any good in their soils by autumn cleaning? The weather has been so wet that the land could not be touched, and nothing is done, and indeed nothing can be done.

Now we hesitate even at this. The action of root weeds, especially couch, the great enemy of stubbles, the great drawback of the turnip cultivation, is immediately after harvest to send the roots directly downwards. This results from the stimulus of oxygen, and is due to the same principle as a closely planted plantation will have a tendency to draw up the trees and to make their roots spread on the surface; thinning makes them shoot out side branches, and the roots strike deeper into the earth.

Hence the mere loosening of the soil at the surface so deep in fact as the root goes, will at once arrest their growth, will stop their progress downwards, and therefore will render their future clearing out, whether in autumn or in spring, a matter of much less difficulty. Take for instance a square rood or a square perch of land. If roots proceeding three inches deep require the working over of ten tons of earth, in order to bring them to the surface and so get rid of them, it must be clear that if they proceed six inches, twenty tons will have to be removed to effect the same object. Hence it must be manifest that the nearer the surface the roots can be kept, the easier by far will be their removal from the soil. We pretend not to say ten tons is the exact quantity: it may be fifteen, or twenty, or any other amount; but the principle holds good in any case whatever, that double the weight of earth has to be worked over every time the root-weed doubles its depth in the earth.

Now, in a wet season, one of difficulty ever so great, it is best simply to scarify, even if nothing else can be done. Ducie's scarifier is good for a large farm; for a smaller, Bentall's broadshare will be equally serviceable, only let the operation be performed directly after harvest.

But what can be done in strong land—in loam approaching to clay? We do not think that, liable as this is to get too wet to plough, or drag, or scarify, or clean, the case is quite hopeless. A double ploughing will here effect all the objects of surface cleaning. Clay is different from sand. The couch requires a large supply of oxygen, and hence, if buried deep in clay or loam may be expected to make its appearance no more. A thin sod pared by the paring plough, the broadshare, or even the common plough with a sock set with a wide wing, will take off the root weeds; while a deep nine-inch furrow, rather narrow, after this, will form a groove in which the couch, &c., may be for ever buried, to form the substratum of food for a future generation of plants. Amongst the successful application of this principle is the case related by Mr. Grey, of Dilston, to the secretary of the Royal Agricultural Society of Improvement, Ireland.

He took a farm into his own hands in Tweeddale, which was very foul and full of couch. He pared off 3 to 4 inches of the surface, followed with a plough and four horses, going 6 to 8 inches deep,

and into this groove the thin sod was thrown and buried. This sealed up the couch, so that very little of it survived; and in April it was cross-ploughed 12 to 13 inches across; it was friable, and free from live couch.

Here is hope for the strong-land farmer, in a season even as difficult as this; but it is perhaps only on soils somewhat deep that this can be successfully carried out. If the soil be very open, the couch will not be killed, because the air will not be quite excluded; while if the soil be very thin, the same depth cannot be attained, but in general either a scarifying and surface exposure on light soils, and a scarifying and deep ploughing on strong, will be practicable on land intended for turnips.

Another resource still is, where the soil needs pulverization as well as destruction of weeds, to ridge up the land as if for potatoes, and split up and ridge again, to pick out the root weeds and sprout the annuals. Even the manure may be put in these drills, in some cases, with advantage, and semicircular harrows, similar to the potato harrows, used to harrow down the surface, which may again be ridged up. A great many schemes ought to be tried rather than altogether give up the autumn cleaning of stubbles.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

CONSECUTIVE ANALYSIS OF THE STOCK SHOWN AT THE GLOUCESTER MEETING.

(Concluded from page 407.)

PIGS.

As with the Sheep classes, the Pigs generally gave but little evidence as to the working of over-feeding prohibition. The jury passed over many, in the larger sorts more especially, that they might have condemned, with very fair showing for so doing. As a whole department, the Pigs made a creditable feature in so important a meeting; the smaller varieties, perhaps, having the preference for "fancy" or very high breeding.

CLASS I.—BOARS OF A LARGE BREED.

592. J Boughton, of Adsett Court, near Westbury-upon-Severn, Gloucester, a white Essex boar. Rump down.

593 W. T. Dewe, of Manor House, Coates, near Cirencester, Gloucester, a black cross-bred boar. Rump too short.

594 J. Harrison, jun., of Heaton Norris, near Stockport, Lancaster, a white and blue large boar. Very good, too fat, short, and well made.

595 R. Cressley, Holland-street Mills, Platting Newton, near Manchester, a pure large Lancashire boar. Beautiful broad back, rather too curved, leaving the tail and rump too low; snout short and concave, ears thin, fine countenance; flesh too loose and skin too pliant; hair curled. A very capital pig, and not too fat. First prize.

596 S. M. Pell, of Ty-Maur, Llanfrynach, near Brecon, a white improved Lincoln boar. Rather inferior as a whole.

597 H. Blandford, of Sandridge, near Chippenham, Wilts, a black and white true Berkshire boar. Coarse hair; well made up.

598 M. Cartwright, of Stanton Hill, near Burton-on-Trent, Stafford, a white Stanton boar. Good back and well formed; low rumps.

600 and 601 F. S. Blakely, of Penrhos Court, near Kington, Hereford, two white boars. 600 ordinary pig. 601 small.

602 T. Horsfall, of Burley Hall, near Otley, York, a white Yorkshire boar. This is a well-formed pig; great depth of frame, snout short and concave, ears thin and up; good throughout. Second prize.

603 G. E. Taylor, of Oatlands, near Leeds, a white boar. Good; rather too thin; ears up.

CLASS II.—BOARS OF A SMALL BREED.

604 W. Culliford, of Hayling Island, near Havant, Southampton, an old improved Dorset black boar. Too small.

605—610 G. Mangles, of Givendale, near Ripon, York, three improved Cumberland white boars, two improved Yorkshire white boars, and an improved Cumberland black and white boar. A very useful, good lot; match well.

612 and 613 The Hon. C. Ponsonby, of Hatherop, near Fairford, Gloucester, two white boars. Pretty neat frames.

614 R. Hill, of Bach Hall, near Chester, a white boar. Good form, but narrow loin.

616 S. Druce, jun., of Eynsham, near Oxford, an improved Oxfordshire black boar. Rather too coarse for small breed.

617 W. M. Barber, of Langley Broom, near Slough, Bucks, an improved Middlesex white boar. Very useful pig.

618 H. L. Bean, of Backwell Hill, near Bristol, Somerset, an improved Essex black boar. Pretty form, good back, but too small.

619 W. Sandy, of Holmepierrepoint, near Nottingham, a Cumberland white boar. Good fore-quarter; loin narrow; too coarse.

620 and 621 J. Dixon, of West Brook Place, near Bradford, two small Essex black boars. 620 narrow back, good depth, rump low. 621 great depth, thin back, good thighs.

622 H. S. Hayward, of Folkington, near Willingdon, Sussex, a white boar. Pretty frame, good shoulders, rump short.

623 E. Akroyd, of Denton Park, near Otley, York, an improved Essex black boar. Deep frame, good thighs, short legs, too fat.

624 T. Craven, of Whitley-street, Manningham, near Bradford, York, a small white boar. Very useful; do for large breed; too narrow.

625 and 626 W. Northey, of Lake, near Lifton, Devon, two improved Leicester black boars. 625 a very good pig, and disqualified; too fat. 626 a very good animal, and well formed; might be somewhat improved; neck rather too thin, ears too short, and rump too short for a first-class pig. 1st prize.

628 W. Ludlan, of Bradford, Yorkshire, a pure small white boar. Prettily formed, but rump low.

629 W. Adams, of Leighton Cottage, Spring-street, Birmingham, an Essex black boar. Rump too low, and bad.

630 W. Bailey, of Barnsley, York, an improved Essex black boar. Deep frame, narrow back.

631 The Duke of Beaufort, of Badminton, near Chippenham, Gloucester, a small white boar. Good chine and shoulders, low rump.

632 C. L. Clare, of Hindley House, Liverpool, an improved Essex black boar. Frame rather narrow.

633 and 634 R. P. Davies, of Thornbury Park, near Thornbury, Gloucester, two Yorkshire white boars. Two pretty pigs, but not first-class ones.

636 and 637 D. Leeming, of Little Blackwood House, near Halifax, York, two small black boars. 636 short and thick. 637 back long, frame not good.

638 J. Moon, of Lapford, near Crediton, Devon, an Essex black boar. A very good pig; well-formed chine and shoulders, loin and rump rather narrow, snout short, cheeks fat, hair good. 2nd prize.

639 I. Pearce, of Bishopstron, near Warminster, Wilts, a Berkshire spotted boar. Large enough for any breed.

641 T. Horsfall, of Burley Hall, near Otley, York, a small white boar. Well-formed fore-quarters, and good back.

642 Rev. C. T. James, of Ermington, near Ivy Bridge, Devon, a true Cumberland white boar. Good loin and rump.

645 and 646 Lord Wenlock, of Escrick Park, near York, two small white boars. Rather narrow frame.

647 R. B. Hill, of Bach Hall, near Chester, a white boar. Fair, good frame.

CLASS III.—BREEDING SOWS OF A LARGE BREED.

650 H. S. M'Clintock, of Randalstown, Antrim, a Berkshire black and white sow. Small; ought to be in small breed class.

51 E. Bowly, of Siddington House, near Cirencester, Gloucester, a Berkshire black and white sow. Good sow; thin neck.

3 E. Ruck, of Castle Hill, near Cricklade, Wilts, an improved Gloucestershire black and white sow. An extraordinary animal; very good.

654 W. Sanday, of Holmepierrepoint, near Nottingham, a Cumberland white sow. Very long; too narrow frame.

656 T. Craven, of Whetley-street, Manningham, near Bradford, York, a large blue and white sow. A capital sow; long, of great depth, stands high, good heavy thighs, back not broad enough, flank thin, ears and snout good, stands badly on her legs. Prize.

659 H. Blandford, of Sandridge, near Chippenham, Wilts, a pure Berkshire black and white sow. A good broad-set framed sow; rump too low.

662 Rev. C. T. James, of Irmington, near Ivy Bridge, Devon, a Neapolitan and Berkshire black sow. Good deep frame; ears down.

667 T. Horsfall, of Burley Hall, near Otley, York, a white sow. A fine large sow, with five fat sucking pigs; she does not appear to give any milk.

CLASS IV.—BREEDING SOWS OF A SMALL BREED.

668 G. Mangles, of Givendale, near Ripon, York, an improved Yorkshire white sow. Too fat, but long and good

672 and 673 Hon. Charles Ponsonby, of Hatherop, near Fairford, Gloucester, two white sows. Very fat.

676 S. Druce, jun., of Eynsham, near Oxford, an improved Oxfordshire black sow. A good useful sow; rather too large for the class.

678 and 679 H. S. Hayward, of Folkington, near Willenden, Sussex, two Sussex white sows. Two very useful sows.

680 J. Lowe, of the Bull-ring, Birmingham, an Essex black sow. Bad; ought not to be shown.

684 and 685 W. Northey, of Lake Lifton, near Lifton Devon, two improved Leicester sows. Two very good sows; too fat for use.

687 C. Randell, of Chadbury, near Evesham, Worcester, an improved Worcestershire white and grey sow. Too coarse for class.

688 W. Ludlam, of Bradford, York, a pure small white sow. Long and good; too fat.

690 W. M. Barber, of Langley Broom, near Slough, Bucks, a Berkshire black and white sow. Coarse; fair; not a very good one.

691 and 692 The Duke of Beaufort, of Badminton, near Chippenham, Gloucester, two small white sows. Two very fat and good little sows.

694 C. L. Clare, of Hindley House, Liverpool, an improved Essex black sow. Good.

695 C. L. Clare, of Hindley House, Liverpool, a Clare's improved Essex black sow. Good, but almost too coarse for the class.

696 R. B. Hill, of Bach Hall, near Chester, a small white sow. Very good back, but brisket thin.

697 and 698 T. Horsfall, of Burley Hall, near Otley, York, two improved Yorkshire small white sows. Good sows; large enough for another class.

699 The Hon. Mrs. Howard, of Milbourne, near Malmesbury, Wilts, a Yorkshire white sow. Small sow, with large legs.

700 C. Lambert, of Sunk Island, near Ottingham, York, a New Forest black sow. Capital chine, loin, narrow-rump sow.

701 D. Leeming, of Little Blackwood House, near Halifax, York, a small black sow. Rump bad.

702 D. Leeming, of Little Blackwood House, near Halifax, York, a small white sow. Rather long; too nearly allied to large breed; 8 pigs; curly hair.

703 D. Leeming, of Little Blackwood House, near Halifax, York, a small black sow. Similar in character; back thin.

704 D. Leeming, of Little Blackwood House, near Halifax, York, a small black sow. Rump up; pretty frame.

705 J. Moon, of Lapford, near Crediton, Devon, an improved Essex black sow. This was the most perfectly-formed pig in the yard; the exceptions, if any, are that the rump or tail is a little too low, and thigh twist, and flank too light; prize.

706 J. Moon, of Lapford, near Crediton, Devon, an improved Essex black sow. A good sow; thigh and rump defective, like 705.

707 M. Newman, of Court Farm, Hayes, near Uxbridge, Middlesex, an improved Essex and Bucks black sow. Thin and narrow.

708 Hon. C. Ponsonby, of Hatherop, near Fairford, Gloucester, a small Yorkshire white sow. Fine shoulders; back narrow.

709 S. Ashton, of Peter-street, Manchester, a pure small white sow. A very good sow; chine and neck good.

710 S. Ashton, of Peter-street, Manchester, a small purple and white sow. This should be in large breed class; long and thin, but deep frame.

712 T. Horsfall, of Burley Hall, near Otley, York, a small Yorkshire white sow. A good frame, and fat.

713 and 714 Rev. C. T. James, of Ermington, near Ivy Bridge, Devon, two improved Essex black sows. Two very good sows; rumps too low.

715 and 716 S. Munro, of 71, Broughton road, Salford, Lancaster, a small black sow and a small white sow. The former, a fair chine; thin low rump. The latter, similar frame, but no hair.

718 G. E. Taylor, of Oatlands, Leeds, York, a small white sow. Good form, too fat.

719 and 720 W. Ancell, 7, Cumberland-street, Manchester, a black Essex sow and an improved Neapolitan slate-coloured sow. Two very useful sows.

722 Lord Wenlock, of Escrick Park, near York, a small white sow. Deep frame. Three sucklers.

CLASS V.—BREEDING SOW PIGS, OF A LARGE BREED.

723 W. M. Barber, of Langley Brown, near Slough, Bucks, a pen of three improved Berkshire black and white sow pigs. Three good sow pigs.

724 W. J. Sadler, of Bentham Purton, near Swindon, Wilts, a pen of three Berkshire dark and white sow pigs. (Prize.)

725 W. Hewer, of Sevenhampton, near Highworth, Wilts, a pen of three Berkshire black and white sow pigs. Good, and weight corresponding.

727 J. Theyer, of Crickley Hill, Badgeworth, near Cheltenham, a pen of three cross-bred dark and light spotted sow pigs. An ordinary lot.

CLASS VI.—BREEDING SOW PIGS, OF A SMALL BREED.

728 S. Druce, jun., of Eynsham, near Oxford, a pen of three improved Oxford black sow pigs. Good sows; rather thin chines; too coarse for class.

729 and 730 W. M. Barber, of Langley Brown, near Slough, Bucks, two pens of three improved Middlesex white sow pigs. Two useful equal lots; rather too coarse for class.

731 The Earl of Radnor, of Coleshill, near Farringdon, Berks, a pen of three white sow pigs. Three pretty little ones.

732 H. S. Hayward, of Folkington, near Willingdon, Sussex, a pen of three white sow pigs. Three pretty little ones.

733 W. Northey, of Lake Lifton, near Lifton, Devon, a pen of three improved Leicester black sow pigs. Well formed, deep bodies, good rumps; good quality; correct in frame.

734 The Duke of Beaufort, of Badmington, near Chippenham, Gloucester, a pen of three small white sow pigs. Pretty little fat pigs.

735 C. L. Clare, of Hindly House, near Liverpool, a pen of three improved Essex black sow pigs. Beautiful in quality.

736 S. Bowly, of Gloucester, a pen of three Essex black sow pigs. Beautiful in quality; rumps correct.

737 Lord Wenlock, of Escrick Park, near York, a pen of three small white sows. Excellent quality, and good frames; good.

POULTRY.

We have carefully gone over these classes, and appended our remarks as in the stock classes, but want of space forbids our laying the whole before our readers in the same consecutive form; we will, therefore, only give our notes as jotted down at the time of inspection upon those pens which struck us as being most worthy of notice. The show, as a whole, was highly creditable to the exhibitors, and formed a very interesting and attractive feature in the show yard.

DORKING FOWLS.

CLASS I.—COCK AND TWO HENS (Chickens of 1853).

742 Viscount Hill, of Hawkstone, near Shrewsbury, grey Dorkings. A fair lot, but rather small. Highly commended.

743 Dr. Hitchman, of Mickleover, Derby, single-combed speckled Dorkings. A very fine cage of birds, and well grown. Highly commended.

752 Capt. Hornby, R.N., of Knowsley Cottage, near Prescot, Lancaster, grey Dorkings. Is a cage of very fine plump fowls, and of extraordinary size, considering their age, only 4 months and 2 weeks. 1st prize, £5.

754 J. Lewry, of Hand Cross, near Crawley, Sussex, single-combed grey speckled Dorkings. Is a cage of splendid birds, standing high. 3rd prize.

757 J. Lewry, of Hand Cross, near Crawley, Sussex, grey speckled Dorkings. A cage of fine large-framed birds. 2nd prize, £3.

760 E. Terry, of Aylesbury, Bucks, light brown or speckled Dorkings Large fowls; dark colour. Commended.

771 A. Wilcox, of Nailsea Court, near Bristol, grey Dorkings. Very good fowls.

772 T. T. Parker, of Astley Hall, near Chorley, Lancaster, grey or speckled Dorkings. Three very good and noble-looking fowls. 4th prize, £1.

CLASS II.—COCK AND TWO HENS.

775 H. Smith, The Grove, Cropwell Butler, near Bingham, Notts, grey Dorkings. Three very fine fowls, large and plump. Highly commended.

776 J. Fairlie, of Cheveley Park, near Newmarket, single-combed grey speckled Dorkings. Fine fowls; peculiar dark colour; plump and good. Highly commended.

784 and 785 Viscount Hill, of Hawkstone, near Shrewsbury, grey Dorkings. 784 very good, but delicate frames: 3rd prize, £2. 785 the hens were different in colour; a very good cock: highly commended.

789 G. Jesty, of Druce Farm, Puddletown, near Dorchester, Dorset, brown Dorkings. A very fine cock, and good hens, but two colours.

790 J. Dixon, of Westbrook Place, near Bradford, York, single-combed silver Dorkings. Very large, fat, and plump; different colours.

795 and 796 Capt. Hornby, R.N., of Knowsley Cottage, near Prescot, Lancaster, grey Dorkings. 795 three very fine fowls; hens large, plump, and good, but not showy: 1st prize, £5. 796 a fine showy cock; hens plump and good, but small: 2nd prize.

798 and 800 J. Lewry, of Hand Cross, near Crawley, Sussex, single-combed dark speckled Dorkings. 798 very good; stand high; narrow combs: commended. 800 a very fine cock; legs strong, plump, and full make; hens pretty, and large: highly commended.

803 C. Rawson, of The Hurst, Walton-on-Thames, Surrey, single-combed Dorkings. Very large fowls; cock an immense comb.

810 T. Lyne, Malmsbury, Wilts, speckled Dorkings. A very fine, plump cock; hens not equal, but good. Highly commended.

815 T. T. Parker, of Astley Hall, near Chorley, Lancaster, grey Dorkings. Two very handsome hens, and peculiarly handsome cock. 4th prize, £1.

SPANISH FOWLS.

CLASS III.—COCK AND TWO HENS.

824 J. P. Adams, of Newland, near Malvern, Worcester, black Spanish fowls. Three fine-formed fowls; handsome. 4th prize, £1.

825 and 826 Capt. Hornby, R.N., of Knowsley Cottage, near Preston, Lancaster, white-faced Spanish fowls. 825 three large and handsome fowls; plump and good: 2nd prize, £3. 826 three still finer, and more beautiful; high and noble looking: 1st prize, £5.

827 D. Leeming, of Little Blackwood House, near Halifax, York, black Spanish fowls. Three good plump fowls.

833 W. B. Mapplebeck, Bull Ring, Birmingham, black Spanish fowls. Rather small, but beautiful in form. 3rd prize, £2.

COCHIN CHINA FOWLS.

CLASS IV.—COCK AND TWO HENS.

836 J. Fairlie, of Cheveley Park, near Newmarket, buff Cochin China fowls. A cage of large and well-grown fowls.

847 S. R. Herbert, of Powick, near Worcester, white Cochin China fowls. Three very fine and beautiful birds. 3rd prize, £2.

848 H. S. Pigott, of Brockley Court, near Bristol, buff and Cinnamon Cochin China fowls. Very good fowls.

856 C. Punchard, of Blunts Hall, near Haverhill, Suffolk, light-coloured Cochin China fowls. Noble looking, and very good. 2nd prize, £3.

859 C. Rawson, The Hurst, Walton-on-Thames, Surrey, buff Cochin China fowls. Three very good white fowls. Commended.

864 E. Terry, of Aylesbury, Bucks, buff Cochin China fowls. Three very fine, large and plump, noble-looking birds. 1st prize, £5.

870 W. C. Gwynne, M.D., of Sandbach, Cheshire, grey Shanghae Cochin China fowls. A very fine lot, and good; rather delicate looking. 4th prize, £1.

GAME FOWL.

CLASS V.—COCK AND TWO HENS.

887 N. N. Dyer, of Bredon Manor House, near Tewkesbury, Worcester, black game fowls. A beautiful cock, but hens rather small. 1st prize, £3.

890 E. Glover, of Olton, near Solihull, Warwick, black-breasted red game fowls. Same in character; fine in symmetry and beauty. 3rd prize, £3.

899 E. Lowe, of Comberford Mills, near Tamworth, Staffordshire, black-breasted red game fowls. Same in character; very fine and good. 2nd prize, £2.

908 W. W. Rave, of Longbrook, near Milton Abbot, Devon, game fowls. A very good cock; hens fair.

HAMBURGH FOWLS.

CLASS VI.—COCK AND TWO HENS.

(Gold and Silver Spangled or Pencilled.)

918 T. Lowe, of Whateley, near Fazeley, Staffordshire, silver-pencilled Hamburgh fowls. Handsome, but not profitable. 3rd prize, £1.

923 J. Jennens, of Moseley, near Birmingham, silver-spangled Hamburgh fowls. Much finer form; beautiful and fat; large combs. 2nd prize, £2.

927 J. B. Chune, of Seven Cottage, Coalbrookdale, Salop, golden-pencilled Hamburgh fowls. Very delicate and beautiful; colour beautifully spangled.

928 W. Ludlam, of Bradford, York, golden-spangled Hamburgh fowls. Three admirably formed fowls of great beauty, but not profitable. 1st prize, £3.

This is a class of doubtful character as to profitable breeding.

MALAY FOWLS.

CLASS VII.—COCK AND TWO HENS.

941 J. Dixon, of Westbrook Place, near Bradford, York, Malay fowls. A large cock, and good hens.

944 A. C. Sayers, of Clanville House, near Andover, Hants, Malay fowls. A symmetrical lot, but too much leg, and little flesh. 1st prize, £3.

949 W. B. Mapplebeck, Bull Ring, Birmingham, Malay fowls. Same character. 3rd prize, £1.

1110 A very good and symmetrical lot, but still higher standing. 2nd prize, £2.

These birds have too much frame and little meat as a class.

POLAND FOWLS.

CLASS VIII.—COCK AND TWO HENS.

960 J. Dixon, of Westbrook Place, near Bradford, York, silver Poland fowls. Three large fine-formed fowls, with immense feathery toppings.

963 C. Rawson, of The Hurst, Walton-on-Thames, Surrey, black and white topping Poland fowls. Very large tufts; buff and black. Commended.

965 C. Rawson, of The Hurst, Walton-on-Thames, silver-spangled Poland fowls. Very good of their kind; beautiful plumage, good size, and large tufts. 1st prize, £3.

966 W. Cox, Brailsford Hall, near Derby, gold-spangled Poland fowls. Same colour and character; not so large, but immense tufts. 2nd prize, £2.

970 W. G. Vivian, of Singleton, near Swansea, white Poland fowls. Beautiful white; splendid tufts. 3rd prize, £1.

We cannot think any of the last three breeds of poultry would be very profitable to adopt for farm-yard poultry.

TURKEYS.

CLASS IX.—COCK AND TWO HENS.

974 and 975 J. Fairlie, of Cheveley Park, near Newmarket, English turkeys. 974 a cage of good birds, but not first-class. 795 a cage of very large and useful birds; profitable in character: 2nd prize, £3.

976 Vis. Hill, of Hawkstone, near Shrewsbury, American turkeys. Three of the handsomest and finest turkeys we ever saw; plumage beautiful. 1st prize, £5.

981 R. T. Head, of The Briars, Alphington, near Exeter, wild American turkeys. Three very good, plump, and profitable birds. 3rd prize, £2.

A very slender competition in this class.

GEESE.

CLASS X.—GANDER AND TWO GEESE (of 1853).

982 Miss A. F. Vernon, of Barnwood, near Gloucester, large grey and white geese. Three very good and profitable birds. Commended.

983 J. Fairlie, of Cheveley Park, near Newmarket, common English geese. Three very good and profitable birds. Commended.

986 Rev. J. Herbert, of Leigh Parsonage, near Reigate, Surrey, grey geese. Very large, fat, and plump. Highly commended.

991 R. Glover, of Holt Hall, near Fazeley, Stafford, white geese. Very good. Highly commended.

993 Capt. Hornby, R.N., Knowsley Cottage, near Prescot, Lancaster, between Toulouse and English geese. Very good and handsome. 3rd prize, £2.

997 H. G. K. Breavington, of Vicarage Farm, Heston, near Hounslow, Middlesex, English double brooded geese. Three prime birds. Highly commended.

1003—1005 T. T. Parker, of Astley Hall, near Chorley, Lancaster, common geese. 1003 fine handsome birds; swan-like neck, large and long make: 2nd prize, £3. 1004 similar in character; not quite so large: 4th prize, £1. 1005 same in character, but larger and more noble birds: 1st prize, £5.

This is a very good class, and the birds, as a whole, a splendid lot.

AYLESBURY DUCKS.

CLASS XI.—DRAKE AND TWO DUCKS.

1007 J. Fairlie, of Cheveley Park, near Newmarket, Aylesbury duck. A very handsome lot.

1013 J. Weston, of Oxford Road, Aylesbury, Bucks, Aylesbury ducks. A very superior lot of birds; very large and profitable: never saw a finer lot or so handsome in form and appearance. 1st prize, £3.

1019 L. C. Stow, of Bredon, near Tewkesbury, Worcester, white Aylesbury ducks. A very handsome lot; too delicate for farm service. 2nd prize.

1022 J. Dutton, of Bury St. Edmonds, Suffolk, white Aylesbury ducks. Very large and fine ducks.

1026 A. Wilcox, of Nailsea Court, near Bristol, Aylesbury ducks. Beautiful, large, and good; truly white. 3rd prize.

A good class, and well competed for.

ROUEN DUCKS.

CLASS XII.—DRAKE AND TWO DUCKS.

1031 Capt. Hornsby, R.N., of Knowsley Cottage, near Preston, Lancashire, Rouen ducks. Very fine ducks; good and profitable. 3rd prize, £1.

1033 W. W. Rowe, of Longbrook, near Milton Abbott, Devon, Rouen ducks. Rather too delicate, but beautifully symmetrical. 2nd prize, £1.

1112 Three very handsome fine birds.

Very slight competition in this class.

DUCKS OF ANY OTHER BREED THAN AYLESBURY OR ROUEN.

CLASS XIII.—DRAKE AND TWO DUCKS.

1035 and 1036 H. S. Pigott, of Brockley Court, near Bristol, black Labrador ducks. 1035 small, pretty forms, but not profitable: 1st prize, £3. 1036 black, and singular looking; fair birds: 2nd prize, £2.

1038 H. Blandford, Sandridge, near Chippenham, Wilts, Lincoln ducks. Large and profitable sort.

1040 S. Buckle, of Moat House, Uckington, near Cheltenham, Gloucester, decoy ducks. Delicate white; very pretty. 3rd prize, £1.

Rather better competition, but great variety.

We have now passed over all the classes. We have as far as possible avoided casting any censure, our desire being simply to withhold commendation where it was not merited. In a few cases we have omitted the number altogether, but the omissions generally are those numbers not represented, the stock not being present.

In concluding this series of papers we have only to add, that we think a consecutive analysis annually given by competent parties of every class would be very acceptable to the agricultural public. For ourselves, we offer every apology for the very meagre and unsatisfactory account we have been able to render of the various classes. One individual cannot be expected to do common justice to them; we can only say we worked hard and unremittingly during the short time allowed us for inspection, and we must beg our readers to view with their utmost candour our remarks. Our desire is to benefit the society, and promote improvements in every department. We feel assured that in almost every case it is merely requisite to point out a defect or error to have it remedied. We have, we hope, done so sparingly and in a proper spirit; we shall feel sorry if we have given a moment's unnecessary pain, and we shall be deeply gratified if our remarks lead any of our readers to look about them, and determine in the true spirit of laudable rivalry to excel by the adoption of better breeds than they may have shown at this meeting.

LONDON FARMER'S CLUB.

It would have been difficult indeed to have selected a more becoming motto than that determined on by the Royal Agricultural Society of England for the title-page of their *Journal*—"Practice with Science." To such a theme must its pages be still continually devoted, as on such an union must we rely beyond all others for the further development of our own resources. There are few now but who are brought to admit this. It is but a just compliment to the working-farmers of this kingdom to record that we have no more hackneyed text-word than that we have just quoted. There is scarcely at present a branch in the pursuits of agriculture but to which the aid of science is made to apply. A man may not be able to farm without capital, without a lease, or without liberal covenants; it is equally certain that he will not be able to make the most of his business without the use of some scientific knowledge. He is expected to do something more than his fathers did, and science is the light that will lead him onwards.

It has been our fortune within the last few days to hear the merits of this "happy union" advocated, by gentlemen who may very fairly be ranked as the representatives of the two professions thus brought together. On the last day in October we made one of the audience assembled at the Botley Farmers' Club, to receive Mr. Nesbit, and his lecture on the connection between science and agriculture. On that day week, the first Monday in November, we found Mr. Baker, of Writtle, at the London Farmers' Club, about to open a discussion touching the influence of science upon agriculture. It may not be altogether out of place to mark how science, through the aid of her champion, Mr. Nesbit, was inclined to treat agriculture; or how agriculture, on the other hand, as represented by Mr. Baker, was ready to welcome the advances of science.

Mr. Nesbit, then, at the Botley meeting boldly threw down the gauntlet. In tracing the connection between agriculture and science, he placed the two almost in antagonism to each other. He was elaborate in defining the distinction between them; and hinted pretty freely that as the practical man was always ready enough to attack the theoretical, it was only fair to return the compliment. In furtherance of this he proceeded to show that for two hundred years practical agriculture—the *art*, as he finely distinguished it from the science—had done little or nothing. There was in fact scarcely a discovery or an improvement on which we might be now pluming ourselves, but would be found in a little work written by a Mr. Platt, more than two hundred years since. The use of artificial manures, of liquid manures, the process of steeping corn, of dibbling, of turning birds' dung or guano and horn shavings to the best account, of burning clays, and so forth—all these were distinctly mentioned in the work written by H. Platt, Esq., in 1601. The triumphant deduction gathered from this was, that the practical man had done little or nothing since then; and the compliment was as good-naturedly taken as it was given. The lecturer, however, did not appear to see that his logic might cut both ways, and that if the practical man had not been doing much, the scientific one had been doing but little more. Indeed, according to Mr. Nesbit's showing, nearly all we have been told lately about the use of manures, the virtues of guano, the benefit of irrigation, and so on, might all have been quietly borrowed from that hitherto but little known authority, "H. Platt, Esq."—for so is he written.

It is but right to say that no sooner had the lecturer at the Botley club dropped his ancient friend than we lost sight of that invidious comparison with which his work had been resuscitated. Mr. Nesbit then proceeded to those really valuable details, such as are reported in his visit to Driffield, that all tend to show how close and lasting must be the connection between agriculture and science. His opening, however, we must candidly repeat, struck us as a mistake. None ought to feel more than himself how politic it must be to cement the union between the two pursuits; while none, we are sure, have less reason to complain of the attacks which he assures us one *has* made upon the other.

At any rate, there was little evidence of this disposition to attack, when the practical man himself took up the subject. It is difficult to speak in terms too highly of the address in which Mr. Baker traced the influence of science upon agriculture. We scarcely know whether of the two to admire more—the good feeling which dictated his remarks, or the comprehensive ability that so strongly enforced them. Step by step, and path by path, did he demonstrate how "happy" indeed was that union the meeting became so ready to admit. From the most important to the most trifling operations in the business of the farm did he show how advantageous and how necessary must be the use of science. It is not our purpose here to analyze in any way the paper in which one of the founders of the Farmers'

Club so signally distinguished himself. We give it, with the discussion that followed, in another part of our Journal of this day; to which it is hardly necessary to further direct the attention of our readers. It will interest nearly all alike, though none, we believe, will study it with more pride than the practical farmers of this country.

Mr. Baker has himself long and worthily been identified with the practice of British husbandry. Often enough has he been reviled and ridiculed amongst that "old watchman sort," that could learn nothing and could do nothing. We turn with some satisfaction to the proof. We believe that none ever offered more legitimate aid to the union between science and practice, that none have weighed over the subject more soundly, or advocated it more ably. Mr. Nesbit says it has been the fashion to attack the man of science. He never heard, of course, of any attacks on the man of practice—the senseless abuse and ceaseless libels that have followed him. Let us by our closer union furnish the best answer to such as these; one, more of deeds than of words, that will teach us to heed still less him who attacks us on the way—the saucy cur whose strongest argument is his noisy tongue.

"THE INFLUENCE OF SCIENCE UPON AGRICULTURE IN ITS PROGRESSIVE STAGES FROM THE EARLIEST PERIOD TO THE PRESENT TIME."

The first monthly meeting for discussion, after the usual autumn vacation, was held, on Monday, November 7, at the Club House, Blackfriars, Mr. Trethewy in the chair.

The CHAIRMAN reminded the meeting that the subject on the card was, "The influence of science upon agriculture in its progressive stages from the earliest period to the present time"; and expressed his confidence that Mr. Baker, by whom it was to be introduced, would treat it in the manner in which so important a question ought to be dealt with.

Mr. BAKER said: In an attempt to address myself to the proposed question, the chief difficulty appears to be how to be able to comprise within the ordinary limits of a lecture the wide and important subject under consideration; for embracing, as it does, every department of science, it becomes the more difficult to select judiciously those points of greatest interest, and, in doing so, to combine them into a popular form, so as at once to exemplify and arrest the attention of the able and intelligent assembly I have the honour to address. If the subject chosen had been the "History and Progress of Agriculture," it would scarcely have presented a more extensive field for investigation; but as it is confined to the question as to "how far science has benefited or contributed to its advancement," I must be excused travelling over a period extending beyond that of the present century, as within that space of time ample matter will be presented for elucidation of the subject, and, at the same time, will be more beneficial in the examination. I shall, therefore, consider that geology and chemistry stand foremost; that mechanics, botany, entomology, and animal and vegetable physiology, are next important; and, in addition, that every department of science may be brought under investigation. In the early periods of the history of agriculture, and, indeed, up to that immediately preceding the one now proposed to your notice, the whole of the processes of agriculture were *merely practical*; and the facts that were deduced were such as forced themselves upon the notice of our forefathers by their utility; and, without examining how or why these effects were produced, it was only then the aim to apply the same means at a risk of securing the same object; and whenever the circumstances were similar, and the application identical, the result as surely followed as now that our investigation has taught us that the combining different substances in the same manner will inevitably produce the same results. The science of geology unfolds the hidden secrets of the earth; and the investigation that has been so closely and attentively pursued enables us to estimate the nature and disposition of the various strata upon which we may be destined to exert our skill; and to whatever extent anatomy may benefit the investigations of the pathology of our class, and advance the scientific acquirements of the medical student, so in degree will the knowledge of geology advance the knowledge of the cultivation of vegetables, and enable the various processes of draining and improvement of the soil to be successfully and advantageously carried out. The order, disposition, and composition of the various strata of which the earth is composed is in itself an interesting and entertaining subject; and that knowledge—when thoroughly applied to the spot immediately beneath our feet, and upon the surface of which we may be endeavouring to obtain the largest amount of produce—becomes at once an object of the greatest importance, and may be the means of directing the endeavours of the skilful cultivator to most important results; when, upon the other hand, the absence of such knowledge leaves him, as it were, to grope in the dark, without a scintillation of light to direct his endeavours. Such is the order and disposition of the various strata, that it requires no great extent of acquirement to be enabled to describe the succession in which they will be exhibited, supposing that we might be tempted to make the investigation by digging downwards several hundred feet for that purpose; and, further, it will enable us, as we proceed from a south-easterly to a north-westerly point across the kingdom, to tell with tolerable accuracy what will be the qualities of the soil we successively pass over; and having obtained the knowledge of one series of strata at one place, to tell what will succeed as we proceed onward from district to district, from one county to another, and from one extremity of the kingdom to the other. This, upon general principles, must be highly advantageous to the land-agent, whose occupation embraces a large and wide field for action, as well as to the cultivator who is seeking

the spot upon which he will for the remainder of his life be destined to exert his talent and labour; for Nature has so distributed her benefits, that they must be sought before they can be applied, and, when found, must be so combined as to render them effectual. If a person unacquainted with the science were desirous of information upon the nature of the soil upon which he intended to carry out any great improvement, he would never effectually do so until he had obtained the requisite information; take, for instance, the spot over which we are now standing, and upon digging downwards, a few feet of alluvial deposit, consisting of beds of loose gravel, loam, and sand, would be found resting upon a tenacious clay (forming as it does the centre of the London-clay formation), itself resting upon chalk, through which the water percolates from the higher level of the chalk districts of Cambridgeshire and Essex, as well at that of the Sussex Downs, forming beneath us an immense basin, and from which, by perforating the clay by boring through it, the water would rise, according to circumstances, within a few feet of, or might overflow the surface, as practised to so large an extent throughout the metropolis, and known as the "artesian process" of obtaining water. With this knowledge beforehand, we are enabled to calculate with certainty the possibility of obtaining water by such means; and throughout the greater part of the marshes of Essex, advantage has been taken of this process, and those districts which were formerly so unhealthy from the absence of good spring-water are in that respect rendered equally healthy with the surrounding uplands. Upon this clay, which extends from 50 to 100 miles around London, rests an intermediate loam, called the "white chalk clay," occupying a large proportion of Hertfordshire, Essex, and Suffolk, and forming the intermediate strata lying between the edge of the chalk and the London-clay formation; this loam (or clay, as it is called in the counties before-mentioned) abounds with chalk, or as marl, or in particles and small round pebble-shaped portions, evidently worn smooth by the action of water in admixture, and forming a subsoil from 20 to 80 feet in thickness for many miles together, with little variation, and well adapted for the production of wheat and barley, and other cereals. Now, as every good soil consists of a proper admixture of alumina (or clay), calcareous matter (as chalk), and silica (or sand), wherever the mixture is not complete, or the clay or sand is greatly in excess, the intermixture must be completed by mechanical process. Chalk may be added to clay, or the latter added to gravel, or sand; in fact, the three substances need to be combined in proper proportion to produce the utmost beneficial result. Now, as beds of the chalk are found alternating upon the surface of the London clay, and the latter is almost entirely surrounded by the chalk, or by the sea-coast, the utmost facility is given to enable the cultivator to produce the necessary admixture; but as the carriage of so ponderous a substance as chalk, or chalk loam, is a most important consideration, a thorough knowledge of geology is absolutely necessary to enable the cultivator to select a soil judiciously, as a field for his operations; and so of every portion of the kingdom, we may seek in vain for *chalk above the London clay;* and, on the other hand, we shall never find it *resting upon chalk* when we have fairly entered the chalk districts; and as a tenacious clay farm is almost valueless without an application of chalk or marl clay, or a loose gravelly subsoil without both, the information becomes especially important. I only mention this as one of the points of exemplification; for, doubtless, throughout the kingdom other combinations of the various soils are equally important; and as those soils will be found to exist under similar circumstances, the knowledge of this science is everywhere equally important: take, for instance, the beds of marl found a few feet below the siliceous deposits forming the upper stratum of Norfolk, and also of the clay existing below the peat formation of Lincolnshire. The combination of these is effected by raising the lower stratum to the upper, and thus by admixture in proper proportions rendering the districts that were notorious for their barrenness at once fertile and productive. One of the chief essentials of good farming is the proper admixture of soils before referred to. How essential, then, to know beforehand *what* admixture is necessary, and *how* it may be cheaply attained! A knowledge of geology teaches this, and so far is a science that has been highly beneficial to agriculture. In another point of view geology is highly necessary, and to that especially, more than any other, the science of draining is referrible. Whenever water is in excess in any subsoil, the crops upon the surface are retarded in their growth; and upon clay soils especially the cultivation is affected and the expense increased. To obviate this, drains beneath the surface have been constructed, and within a few years a more permanent system than that pursued by our forefathers has been adopted. When the nature of draining is considered, it is matter of astonishment that such great difference of opinion exists as to the best mode of accomplishing it; but the fact is that the practical department has been entered upon by persons who had not the slightest previous knowledge of the subject, and, like empiricism in medicine, where hydropathic and homœopathic systems assume a place, so we have deep and shallow drainers of all depths and distances, each applying his particular system to *every description of soil*, without reference to its tenacity, inclination, or disposition; and I may be allowed to say that a study of the science of geology is indispensable to its proper application. Nearly every description of subsoil is more or less stratified, or deposited in successive seams or beds resting upon each other, and all having a certain dip or inclination from the horizontal line, whereby the superabundant water they contain finds an exit; and whenever a porous soil, as loam, sand, gravel, &c., either separately or in admixture, rests upon a tenacious clay, the water sinks through the former until it is prevented sinking deeper by the latter; and the superstrata becoming overcharged, the water at length progresses in the direction of the incline until it arrives at the surface, (and at the spot where the clay rises to the surface,) and overflows the space lying at a lower lever; it is therefore evident, if a drain suffi-

ciently deep had been cut, in a direction across the field between the junction of the two descriptions of strata, that the whole space below would be drained of the superabundant water percolating through the porous soil; whereas a large number of drains in an opposite direction would not effect that object. It would be needless to pursue this subject further, as every one must acknowledge the great advantages that have been, and may be further derived, by the application of this department of science to agriculture, not only as it is applied to surface-draining, but to the draining of immense tracts of land, as pursued by Elkington in Ireland: nor can such works be undertaken successfully, unless a thorough knowledge of the science is first obtained. In another point of view, the application has been exceedingly beneficial to agriculture. It is upon a knowledge of the science that the quality of all soils may be ascertained. Those resting upon clay, upon chalk, upon sand-stone, or any other description of rock, have reference to that rock, as they must partake of it in admixture, as it has become abraded down from the earliest period of time; and as each description of soil is acted upon differently, organic or inorganic substances being thereby constituted into manures, it becomes apparent that a thorough investigation of the subject, combined with a knowledge of mineralogy, will be found at once beneficial and instructive. More might be added, but the time already bestowed upon this department exceeds the limits intended to have been given. The application of chemistry to agriculture may be said to be nearly new; for although Sir Humphrey Davy effected some useful discoveries, it was not until the writings of Liebig appeared that any general application of them were applied; and such is the extensive field it embraces, that it will be almost impossible to give an outline of its progress and application; but when it is considered that chemistry becomes applicable to the investigation, production, and analysis of every animal, vegetable, and mineral substance which may come under our notice, I think it will not be denied that a knowledge of it is more important than that of any other science; and although it might not be possible to define very many striking instances of its application, it is quite certain that it has been highly beneficial. The manufacture and production of manure is highly important to the farmer: by its aid a small portion of land may be rendered able to produce as much green or vegetable food as formerly was produced upon double the quantity; and by its further investigation and application, we have every reason to suppose that the production of a country may be increased in proportionate ratio with its population; and there is not the least doubt that it has already contributed largely to such a result; for, within a very recent period, the discovery of those chemical compounds called "artificial manures" is attributable to the application of this science. It had practically been known that the application of bones, in a broken or ground state, was highly beneficial to the production of turnips as bone-earth or phosphate of lime; but unless the bones were sufficiently reduced, the roots of the turnips to which they were applied could not take them up completely. But it occurred to Liebig, that if the bones were dissolved in sulphuric acid, they would become entirely reduced to a pulpy state, and therefore be rendered subservient to the purpose: an experiment was made, and found to fully answer the anticipations of the great mind that had propounded the question. Since then other natural substances have been found, and appropriated in large quantities; and the beds of coprolites, found imbedded in some of the strata of the earth, have contributed largely to the previous resources; so that now thousands of acres of cattle-food and green crops are annually produced by its application. The importation of guano, that took place at about the same time, gave a new impulse to agriculture, and the high price of this powerfully concentrated manure has led to great imposition on the part of fraudulent dealers: but chemistry has stepped in, and arrested their nefarious practices to such an extent, that the quality of that or any other ammoniacal manure can be accurately estimated, and its value calculated; and therefore an immense boon has been bestowed upon the agricultural interest. But independent of this power conceded to us, we have gained another equally important—the investigation by analysis of the component substances of every description of plants; and by ascertaining the proportions of the various elementary substances that enter into their composition, we are enabled to ascertain what description of manure or inorganic substance best suits their production, and by the application ensure a result that before was only problematical. The elementary substances of which our ordinary manures are compounded, together with the best modes of producing or fixing the qualities they possess, have become also of immense importance; and the waste, that formerly prevailed to a great extent, has become obviated. The principles of the science shew how those gaseous and evanescent properties may be accelerated or prevented; and it teaches us how all of them may be arrested, fixed, and converted to our use. The combination of substances, hitherto only practically understood, is now thoroughly comprehended: the experienced agriculturist is now enabled to give a reason *why* he makes any application to increase the productiveness of his soil. Lime, chalk, marl, and other inorganic substances, are not applied indiscriminately to all descriptions of soils as formerly, with only a chance of success: but knowing the properties of the soil to be improved beforehand, the application is now made with certainty of a successful result. To the grazier it is not less important. The constituent properties of every description of cattle-food may be ascertained, and their values calculated and compared; and therefore the application of those substances for the production of meat may have their nutritious qualities as accurately defined and estimated as any other calculation of less abstruse character; and therefore we are enabled in a better manner to apply the different varieties of grain and vegetables with greater advantage in the production of animal food, either in the form of muscle or fat; some descriptions of grain-seeds and vegetables having a tendency to pro-

duce muscle, whilst others as certainly tend to produce fat. The oily seeds, and their mucilaginous refuse after manufacture, being largely used for the production of meat, can now have their respective values accurately calculated in comparison with those contained in grain having nitrogenous properties as their basis, or those contained in vegetables of which sugar is the component substance, mixed with various proportions of matter of which vegetables are composed. To take a comprehensive view of the subject, we are debarred by the extent to which we are limited; and, even to take a condensed one, would occupy much time; and in quitting this department of the subject, it only needs to be remarked, that of all the sciences, chemistry is the noblest, most entertaining, and useful. The benefits resulting from it have led us to partake of the blessings of Providence in its widest sense; and the field for investigation is still so extensive and unexplored, that advantages still greater than at present have been obtained for agriculture are yet to be discovered and applied; and as this subject has been lately so fully entered into by a talented member of our club (Mr. Nesbit), I can only conclude my remarks by recommending a perusal of his excellent lecture, delivered to the members of the Driffield Farmers' Club. I will now enter upon a new branch of the subject upon which I am treating—that of Mechanics; and although it is put down in the card that I should exhibit the influence of science upon agriculture in its progressive stages to the present time, it is my intention to pass over all that portion applicable to agriculture previous to the commencement of the present century. It will not be out of place to compare the rude implements of the past with those of the present age—to contrast the "miry ways," described by Tusser, in the sixteenth century, with the well-constructed roads and railways of the present period, by the application of which the cost of cultivation, an cartage of manure and produce, have been reduced fully 50 per cent., independent of the comfort and advantage derived in a pecuniary view. And when it is considered that the manure for an acre of turnips of 20 tons weight can be produced upon most farms for 30s., inclusive of carriage, in the present day, when, at the period alluded to, the cartage of the manures alone sufficient for that purpose would in most instances have amounted to a larger sum, the advantage thus derived cannot be too highly valued and appreciated. Again, compare the rude ploughs and implements of that period with our modern inventions; and the comparison is so astonishing, as to outrun the most vivid imagination. Take, for instance, the drill machines, the cultivators and scarifiers, ploughs, crushers, rollers, horse-hoes, thrashing mills (both of steam and horse-power), reaping machines, and turnip and chaff-cutters, and all the elaborate list of machinery, and it is cause of astonishment and surprise. The ploughs, harrows, waggons and carts, and rollers of our forefathers, comprised nearly all their working *materiel*; but the accumulation of implements upon well and highly-cultivated farms now runs into the other extreme; for, I may be allowed to say, that a well-chosen selection will be found more beneficial than the most extensive accumulation of all the varieties that fill our agricultural exhibitions; and in awarding prizes, it is to be lamented that those of practical utility are frequently passed by, and prizes frequently awarded to articles of show and intricate manufacture in preference. It is equally impossible at this juncture to tell or even to comprehend the advantages still to be derived to agriculture by mechanical power, especially that of steam; and a new theory is becoming established, that even the plough itself may become superseded by machines that will tear up or dig the soil, and pulverize it by the same operation, entirely by the application of steam-power—as it was half a century since to imagine that grain might be thrashed by horse-power. In fact, all the operations of husbandry that require considerable motive power, may be accomplished by the application of steam, and thus the increased cost of manual labour and the reduced price of grain be compensated. That agriculture has derived great and extensive benefit by the application of machinery cannot be denied; indeed, such have been the advantages derived, that probably there is no previous instance of men of talent and invention having dedicated themselves entirely to the producing machinery which, for complication, applicability, and utility, exceeds our most sanguine anticipations. The production of bread and meat ought to be viewed as any other manufacture—the better, more largely, and cheaper we can produce it, the less of our capital will be yearly absorbed, and the progress of the nation to wealth and power will be more speedily and more easily obtained. In political economy, cheapness of provisions is the basis of national prosperity, provided that cheapness arises mainly by the facilities by which we as a nation are enabled to produce them. Take, for instance, the rise in the value that has lately taken place in grain, and answer the question of Who is benefited? Not the producer, for he finds that the deficiency in quantity is barely compensated by price; whilst, on the other hand, upon a consumption of 24,000,000 of quarters of wheat an advance of nearly 40 per cent. has taken place, which, added to the increased value of other grain, is more than the whole amount raised by annual taxation. Shall we consider it a blessing, after taxing the springs of industry with £50,000,000, to have a second infliction of like amount imposed upon us, beyond that which will find its way into the hands of foreign producers, who have no sympathy for us beyond that of our being their best customers? I will not pursue a subject that may be considered of political character, but I cannot allow the opportunity to pass without observing that not only would agriculture, but every department of industry in this kingdom be benefited, if a complete system of statistics were obtained; and having on several occasions alluded to the subject, I am happy to find that not only has my proposition been adopted, but the mode I suggested of effecting that desirable object through the instrumentality of the various Boards of Guardians, been put into operation, by direction of Government, in the county of Norfolk. Farmers are not the parties benefitted, but the consumers; and therefore the cost should be defrayed by the Government, and not thrown upon the land.

The science of Botany has doubtless its share in the pursuit of agriculture, and has pointed out that distinctive classification of plants and vegetables as enables us better to comprehend not only the nature of soils from their spontaneous production, but how to improve those that are beneficial, and eradicate those that are injurious, by the application of extraneous substances derived from the spot or surrounding district, and by combining them produce effects that otherwise could not be obtained but by application of capital to an enormous amount. The cultivator is now, by the assistance of this science, combined with a knowledge of soils, enabled to understand how far he can improve that with which he is brought into immediate contact; and not only to understand, but so as to be enabled to effect a change that will enable him to double the amount of his produce. The presence of obnoxious weeds indicates the nature of the soil upon which they grow, and at the same time teaches us what other soil may be applicable by way of admixture, so as not only to correct the tendency of the soil under improvement to grow weeds, but at the same time double its produce of what is beneficial. Take, for example, the application of carbonate of lime (as chalk, marl, &c.) to soils requiring their application. It will be found that the common poppy, corn marigold, sorrel, May weed, white charlock, and various others, become eradicated by its application; and that, therefore, the presence of those plants indicates the value of them as a means of improvement. But, independent of these advantages, a knowledge of the physiology of plants, and their classification, will assist us in improving the different varieties by cultivation and inoculation; and thus on the one hand by selecting, and on the other by hybridizing, we are enabled to attain that degree of perfection in the quality of our productions, especially that of roots, of which our forefathers were totally unacquainted. Doubtless numerous losses are yearly inflicted upon the agriculturist, from the vendors of seed not taking the necessary care to keep the different varieties distinct, especially those of the brassica tribe. It is not unusual with seed growers to have many varieties of seed growing in the same field, or within a short distance, all of the same order: cabbages of every description, brocoli, Swede turnip, rape, kohl rabi, &c., each deteriorating the other, until at last the whole are sent out upon their mission to inflict injury and disappointment upon the growers. The knowledge of this science will not only teach him to avoid such mistakes, but, on the other hand, encourage every producer to grow his own seeds to an extent more than equal to his requirements upon distant portions, and otherwise vacant corners of his farm. The knowledge that the growth of plants is regulated by certain laws, and that they deprive the soil of nourishment beneficial to their own class, and at the same time deposit substances beneficial to plants of another class, is also of the highest importance to the agriculturist. Upon this knowledge are based the principles of good and systematic cultivation. The cereal crops, as wheat, barley, and oats, succeed well after the legume or trifolium classes, and supply deposits that become again suitable to their production: perhaps wheat, for instance, cannot be so successfully produced as when it follows the common red or broad clover (*Trifolium pratense*), or the bean crops—both distinct orders; but if sown after rye-grass, apparently so different from itself, it more ill succeeds than upon any other rotation. The botanist knows that the rye-grass is a plant of the same order, and therefore has a previous knowledge that it would be equally prudent to sow wheat after wheat, as to sow wheat directly after rye-grass alone. The diseases of plants are traceable to causes that may frequently be prevented by pursuing a rational system of cultivation. The fingers-and-toes in turnips, the smut and pepper-brand in wheat, the mildew in peas, and other vegetables, all have reference to this science. The whole class of parasites are peculiar in their mode of attack, and generally attend previous disease of the plant, especially from drought or other external causes. The mildew in wheat may, to a certain extent, be provided against by previously judicious cultivation. The smut in the same plant may be entirely prevented by subjecting the seed-wheat to preparations of vitriol, arsenic, and other agents sufficientiy strong to destroy their vegetative quality without injury to the grain itself. The application of sulphur to the leaves and fruit of the grape entirely destroys the fungus, which has of late produced such disastrous effects both in this country and abroad. The filamentous matter by which fungi propagate may be arrested by applications of corrosive sublimate in solution; and by its application, and introducing a free admission of air, dry-rot can be entirely prevented or arrested; and it it only within a few weeks past that I have endeavoured to direct public attention to the probability of the spores of the particular parasite *Botrytis infestans*, that attends upon the disease of potatoes, being analagous in their propagation to those of the smut-ball in wheat; and as the spores of the latter are taken up by the plant during vegetation, and continued from year to year, so, as with the smut-ball, they may be arrested by submitting the potato intended to be planted to the action of some solution not sufficient to destroy their vitality, but still, as with the smut-ball, sufficiently strong to prevent their further vegetation. Entomology is a science having distinct reference to agriculture. At every point the labours of the agriculturist are arrested by the destructive effects of one class or the other of the various insects that infest the farm, either in their larvæ state or as completely formed. Some of them are astonishingly destructive: perhaps no one description is more so than the larvæ of the *Elator lineatus*, or Click beetle, known to the cultivator as the wire-worm. These insects, it is known, are peculiarly destructive to the varieties of young corn and grasses, which it destroys by eating through their shoots beneath the ground. It has been ascertained that the eggs by which it is produced are deposited by the beetle in the preceding summer, and that it selects decaying vegetable substances, especially tufts of decomposing grass and rye-grass, for the purpose. Although we cannot easily prevent its ravages when it is once fairly established, still we can arrest it in the early stages of cultivation by eating down the grass layers close with sheep; by paring

and turning the surface; but more especially by quickly ploughing the land after each grain crop is removed, and preventing an accumulation of grass: by a close attention to this subject, little fear need be entertained as to the result. If the oats succeeding a grass layer are drilled with from two to three cwt. of guano per acre, it is said their devastations will be prevented; or, by drilling-in rape-cake, upon its being ascertained that they have commenced their destructive efforts, they will leave their natural food to prey upon it, which it is supposed they do so voraciously as to be destroyed by it. The common slug is another destructive pest; but against its ravages fresh-slaked lime is a preventive, if sown early whilst they are found upon the surface. Some insects exist in the larvæ state for one, two, three, or four years, especially the well-known beetle, the cock-chafer. The whole genus of the aphis, that prey upon our pea and bean crops, are the food of small birds, particularly sparrows, which to some extent compensates the immense injury they otherwise inflict upon us; whilst the larvæ of the beetle before described are equally attractive to the rook. But in these cases we only maintain one description of enemy for the purpose of destroying another: both the birds referred to are great pests, and annually destroy a vast amount of food and seeds. The finches, if unobstructed, would also entirely destroy our seeds of turnips and cabbages, as well as rape. It is obvious, therefore, under the improved system of cultivation and production, that insects are not produced in such numbers as formerly; and it is an ascertained fact that we can get on without the assistance of birds better than with them in such numbers as frequently, by the whims and caprice of individuals, become inflicted upon us. The science of Meteorology has not at present far advanced our position, but a general acquaintance with its principles is essential; for although we cannot foretell the weather with accuracy, we can, by an investigation of the subject, obtain data upon which to base our observations; and the scientific farmer may derive much information that will enable him, with tolerable accuracy, to foretell the weather for a short time beforehand, and which will frequently afford him advantages that his less intelligent neighbours do not attain. The law of storms, as propounded by Captain Reid, is also opening a new channel of information, and we hope ere long to arrive at fixed data that will determine the phenomena of the atmosphere; but, as I recently devoted a discussion upon the subject, I shall now cease further allusion to it. The application of buildings to the purposes of agriculture, suitable and substantial, is another point that we cannot pass over. And, under the head of architecture and the erection of buildings, we know that information has been carried out to an extent that few are willing to concede; but as warmth to cattle is found essential to their quickly fattening, and "economy of food" is also an important consideration; whilst though last, not least, the manufacture of manure is most important, it has led men of practice to apply their talent in various ways to insure those objects; and whether it is effected by covered homestalls, well-arranged and constructed sheds and buildings, or by confining animals to a separate box or stall, matters little. Each and all of them are a vast improvement upon the old system of throwing turnips over a dirty field, and turning out cows and neat stock to feed upon them in a half-rotten state during the severity of our winter months; and the knowledge that chemistry gives us upon this subject, as well as a knowledge of the theory of heat, when properly directed, enables the investigator to direct the means to the end, and to obtain a far larger quantity of meat from a given quantity of food than formerly. This applies not only to the management of neat stock, but also of sheep and swine. The former now are fed in sheltered yards, or have the roots cut into slices and disposed in troughs, to be eaten with a degree of comfort unknown at the time when every sheep had to scoop its food from solid turnips half imbedded in the soil, and the remains of which bore evidence of the difficulty of obtaining their food, by the blood from their gums being spread over the surrounding food. The steaming and boiling food for swine enables a profit to be obtained by feeding that animal, which, on the contrary, with the same description of food fed out on the old plan, would as certainly produce a loss. The management of farm-horses, also, may be reduced to scientific principles. The cutting, crushing, steaming, and preparing the food economises it at least 20 per cent.; and the horses are less liable to have their health deranged. The keeping them in open well-sheltered yards has superseded the close confined stables, where, night after night, and even for days together, cart-horses remained tied by the head, and pampered and fed in the most injudicious manner. By cutting the food of horses, and foddering them in yards, a large quantity of manure can be annually made; and the green food economized, and by the mixing the green with the dry food early in the spring and autumn, the ill effects of the transition from one to the other is avoided. The introduction of guano and other manufactured portable manures may also be said to have produced a revolution in the farming process, especially of that description of light land called *turnip land;* upon the clay and loam soils the finest Swede turnips, mangold wurzel, cabbages, and rape, are produced with the utmost success in every situation where the farmer has sufficient spirit and capital to follow it up properly. So that winter food may now be produced almost without limit, and in situations where no such resources could before be obtained. The system of road making, and its application, has become also of immense advantage to the carrying out the details of farming. The system of irrigation as now pursued in districts suitable for the construction of water meadows is also of immense advantage; indeed, on whichever side we look, and to whatever extent we investigate, a wide and extensive plain presents itself, which seems to expand as we proceed, and draws us on in the path of progress without the slightest probability of ever being enabled to reach the end. And how can it be otherwise, in a pursuit that is dependent more or less upon every science or department of knowledge within our reach? a pursuit that is never the same in two

different places, and therefore requires a varied mode of application to attain an object in almost every case, as the circumstances under which any application is made can never be the same; and, therefore, in no other pursuit is the judgment of the manager called more into operation. An agriculturist ought, indeed, to be endowed with a knowledge of every science to a greater or less extent, to become perfect in his profession; and, in addition, a long practical application will also be necessary before he can attain perfection. But, fortunately, as in every other department, men are found endowed in an especial manner to qualify them for one pursuit; and when such is to them the all-in-all of their existence, they generally succeed in an astonishing manner. In the earliest period of farming history, the earliest writer upon the subject was Thomas Tusser, a native of Rivenhall, in Essex: in quaint quartain verse he reduced the first principles of farming to rhyme; and most of the adages and proverbial expressions found in later writers originated with him. The collection published by Franklin in "Poor Richard's Almanack" are nearly all derived from Tusser: but in a quaint emblem published after his death by Quarles, in which a scythe and whetstone appear, are several verses, showing that what a whetstone is to a scythe, such was Tusser to other farmers' minds. Though blunt himself, he sharpened other men's wit; and though a rolling stone that gathered no moss, he taught thrift and good management to others. In fact, he was more, for the time, learned than practical; and as it is said a love of money and a love of literature never exist together, so it is feared that many of our best practical writers upon farming are not the best managers of their farms. This is said to apply especially to the late Arthur Young, who explored the kingdom, and described the process of farming in its various departments in a manner that did him infinite credit. It is in some minds to obtain knowledge and retain it; and rarely does it happen that the power of obtaining knowledge and giving it back again falls to the lot of the same individual. But in the present age, by the assistance of the press, we are enabled to circulate our ideas throughout the kingdom; and if every one brings his store of knowledge to the common fund, an astonishing amount of information will be yearly derived. The assistance rendered by the *Journal* of the Royal Agricultural Society has been of immense advantage; and it is to be regretted that so many valuable papers that are sent there for competition, though unsuccessful as regards the prize offered, are not allowed to be printed. It might perhaps be invidious to do so, as possibly the public might not conclude the merit to be due to the person obtaining the prize, and thus the judgment of those making the award might be questioned; but still there is, no doubt, much agricultural information lost to the public merely from this circumstance. The periodicals and newspapers devoted to farming have especially assisted its development, and might still be attended with advantage. Farmers, it is true, are not considered a reading class, but it has been gaining ground; and, in spite of themselves, they will become so, as the pursuit becomes more and more scientific, and which must inevitably be the case the farther we proceed in improvement (loud and prolonged applause).

Mr. Acton said, after the very excellent lecture of Mr. Baker, he addressed the meeting with great diffidence. The rights and interests of land are so intimately connected with those of trade and commerce, that one cannot prosper without materially affecting the other. When Mr. Baker framed this subject, and submitted it to the committee for discussion, we were indebted to Divine Providence for abundant harvests and low prices; now, when we are discussing the subject, prices are such as will admit of certain experiments in the science, with the view of improving the quantity and quality of produce, as a means of providing for an increasing population. We all must admit that the influence of science on agriculture is very great, not only in the economy of farming, but in the still further improvements, either temporary or permanent, embracing amongst other improvements, "Agricultural Statistics" ("Question"—"question"). Mr. Acton said, he mentioned the subject of Agricultural Statistics to elicit the views of the club on the subject; but, as the Chairman had interfered, he would proceed to other topics; but the members must recollect, that if they did not assist the Government in their collection, they could not expect the Government to assist them by Legislative enactment. As prices and profits were the great object and ambition of farmers, now, he contended, was the time to try these experiments in science; and he hoped by such measures to increase the quantity and quality of food, which was now rising to a serious price, to the great detriment of the labourer and the community at large.

Mr. J. C. Nesbit said the subject had been so well handled by Mr. Baker, that he had very little to add. What he had risen to do was, to offer a few observations as to the nature of practice and the nature of science. Practice consisted in the reiteration of processes which had been handed down from generation to generation, and the adoption and use of any additional processes which might have been discovered haphazard in the ordinary course of procedure. On the other hand, science was the work of an investigating mind—a mind which endeavoured to find out the reasons of processes in previous use, and from those reasons endeavoured to discover other modes of operation which might be more beneficial than the existing ones. It was only since science, or the scientific mind, had been brought to bear upon agriculture, that is, only within the last century, that there had been any considerable advance in agricultural improvement. By reference to Tusser's work, and others of the same period, it would be easy to show that many facts, not even now known to farmers in some districts, were well-known to some persons two or three hundred years ago. That since that period there had been great improvement in agriculture no one could for a moment doubt; but up to 1800 there was not a very large discovery of new facts, but merely an extension of the knowledge which, to a considerable extent, existed at the period to which he had referred. It was not until the commencement of this century that Sir Humphrey Davy began to direct his attention to the subject. More recently Liebig, having directed his attention to the same object, put forth a theory which, whether right or wrong, connected the general processes of farming together; and it was since that was done that there had been the greatest improvement, in the practice of agriculture. There had, in

fact, been a general development, extending to almost every department, since scientific men directed their attention to the subject. In using the phrase "scientific men," he had no intention of limiting the term, or applying it only to chemists who were engaged in the analysis of soils or manures. The scientific mind was a mind which inquired into the nature and causes of all existing phenomena, and, as applied to farming, endeavoured to investigate the processes that were most likely to conduce to the perfection of agriculture. Within the last ten or fifteen years great attention had been paid to the nature of the practical operations of the farmer, and science had been engaged in searching out the resources why certain processes led to certain results. For example, there was the feeding of stock. Farmers gave animals all kinds of food, linseed or cakes, mangel wurzel, hay, straw, &c. A merely practical man could not say what it was in any one of these descriptions of food that constituted the material most valuable for the animal. How did the scientific man discover it? He analyzed the constituent parts of the animal; the muscle, the bone, the sinews, the fat, the hair, the skin. He found certain constituents in these. He analyzed the food also, and he found certain constituents in that, in quantities varying in different kinds of food. He then asked the farmer which kind of food he had in his practice found best, which the next best, and so on; he thus ascertained the main ingredients of food, and, comparing the constituents in the food with the constituents in the animal, he arrived at the conclusion that the constituents most valuable in the animal was most to be prized in the food, and were contained in largest quantity in those kinds of food generally most esteemed by the farmer. He would make a practical application of this. At the present time farmers were buying oilcake at various prices. Different samples of oilcake contained different amounts of flesh-making qualities. How was the practical man to judge of the value of any particular samples of oilcake which were offered to him? He could not tell from the effect on the animal, as he had not yet tried it. By going with it to a chemist he might ascertain the amount of oleaginous matter, and of the albuminous or flesh-making principles, and also learn whether or not it was adulterated with other materials; and thus he might be enabled to save a considerable sum of money. He had known oil-cakes varying 30s. a ton in market price, yet of equal value to the farmer. Again, with regard to artificial manure, the farmer found by experience that dung made from oil-cake was better than dung made merely from straw; but it was only by the aid of the chemist that he could tell what ingredients were present in any particular manure. Of all men, farmers ought to be most intimately acquainted with science, because they were the most dependent upon such knowledge. In the soil which grew their crops, in the air above, in the earth and water beneath, in all around them, were to be found those substances which gave nutriment to their plants, and upon a knowledge of which depended their highest success. He hoped that a bright future was opening on agriculture. At present, however, the scientific man was so widely separated from the farmer, that no knowledge of farming could be got by the scientific man without a considerable expenditure of money; and without that knowledge he could give the farmer little assistance. A great deal remained to be done in the way of education, in order that the scientific and the practical might not be so widely severed; and he hoped soon to see a period when the youth of the agricultural interest would be so educated that the scientific and the practical would be united to a great extent in the same person (Hear, hear). Nearly all the great discoveries of agriculture were results of scientific knowledge. It never entered into the mind of a practical man—it was Liebig to whom it occurred that bones might be rendered more useful by being subjected to solution in acid; and he was convinced that if, instead of being, as some were, rather jealous of scientific men, practical men would unite with them, and the two would go on together as friends and brethren, that the most beneficial results would inevitably ensue from their co-operation (cheers).

Mr. THOMAS said, having seen on the card the subject of that night's discussion, he long ago made up his mind to be present, not only because he was anxious to pay a tribute of respect to one of the oldest and ablest members of the club, but because he took a deep interest in the question which had been so ably elucidated. Of the gratification which he had expected to receive that evening he had not been disappointed (cheers). In tracing the influence which science had had upon agriculture from the earliest times, Mr. Baker had been eminently successful, though he had omitted to mention some of the names upon whom fame shed its lustre. He began by telling them of Tusser, a man far before his time, who emerged from the gross darkness in which farming was then involved. He omitted to mention the name of one who followed not long after, and to whom they were indebted for the drill husbandry of England—he meant the celebrated Jethro Tull (Hear, hear). Again, while he paid a just tribute to the memory of Arthur Young, he forgot to mention that friend of agriculture, the late Sir John Sinclair—a man who, though not a theoretical or scientific person, yet succeeded in advancing the science of agriculture in a most extraordinary manner (Hear, hear). It was not, he believed, till the commencement of this century that science, as applied to agriculture, made any real progress. Honour be to the man who aided its advance! The humblest mechanic who made any improvement in a plough, harrow, or steam-engine, had done more good for the agriculture of the country than the crude absurdities of parties who had rushed into agricultural business without any previous knowledge, and who had thought proper to stigmatise those who had passed half a century in it as little better than idiots or fools (Hear, and cheers). He must remind them that, if they wished to have better agriculturists or more scientific men in the occupation of the land, they must look out for rather different men from many of the humbler members of the class to which he belonged (Hear, hear). It was scarcely to be supposed that the occupier of 100 acres could afford to give a scientific education to his sons. It was one of the charges brought against them, as a body, by the orators of the late Anti-Corn-Law League, that they had no education, that they were perfect ignoramuses (laughter), that they were nothing better than chaw-bacons and bull-calves, scarcely elevated, mentally, above Russian boors (laughter); whereas at the present day, if they endeavoured to give that education to their children which they considered to be necessary, they were told by the same parties that they were bringing up their children above the station in which Providence had placed them (Hear, hear). In order that a proper education might be given, it was necessary to increase the range of occu-

pation (Hear, hear). If science was to be brought to bear upon agriculture, the farmer must have the means of accomplishing that object (Hear, hear). In many parts of England the occupations did not exceed from 100 to 150 acres. It was evident that farmers, with such an occupation, could not afford to give their children a scientific education; they must therefore, he repeated, look out for a different class of persons. These must be men of large means; and then, and not till then, could what Mr. Nesbit recommended be attained Still they all knew how much time was necessarily taken up, practically, in the general routine of the farm (Hear, hear); and however much the farmer might at intervals resort to his laboratory, he was persuaded that, generally speaking, the chemist and the farmer ought to be different persons; and they ought to act in unison, but not to be amalgamated, as it were, in the same individual (Hear, hear). In practice, it would be found that the man who was called a chemical farmer, and who neglected his land, his flocks, and his herds, to retire to his laboratory, in ninety-nine cases out of a hundred came to ruin (Hear, hear). He repeated, therefore, that though he would connect the two, he would not unite them in the same individual (Hear, hear). Though science and practice should go hand in hand, it was not indispensable that they should be blended in the same person. With regard to an observation of Mr. Acton, as to the large profits which farmers were making with wheat at 10s. per bushel, he begged to tell him that 10s. per bushel this year would not bring him near so much as 5s. per bushel last year with the same acreage (Hear, hear).

Mr. W. BENNETT said that while he was perfectly ready to bear testimony to the masterly manner in which Mr. Baker had treated the subject, there were one or two of his remarks which appeared to him to require a little qualification. For example, he said that for an expenditure of 30s. for artificial dressing, 20 tons of turnips might almost invariably be produced. If Mr. Baker meant in the absence of all manure, the statement was a rather wide one. Again, he could not entirely concur in the remarks made with regard to the growth of wheat after rye-grass. He happened to have seen wheat of the finest description grown after rye-grass. He admitted that generally wheat did not succeed well after rye-grass; but he recollected that in the year in which he first went to Cambridge, Mr. Pemberton, the lawyer, showed him a crop of wheat following rye-grass, which was very strong in the straw, and which yielded not less than five or six quarters per acre. He (Mr. Bennett) had himself this year a field of 12 acres, the common Spalding red wheat grown after Italian rye-grass, which was the admiration of the neighbourhood. He did not, indeed, attribute the result to the rye-grass (Hear, hear). The land was in good condition, everything had been done for it; but the result was that there was from a quarter to a quarter and a-half more on that land than on any other. While he admitted it to be desirable to unite science with practice as far as possible, he must say that if the practical farmer did not know why he obtained a certain crop, yet he had one important thing to turn to for guidance, namely, his own experience (Hear, hear). He knew, for example, that where there had been a fair crop of red clover, there was likely to be a good crop of wheat (Hear, hear). He could not tell, perhaps, what was in the land; but he knew that such and such results followed certain processes of farming (Hear, hear). Mr. Nesbit had made some remarks with regard to the quality of different kinds of food. The farmer did not know, perhaps, how to analyze food, but he knew from long experience what food was generally the best; and, though he admitted that great advantages might be derived from the aid of the chemist, yet he must say it was most important to adhere to principles the soundness of which had been tested again and again, and to be guided by results which they knew to follow a certain course of practice. He had felt great pleasure in listening to the remarks of Mr. Thomas, who always spoke to the purpose (Hear, hear). There was, however, one point, on which he differed from him. Mr. Thomas seemed to think, that if science and machinery and skill were carried out to the fullest extent, the little farmers must go down. He (Mr. Bennett) was fully aware that the occupiers of broad acres had a great advantage over the small cultivator with respect to the application of machinery. Yet he confessed it was a state of things which he did not like to see—it was a state of things which, in his opinion, was likely to be mischievous to the country—that a class of men who had always been useful, always good members of society, should have to go to the wall. He thought it would be found, however, that they could take advantage of what was going on (Hear, hear). He thought that a great many of them, if they could not carry out improvement on a large scale, could do so on a small one; and he really did hope that men with 100 or 150 acres would not be sacrificed (Hear, hear). In his concluding remarks, Mr. Baker spoke of the difficulties with which the farmer had lately to contend in the cultivation of the soil—the various obstacles which had impeded the application of his skill and industry. The events and experience of the past year showed that, however they might do their best, they were still more dependent on an all-wise Providence than they were sometimes disposed to think (Hear, hear). While it was their duty to do all that they could to improve the art of agriculture, it must never be forgotten how dependent they were upon Him who ruled above, for success of every undertaking. Gentlemen who had differed from him might learn that, when they fancied that they had got to the goal of cheapness, a little change, a blast from the hand of Him who ruled all things aright, could disappoint all their expectations, and they might find, with all the benefits of free trade, a very dear loaf.

Mr. SIDNEY said they all appeared to feel that great attention should be paid to science. The only question was, how agriculture was to derive the greatest benefit from science—whether by scientific men applying themselves to the study of it in a separate department, and affording assistance to farmers as it might be required, or by farmers themselves becoming scientific. What was most desirable, in his judgment, at the present time, was that good education should be carried as much as possible to the doors of farmers. The education of this country was exceedingly deficient as compared with that of the United States and Switzerland; and if superior instruction were afforded in our village schools, the advantage to the farmers of this country would be immense.

Mr. BRADSHAW wished to make one or two observations with regard to the growth of wheat after Italian rye-grass. His observation had been particularly directed to that subject for the last eight years, in consequence of some of his relatives being great growers of Italian rye-grass. The evil to be avoided was the allowing the grass to run to seed. (Hear, hear). It ought to be fed off early in the spring; there was no crop which would bear so much feeding off, and everything depended on attention to that point. (Hear, hear).

Mr. BAKER replied: With regard to his observations in re

ference to the growth of wheat after rye-grass, he still adhered, he said, to the opinion which he had expressed. It might succeed in certain cases; but, on the whole, he considered the practice not good. He conceded to Mr. Bradshaw that the feeding down of the grass would make a difference. Italian rye-grass being peculiarly succulent, should be fed down more closely than other kinds of grass. But the cultivation of wheat after rye-grass on heavy clay-land was almost always attended with a bad result; and he ventured to say that any heavy clay-land farmer who adopted that mode of cultivation would not succeed. (Hear, hear). Reference had been made to Jethro Tull in connection with the subject of drilling. Tull did not succeed because like many other discoverers he went too far. (Hear, hear). He endeavoured to do away with the use of manure, supposing it to be unnecessary; and the result showed that he was mistaken. As to the remark of Mr. Thomas, that the application of science to agriculture must have a tendency to eradicate the small farmer—a result which he must say he, for one, should be very sorry to witness —(cheers)—he did not concur in that view. Men often succeeded better through the example of their neighbours than from any other cause (Hear, hear), and the lessons afforded by a good cultivator tended to the improvement of a whole district. (Hear, hear). However much they might deplore the fact that education had not been carried out to the extent that could be desired, still there could be no doubt that in the last ten years the cultivation of the land had generally improved—improved to a much greater extent than it did for a very long period before. (Hear, hear). Mr. Bennett did not appear to concur in his remarks as to the comparative effects of carting ordinary manure to produce 20 tons of turnips and expending 30s. on artificial manure. He still held the opinion which he had expressed on that point. If it were possible to grow 20 tons of turnips by the application of 20 loads of farm-yard manure, the same result might, he contended, be produced by the application of 3 cwt. of guano.

In reply to a question,

Mr. BAKER said he sowed his guano broadcast, incorporating it with the soil by means of a shallow ploughing.

Mr. W. F. HOBBS moved the following resolution:—

"That the influence of science upon agriculture has been greatly to increase the productive powers of the soil, and that during the present century rapid strides have taken place by the aid of chemistry, geology, mechanics, and other sciences.

"That it is the opinion of this meeting, that by the extension of scientific knowledge and the happy union of practice with science, still greater results may yet be accomplished."

Mr. CHEFFINS seconded the resolution, which was agreed to.

Mr. TATTERSALL moved a vote of thanks to Mr. Baker, who, he said, combined in himself the motto of the Agricultural Society—"Practice with science." (Hear, hear). He knew no gentleman who was better able to expatiate on the practical parts of agriculture; while as regarded the scientific parts, he could clearly explain many things which to the majority of them, at least to himself, were very difficult to comprehend. He was certainly well entitled to the thanks of the club for the manner in which he had introduced the subject." (Hear, hear).

The motion was seconded by Mr. Bennett, and cordially agreed to.

Mr. BAKER briefly returned thanks.

On the motion of Mr. Nesbit, a vote of thanks was given to the Chairman, and this terminated the proceedings.

THE STORING AND THE PRESERVATION OF SWEEDISH TURNIP.

Having so recently given my views relative to the storing and preservation of the mangold wurzel crop, it may appear superfluous to give a similar account relative to the Swedish turnip crop; for, although the mode of taking up and storing may be effected in precisely the same manner, there is a marked distinction in the care required to insure its preservation, and it is to this point that I particularly wish to draw the attention of the cultivators, as a subject of great importance in business.

The Swedish turnip is very liable to putrefaction in the grave: it is far more susceptible of injury, in this respect, than the mangold wurzel: it cannot be preserved under close covering—it must have sufficient air or ventilation. The loss annually accruing from improper storing is immense, as the most superficial observer may notice, in passing over the country. This mainly arises from the imperfect knowledge we possess of the precise nature or constituents of the bulb itself; for, did we study this more, we should be better qualified to judge as to the course to be pursued, to preserve it in its entirety. From common observation, however, we know that it rapidly generates heat when thrown together in heaps; that it speedily vegetates in the grave; and that both these cause fermentation and consequent decay, and unless relief is quickly given by extended ventilation, the destruction of the crop is certain. My aim, in this paper, is to point out some of the better courses to be pursued for ensuring its preservation.

The course to be pursued, in taking up for permanent graving, should be as follows: The tops should be stripped off by *hand*—not cut with hook or hoe, as is customary. The bulbs may either be ploughed up by a skeleton plough, taking care to plough deep enough so as to leave the turnip uninjured; or they may be dragged up by picks in the usual way, but in such a careful manner as not to injure the bulb. The former is preferable for permanent keeping, as fewer bulbs are injured by the process of ploughing than by dragging or picking, which is the chief object to be kept in view, *i. e.*, to have the turnips graved without injury. To ensure this, no fork or shovel should be used; but all the turnips should be thrown into the carts, and from the carts into the grave, by *hand*. The whole should be carefully packed in the same way as I have recommended in my last paper (the

storing, &c., of mangold wurzel), and the immediate covering by thatching should be the same; but in the subsequent covering I would strongly recommend the adoption of any material likely to act as a preventive against severe frosts, but not to obstruct the required ventilation. For this purpose nothing answers better than a thick coating of dry stubble, straw, or like material; and where the occupier produces much stubble on his farm, I do not think he can better appropriate it than in covering up his Swedish turnip crop: it is always ready for litter as he requires the turnips, and it is as well and economically stacked upon them as in an ordinary stubble stack. I cannot well recommend covering the graves with earth; but it often occurs that no other covering can be provided, and therefore it becomes indispensable. In such case, the graves should be left simply in their thatched state so long as the season will admit, as no great danger will arise from slight frosts. They should then be earthed up to within a short distance from the top, and covered finally with stubble, straw, ditch-roadings, or the like, and this not so firmly as to impede ventilation. I have known large graves of Swedish turnips to have been effectually preserved through somewhat severe winters by merely a thick coat of thatch over the graves; and that being well secured, so as to prevent the rains entering the bulbs, the bulbs have been considerably frozen, but the ventilation being so good, they have nearly recovered their quality in the spring, and certainly but few have rotted. I have seldom derived much advantage from storing them in root-houses or hovels: that they would keep well thus stored I have no doubt, provided they were not thrown in too thickly; but the defect here is, that almost all root-hovels are built too large or too high, and few farmers are satisfied unless they are filled. This is wrong; the superincumbent weight alone will cause the bottom bulbs to rot, which soon affects the whole mass.

I have long had my doubts as to the desirability of graving the Swedish turnip for permanent use: that it is very valuable in the spring, if well kept, I am free to admit; and that the field where the crop was grown is at the same time doing the occupier good service by producing a crop of wheat, I am equally ready to allow; but, taking into account the heavy losses sustained from the putrefaction of this crop in grave, and weighing the advantages and disadvantages, I have been led to discontinue the practice on my own occupation, preferring to substitute mangold wurzel as a crop for permanent preservation, and to consume the Swedish turnip crop for the most part on the field it grew upon. My usual course is this:—My flock having consumed the coleseed and common turnips, are put upon the Swedes. I commence by taking up a few acres, and put them into temporary graves. This is done as follows:—The tops are cut off with a common wheat hoe, with which a workman will perform upon one row as fast as he can fairly walk, and as they are for immediate use, no loss ensues. The skeleton plough is then passed under them, drawn by one horse, leaving the turnips standing upright; the turnips are then thrown into convenient heaps or graves by taking fourteen to eighteen ridges at a time, and casting them as far as a man can fairly throw them to the heap from before, behind, and on either side; they are then nicely rounded up, and immediately covered with earth; a lad appointed to set out every heap precedes the company, and a field cleverly set out at measured intervals and with heaps all corresponding, is a pleasing sight in early spring husbandry. The Swedish turnips in open winters will continue gradually to gain bulk throughout the whole season, which is a matter worthy the consideration of every occupier. The course thus pursued gives this advantage; and as the feeding proceeds, I take up fresh ground, always taking care to have a fair quantity in hand for use; and as the spring advances, and the crop evidences a disposition to renew its growth, the whole is taken up, and graved as before named. The flock consume the tops as they are taken off, being conveyed to them in carts. The turnips are evidently benefited by being taken up. They are in beautiful condition for food in about a fortnight after graving: the earth all drops off, and from the very slight heat they have undergone, the bulb itself appears to have derived additional nutritive value, cuts up in a better state, and is more relished by the sheep.

P. F.

ON STORING THE TOPS OF MANGOLD WURZEL AND BEET ROOT.

DEAR SIR,—As the season is about to commence for taking up the mangold wurzel and beet root, I am induced to address you on the subject of economizing the tops of those plants, which, properly managed, would form a valuable item in the grazing account of a farm. In France and Belgium, the saving of these is only second to that of the roots; and, in fact, on a dairy farm the tops are found to be of the most value, taking weight for weight, when cured. In that state they are found to increase the quantity of milk, and greatly to improve the quality, divesting it entirely of the taste of the root, and giving the butter the flavour of that from grass-fed cattle.

The following is the process by which the tops are cured on the continent, and which I extracted from a Belgian paper (La Sentinelle des Campagnes) three years ago, and published in a Dublin paper with which I was then connected.

When the roots are taken up, the tops should be cut off

close to the shoulder, and carefully laid in small heaps. Trenches are then dug, the same as for potatoes or mangold wurzel roots; into which, a layer of the foliage is placed, about six or eight inches thick. Salt is sprinkled over these; and then another layer is put in, which is likewise salted; and so on, layer after layer, bringing them to a sharp ridge at the top, above the ground. When this process is completed, the whole must be excluded from the atmosphere, by covering them carefully with earth, beaten hard and smooth with the spade; this is of so much consequence to the success of the plan, that, as cracks or fissures occur in the bank (which they will do, as the salted foliage is condensed by the evaporation of the vegetable moisture), they must immediately, and from time to time, be filled up.

In six or eight weeks the conservation of the foliage will be completed by the evaporation of the moisture, and it will be fit for use. It is particularly adapted to the feeding of milch cows, and is found both to increase the quantity of the milk, and improve the quality of the butter, making it equal to the best grass butter of summer. *All* cattle are excessively fond of it, and will leave any other food for it. It is found also to preserve them in health, which is attributable to the salt; and calves reared with the milk of cows fed on it thrive very fast. About three pecks or a bushel of the leaves per day (with other food) is a good allowance, and their valuable qualities render it desirable to make spare of them. The following rules must be attended to, *strictly*, in their preservation:—

1st. Choose a dry time for cutting and salting the leaves.

2nd. In storing them, the lower layer should be the thickest, as the salt from the upper ones will drain downwards, as it dissolves with the evaporated moisture. The layers therefore should diminish in thickness to the last.

3rd. The quantity of salt applied to each layer must be calculated so as to allow half or three-quarters of a pint to four cubic feet of foliage, giving the upper courses a greater proportion than the lower, on account of the drainage.

4th. The trenches should be from 12 to 15 feet wide, and of such depth as the dryness of the soil will allow; but it will be better to have the ridges higher above the ground than to let them lie in water in a deep trench. The trenches are usually made in the field in which the roots are grown; but every farmer will suit his own convenience in that particular.

The foliage retains but little of its moisture, and has, in fact, the appearance of dry leaves. In storing them, they should be *gently* (but not hard) pressed down in the trench, otherwise they would sink below the level of the ground. The ridges may be raised from three to five feet above the level ground, and the mould over them carried to a steep slope so as to shoot off the rain. Experiments have been made to preserve the leaves in casks, and trenches formed of masonry; but these, not allowing the moisture to evaporate, the whole mass decomposed and became useless.

It will be advisable to cut drains on each side the trenches to carry off the rain-water that shoots from the sloping sides. This may be conveyed into the ditches of the field.

Thus cured, the tops may be preserved to a late period of the spring, and will be found invaluable for the purposes above stated. The importance of thus economizing this portion of agricultural produce is highly estimated by the Belgian farmers, and is worthy of the consideration of those of England. Hitherto, full half of it has been wasted for want of such a plan. Having so large a quantity of them to dispose of *at once*, it has been found impossible to use them profitably whilst they were in a fit state for fodder. Consequently, a portion of them having been appropriated to the use of the cows or young stock, the remainder was left in the field for the sheep to browse over. In both cases, they become, in a day or two, so trodden upon and despoiled, as to be entirely useless otherwise than as manure.

I am, dear Sir, yours respectfully,

Oct. 28th, 1853. S. C.

CATTLE GRAZED FOR PROFIT versus ORNAMENTAL GRAZING.

Sir,—As well as the handsome high-bred Durham, Hereford, and North Devon cattle, the Buckinghamshire, Leicester, Northamptonshire, and Warwickshire graziers of the first magnitude require a breed of cattle with hale constitutions, nay, animals that will not quake or shiver in the bleak north-easterly winds in the winter season when put on land without shelter after the fat oxen are gone to market. Nay, the most practical men purchase a hardy race of black cattle as scavengers, *alias* land cleaners. I mean, when I say scavengers, cattle to eat off all the old rough grass left, as all land ought to be cleaned once a year. Therefore, as scavengers or land cleansers, the best judges (I mean the men who graze for profit as well as for ornament) purchase at the back end of the year, to eat off in the winter season the grass left in the summer, the said kind of black cattle. The best Highland Scots are preferred by some; and thick-backed, heavy thighed, deep ribbed, light horned, North Wales runts are preferred by others. In many instances many of the scavenger animals have nothing in the winter but what they get upon the land; and if not kept too thick upon the ground will be fat enough for the west-end London butchers in July. The high fed, pampered (from calves' early maturity), pure Durhams and Herefords may do very well after high keeping, and kept warm as parlour boarders; what would they do as scavengers? The money getting or making graziers require animals in the kitchen, to eat up that which is left in the parlour, or the food left in the parlour would be given or thrown away. Of course the high bred, fancy animals, or parlour-pampered boarders, are more than double the expense keeping as the kitchen, cleaning-up animals; and when you have done feeding them all, the Highlanders (the scavengers) are worth the most per lb.; nay, take up any newspaper, the Scots stand at the top price, and the best North Wales runts (scavengers) are worth as much per lb. as any other cattle except Highlanders. At any rate a breed of hardy, healthy, black cattle ought to be kept up. Would it not be advisable to cross the black North Wales cattle with the best polled Scots? and is it not expedient to cross the South Wales cattle with the best and largest Highland, to give the South Wales cattle more hair, with thicker backs, to stand the cold cutting winds, at the same time improve the quality of the South Wales cattle? A great many of our top, ornamental graziers of cattle,

nay, men who have bought their cattle to graze quite fat enough to eat when they purchased them to feed them, to make them uneatable fat, by having pommels of fat which would go for the cook into the dripping-pan instead of coming upon the table to eat—such ornamental graziers are tired of buying such high-fed animals, for the best of all reasons: they did not pay half so much towards the rent of the land as buying good cattle in a lean state, and making them fat enough with grass alone; because the old rough keeping which the scavengers lived upon would make fat cattle lean. A breeder of cattle does not want high bred, delicate, dainty, weak constitution, thick fat, and but little lean natured cows to breed from, that require wet-nurses to bring up their calves as they ought to be. Such animals are a nuisance upon the land of a tenant-farmer, who requires cattle to keep him instead of him keeping the cattle. Such animals may do for the lords of the soil; if they have but one calf in two or three years, they can afford to keep them. The best bred Durhams and Herefords are generally made fat enough to eat by the breeders; therefore buying such fat animals to graze would be ornamental upon the grazier's land, but not profitable. Some old, deep-rooted prejudiced people say that the Scots are not large enough. I beg to say that there were eight polled black Scots belonging to one man (fed in Norfolk), exhibited in the Great Smithfield Market last Christmas twelvemonth, that averaged 200 stones each, of 8 lbs. to the stone. Of course there were size and weight enough in them! Then why not breed such animals in England, or cross them with other breeds, to give them more stamina, milk, and constitution? Yours, &c.,

S. A.

86, *Vauxhall-street, Vauxhall, Surrey, Aug.* 29.

P.S. This letter is to the feeders or graziers of cattle, not to the breeders, whose interest is to feed them high from calves.

ROTATION OF CROPS.—ROOT-GROWING.

Sir,—Among the many and varied systems of cropping and rotation of crops which the improved state of modern agriculture presents to our view, none are more interesting or more deserving the special attention of all engaged in the science than that of root-growing; and when it is considered that by the introduction of root crops on our stiff soils in the place of their lying bare fallows, we put ourselves in possession of elements capable of producing twenty-five imperial stones of beef or mutton per acre, the question seems no longer confined to the produce only, but becomes matter for the serious consideration of the consumer as well.

It has been said that "the man who grows two blades of grass where only one grew before, is a greater benefactor of his species than all the poets and philosophers that ever existed." What, then, are we to say of that man who might, by the judicious management of his fallow lands, increase his own wealth, the wealth of the owner of his soil, by enriching that soil, and also the resources of his country by increasing the supply of animal food, yet who is so biased by prejudice or ignorance, or perhaps a combination of both, as to allow his fallows to lie a blank, a cheerless void, instead of having on them a flourishing green crop, which would cheer the heart of man and beast? We can only stamp that man as a false friend to himself, and brand him as a bitter enemy to the best interests of the community at large.

I happen to reside in a part of the country where bare fallows are the rule, and green crops the exception, and have with regret seen this season hundreds of acres of excellent soil, which by judicious management would produce good crops of turnips, lying in useless fallows. The tenantry have generally been pretty long residents on the estate, and in conversation their sentiments would ooze out somewhat as follows:—"You must not pretend to teach us how to manage. We have farmed in this district for upwards of twenty years, and our long experience entitles us to know a thing or two relative to the best system of cropping, and we well know that any such new-fangled thing as you propound, viz., that of growing roots on our fallows before wheat, will eventually entail ruin on the hapless wight who is reckless and foolish enough to spend his labours and capital on any such improvident system of farming." Such are the arguments we hear daily, and all the rhetoric we are master of is of none avail with this self-conceited and prejudiced class of men.

By dint of figures, we beg to make good the assertion we started with, viz., the many benefits to be derived from root-growing in place of summer-fallowing our land.

In summer fallows it is the custom here, as it is in many parts elsewhere, to manure the land with ten or twelve tons of farm-yard manure for the wheat. The same quantity of manure and twelve bushels of bone-dust would be quite sufficient food to maintain a good crop of turnips. The soil for turnips would also require, to bring it into a proper tilth for a crop, two ploughings, harrowings, rollings, &c., more than it would for wheat. The extras for an acre would be somewhat as follows:—

	£	s.	d.
Twelve bushels of bones, at 2s.	1	4	0
One acre twice ploughed	0	10	0
Harrowing, rolling, and ridging	0	10	0
Seed and sowing	0	2	6
Hoeing and scuffling	0	9	6
Upon the supposition that the turnips are all carted off, we would require two cwt. of guano to restore the fertility of the soil to the same degree as that which is in bare fallow. Cost of guano..	1	0	0
Expense of pulling and carting turnips	0	15	6
	£4	12	6
For which we have 20 tons of turnips, capable of producing upwards of 25 stones of beef, which I value at 6s. 6d. per stone	8	2	6
From which deduct	4	12	6
	£3	10	0

Leaving the snug sum of £3 10s. per acre clear profit, to go to the purse of the farmer—the manure made by the cattle in feeding to go to the credit of the owner of the soil, and the extra amount of beef to the consumer. I assume that after a top-dressing with the guano, the wheat will yield as much after turnips as on fallow.

If you think the above communication worthy a place in your highly useful journal, I should feel much obliged by its insertion, and beg to remain, Mr. Editor,

Your obedient servant, M.

ON THRESHING AND MARKETING OF CORN.

From time immemorial it has been an anxious question of solicitude with the farmer as to what would be the best time to sell his wheat, whether before or after Christmas, or whether prices would not pay better by keeping on to Lady Day or Midsummer; while the miller and baker have been no less puzzled as to what would be the best time to buy beyond their daily wants, for corn markets are so fickle and fluctuating as to confer on them a speculative character, reducing the commercial transactions of parties to something like the chances of a lottery! If this is as it should be, it certainly is not as it would need to be; for if there is any department of British industry where speculation should be excluded, it is in the commerce of corn—because the farmer only sells once in the year, as it were; and, if that is in a bad market, the consequences are obvious. We are loud in our complaints when visited with bad seed times, harvests, and crops; but, putting calamities of this kind together, they will not all cover the losses annually sustained from fluctuations in the prices of produce consequent upon injudicious threshing and marketing. We grumble at the former because not our own doings; but on the latter are comparatively silent, "because it is our own bad luck." As to fluctuations, those of crop 1852 furnish a very conspicuous example, for they exhibit a greater loss to many than the deficiency of crop 1853, a circumstance of common occurrence in numberless cases, and not a word said about it; but when Providence visits the country with a bad harvest, as last year, complaints fill the columns of the public press from one end of the season and kingdom to the other! This, to say the least of it, is a very unpropitious state of things; and the problem we have to solve is—How can it be obviated?

Different crops may be different in quantities and qualities, and therefore have unequal values, commercially as well as intrinsically; but one crop ought certainly to possess but one value, and what is true of the whole is equally true of its parts. Parts equal in quality ought also to possess equal values, due respect always being had to the interest of capital. This is one of those axioms in commerce which requires no proof; *and the commerce of corn and bread is not an exception.*

"To find out the seat of the disease," it is said, "is to effect half a cure;" and the disease in question—the fluctuations in the price of corn—are produced by the irregular manner it is threshed and thrown upon the market. As yet, for example, little wheat of crop 1853 is threshed, and by Lady Day the larger portion of this crop will be out of the hands of farmers—affording an opportunity of speculation, and controlling, in short, the whole business of the market from the one year's end to the other, for at present it is known that by Midsummer things will be in this position, or nearly so; encouraging the imports of foreign corn, thus lowering the price below its legitimate level. As soon as wheat is fit for grinding, it is sold faster than it is consumed; consequently, with foreign for mixing, millers, bakers, &c., soon accumulate a stock on hand sufficiently large to make them slow buyers even at a reduction of price; so that a large proportion of the crop, home and foreign, is not only sold under its legitimate value, but quantities fall into the hands of speculators in magnitude such as to enable them to operate upon the prices so as to suit themselves. This may be termed "the rights of the trade," and has been claimed as such; but it is a state of things long complained of, as being diametrically opposite to commercial science and the interests of regular traders, including the farmer, and is now slowly, but surely, being put an end to by them, as will subsequently be shown.

Such being the nature of the malady, the obvious cure is to regulate the supply of both home and foreign corn. A daily consumption of bread requires a daily supply of bread-corn; than which, a more simple proposition could scarcely be propounded to practice. It is one, however, on which there is considerable diversity of opinion as to the *modus operandi* of carrying it out, as well as difficulties to be experienced; and, therefore, before entering upon these, let us examine a little more in detail the individual interests at issue, *confining our observations, let it be remembered, to crop* 1852.

First, farmers not only do not receive the full value of their corn, but they also pay more for labour, implements, and machinery, manures, and all goods purchased by them, than they otherwise would and should do. While their incomes, in short, are decreased, their expenditures are increased; a state of things quite the opposite of what should be. There is probably, for example, nothing from which agriculture suffers so much at present as antiquated implements and machinery. Now, as a set-off against this, we find at every market and meeting, farmers complaining that they cannot afford to give the prices charged for better; and how, on the other hand, can implement-makers reduce prices to their lowest level, so long as they have to pay every now and then from 10 to 50 per cent. above what they should do, or above what farmers benefit by, for the daily necessaries of life? The question is a practical and plain one, requiring no answer; for, although they cannot fluctuate their prices with corn, they must make a general increase over a series of years—in other words, a permanent advance, so as to keep themselves safe.

Second, millers, bakers, corn-dealers, and consumers sustain, if possible, a greater loss from the fictitious prices of speculation than farmers, from the manner in which they paralyze trade; for whenever wheat is elevated thus, bread and the other items in the daily bill of fare are also advanced, compelling all parties to make a general rise. But let us confine our remarks to bread—"the staff of life." When wheat sells at 50s. per qr., the flour required for a quartern loaf is worth

about fourpence; so that if the household loaf at this rate sells at 6d., there is a trade charge of 50 per cent. of the prime cost of the article. But when the quartern loaf rises to tenpence, as it now sells at, then the difference amounts to 150 per cent., or 125s. per qr., on wheat bought at 50s. Now the bulk of the wheat at present being consumed is the produce of last year—at least to a very recent date it was so; so that if our readers will turn to Mr. Willich's valuable tables, given in page 9 of the *Mark Lane Express* of the 10 ult., it will be found that the bulk of crop 1852 was out of the hands of farmers before 50s. per qr. was realized, for we do not there find this price until the middle of July. In October, 1852, the average runs from 37s. to 38s., and in June from 43s. to 45s. The average of the three quarters ending Midsummer is 44s. 6d.; and the average price to consumers for the four months following, this being a late year, may be about 120s. Hence the extra capital required by millers and the trade generally with the consequent losses sustained.

Such, therefore, being the facts of the case, it need not be wondered at that growers and consumers have long complained, the former of having received too little, and the latter of having paid too much; while millers, bakers, and the regular intermediate traders, who have their daily customers to serve, have shared in the general loss, and that they should ultimately have joined hands to put down a practice which treats them thus. The prospects of receiving 80s. per qr. for crop 1853, instead of 45s. as for crop 1852, may sound very well in the ears of farmers; and it may do very well also for interested parties to boast of their experience as something to be relied upon in deference to the opinions of those who oppose their speculations, so as to induce millers and bakers to believe in a farther advance; but without conceding that the sellers' experience is of less value than the buyers' what is the value of the experience of parties interested in the corn trade who are promising 80s. and upwards for crop 1853, while they themselves are getting rid of the remainder of crop 1852? Let facts speak for themselves. For instance, what is their experience of crop 1852? Why, simply this. About this time last year they were buying wheat at 40s. per qr., and at present are selling part of the same crop at 80s., and not content with the money!—for it cannot as yet be said that we are consuming crop 1853, foreign wheat being of 1852. Commercial science, in short, is progressing, establishing statistical facts from which to deduce her conclusions, instead of the speculative opinions of the olden time, here ycleped experience. Twelve months hence will be soon enough to ask Experience the price of crop 1853. Growers now know what they received for the past year, and consumers what they have paid. Here is the limit of experience. Next year at this time another year will be added to their experience, but until then they cannot bring facts to bear upon the subject in the absence of agricultural statistics, so that at present parties are left to be guided by the wisdom of the old maxim, "Don't count your chickens until they are hatched." In short, we are discussing crop 1852, and it is experience which has convinced both growers and consumers of the truth of th proposition enunciated in this paragraph, that the one has received too little and the other paid too much for it; and millers, bakers, and corn-dealers that their interest is identical with that of the other parties.

Such, therefore, being the position of parties, our readers will readily perceive the object of the question at issue—to reduce the enormous differences now experienced between the price paid by consumers and that received by growers for bread corn to their proper level, excluding the speculative prices of third parties, whose interference in the corn trade commercial science declares to be no longer necessary at all, for a daily consumption requires a daily supply, as has already been said, and prosperity to trade in its fullest sense demands a regular price throughout the year, so as to reduce the expenditures of all parties to the lowest level. Now, to effect these desirable ends, farmers must thrash out wheat and other corn crops for market no faster than required for consumption. Consumers eat bread during the fifty-two weeks of the year; and before they can get it of the best quality and at the lowest price, and before farmers can get the highest attainable price, and millers and bakers the best article, wheat, home and foreign, must also be thrashed regularly during the fifty-two weeks of the year, for it keeps better in the straw than in sacks or granaries, and new-thrashed always makes better flour and bread than old-thrashed, the former being sufficiently dry for grinding. If a farmer, for instance, grows 1,000 quarters of wheat, he must thrash and sell some 20 quarters weekly until his stack-yard is empty; and it will be necessary not only to attend to this, but also not to let his wheat out of his barn until sold, so as to guard against any irregularities of foreign supplies.

Millers and bakers, on the other hand, will have to employ travellers or commission agents to purchase foreign corn as they require it direct from foreign farmers, should they not consign it directly to the hands of factors or commission agents here. The benefits to be derived from the working of such a practice—one by no means novel, although yet the exception—are too manifest to require notice; so that the grand question at issue is its general adoption; for its being already in successful operation in part, places it beyond the charge of theorism, and in some measure the criticism of the old school also, or even objections of any kind whatever.

It sometimes occurs that works half done take longer time to finish them than others not commenced; and some doubtless may conclude that this will be the case with the work in question, for many jobs will be begun and finished before we can hope that speculation will, root and branch, be excluded from the Exchange. The fact, however, that the work of economy—as enunciated in the preceding paragraph—harmonises with the progress of agricultural and commercial science in every respect, secures for it success ultimately, and probably at a less distant date than many may imagine; for the triumphs of both of late have exceeded the expectations of the most sanguine and enterprising in either.

The progress and success of the parts in operation will best exemplify the working of the whole. One of the many advantages of railway and steam-boat communication is that it enables farmers to forward samples to their corn-factors or agents, and the stock when sold direct to the purchaser, without incurring unnecessary expenses, loss of time, or derangement of the market. There is a large quantity of corn sold weekly in this manner, both from the provinces of England and the continent of Europe; and a comparison of the accounts of sales of this plan and the old one is the best way of practically showing the benefits gained.

Again: Mixed husbandry, including the house-feeding of stock winter and summer, is fast gaining ground; demanding a daily supply of fresh threshed straw for food and litter at all seasons of the year, and hence affording a weekly supply of wheat for market, according to our proposition. There is nothing which wastes faster than new-threshed straw and corn, especially when done by machinery; but into details of this kind our limits will not permit us to enter. Enough has been said to show the progress and success of the work at issue.

Further: Many companies in connexion with the milling, baking, distilling, and brewing branches of trade, have travellers or commission-agents in the provinces of England and the continent of Europe, buying wheat, flour, barley, &c., for them direct from farmers; while almost all the breadstuffs of the United States are sold in this country by the agents of the sellers. The quantity of corn and flour now purchased on speculation, or even sold by the regular corn-factors, is small in comparison with the consumption to what it once was. Hence the conclusion on this head.

Lastly: Agricultural statistics are daily becoming more and more a practical question, both at home and abroad. With the statistics of importing and exporting lands before them, growers and consumers—home and foreign—could, with the aid of railways and "ocean parcel delivery companies," exclude the speculation of which we complain.

We have thus very briefly glanced at one of the most important subjects connected with agriculture—one involving millions annually, and which would therefore require volumes to do it justice, instead of a column of the *Mark-lane Express*. We have seen the enormous fluctuation in the prices of corn—the produce of crop 1852—although intrinsically of equal values, amounting to from twenty to a hundred per cent. of the prime cost; while the difference between the growers' and consumers' prices exceeds even this exorbitant rate during the last four months of the consumption of this crop—the difference during this period exceeding £25,000,000 in comparison with the previous nine months! a difference altogether out of keeping with the economical spirit of the age, and which has long been calling on parties to look around them with a more discriminating eye. We have pointed out the cause of this untoward state of things, and the remedy; and found the work perfectly in accordance with the progress of agricultural and commercial science, such as to secure for it a successful termination. Steam, "the rail," statistics, the telegraph, and all other things are progressing together so as to exclude wild speculation from the commerce of corn at no distant date, securing to growers, consumers, and the trade full value for their labour, goods, and money.

ON THE WINTER FEEDING OF SHEEP.

SIR,—I have enclosed you a paper on the winter feeding of sheep, in the hope that it may find a corner in your valuable publication.

I am, sir, yours, &c.,
ROBT. BOYD.

Inverleithen, Oct. 27, 1853.

That food and shelter form the true basis of all animal existence cannot be questioned for a moment; and it is therefore altogether astonishing that so little exertion has hitherto been made to procure the food necessary for the winter and spring feeding of the woolly inhabitants of our mountains. Independent of self-interest, the mere considerations of humanity alone ought to be sufficient to awaken in the store-master every energy to adopt such measures as are best calculated to procure food and shelter for his flocks during a storm. We are well aware that the quantity of bog hay that can now be collected, in consequence of the surface draining of the mountain pasture, is a mere fractional part of that collected in the days of our forefathers; but we are not less aware that even in the best cultivated districts of Scotland there will always be a piece of land which may be advantageously used for the raising of hay, by irrigation or surface manuring, as an addition to the cultivated farm. And in mountainous districts, forming vastly the greater part of the whole country, where tillage on any considerable scale is difficult, inexpedient, or impracticable, the raising of hay, for the support of live stock during the severities of a protracted winter, as also producing an early bite for the lambing ewes in spring, is an object of primary importance; and in this respect the resources of the water-meadow may frequently be made available with the best results. In all our mountainous districts there is an abundance of sloping and low land, barren, or productive of the worst herbage in its natural state, which admits of irrigation, from those innumerable rivers and mountain-streams by which these districts are traversed. Some years ago we witnessed a most interesting experiment, upon a portion of a fifty-acre field which had been sown down in grass, about twenty years ago, in the worst possible condition, and was so completely overgrown with fog, that it was literally of little or no value whatever. The shepherd, however, of his own accord, in the early part of the season cut a drain or conductor along the highest part of the ground, to enable him ultimately to irrigate the whole field. The drain was supplied from a mountain rill which takes its rise at an elevation considerably higher than the highest part of the field upon which the experiment was conducted. It was highly gratifying to the shepherd to observe, in the course of a few months after the water had been put upon the field, that the thick matted fog which had so com-

pletely taken possession of the soil, to the almost total exclusion of every other description of herbage, had been completely extirpated, and that there had sprung up in its place a rich thick sward of white clover. This affords a valuable lesson both to proprietor and tenant, and points out at what a trifling expense many thousand acres of land similarly situated might be converted into productive meadow or rich pasture field, and of what inestimable value is even a few acres of such land to the various stock in the spring months. It has been well stated by one to whom cultivation is deeply indebted for scientific research and patient enquiry, that "nothing is more wanted in agriculture than experiments in which all the circumstances are minutely detailed." And without any desire to convert the farmer into the philosopher, it may be maintained that the union of scientific principles with practical knowledge is of the highest importance, and the germs of discovery are often found in rational speculations, and industry is never so efficacious as when assisted by science. We have ourselves, on the first of August, seen sheep eat salted ferns with every apparent relish, which had been cut while young and succulent, and we may therefore with much propriety conclude that salted well-got natural hay would be eaten with still greater relish, at any season of the year, in particular by the lambing ewes, in a cold ungenial spring, such as that of last year. We have long been of opinion that if salted food (and the more miscellaneous the herbage the better) were given to the flocks more frequently, it would not only be highly conducive to their general health, but would exempt them from many of the diseases which they are heir to, particularly the rot, which not unfrequently makes such fearful havoc amongst the mountain flocks in many districts of country. Few or none will dispute the value of a few turnips for their flocks during a storm. Many of the largest of our stock farmers, however, do not grow a single turnip; and although they did, how very frequently does it happen, before they have made up their mind to commence feeding, that the turnips are so deeply covered with snow, as to be placed altogether beyond their reach! The practice of sending the young sheep from the mountainous districts to the valley, to be fed on turnips for a few months during winter, has been abandoned by many, as they found to their sad experience that the teeth of their sheep had been so much injured by eating the frozen turnips, that they were in a great measure rendered unfit for permanent or hill stock. One of the greatest errors that can be committed, in the management of stock during a storm, is to be too long in commencing the feeding of the flocks. Once allow them to deteriorate, and it will be found no easy matter to restore them again to their wonted health and condition. A well-smeared sheep will be an equivalent for a certain amount of food. The more amply our flocks are protected, the less urgent becomes their appetite for food, because the loss of heat by cooling, and consequently the amount of heat to be supplied by the food, is diminished. We have long advocated the propriety of cultivating the whin and broom for the winter feeding of sheep, which ought to be sown or planted in large semicircles, so that they might serve the three-fold purpose of food, shelter, and shade. They fill up the blank in green feeding between the decay of herbaceous plants in autumn and their renewal in spring, and they afford a nourishment more wholesome and palatable than can be afforded to sheep during that interval, with the additional recommendation of being in general suitable to the soil of our pastoral districts. The Ulex strictus, or upright Irish whin, has the greatest number of shoots, and being of a less prickly nature than the French or Scotch varieties, it is on that account more relished by the sheep; but from its tender nature it is extremely apt to be cut down by frost, when the Scotch and French remain unscathed. It may be necessary to state that the Irish whin is a mere variety of the common plant, and can only be raised by cuttings, and cannot be propagated from seed. The whin ought never to be cut, but portions of it should annually be burned to keep its shoots tender and succulent. "If you want a bush, burn a bush," is one of the truest Scotch proverbs. The natural sap in the stumps of the cut whin keeps oozing out until they become like a piece of seasoned timber, and consequently long before it can be discovered that there is any life in the plant whatever; but very different is that of the burned bush, the stumps in consequence of the burning have become in some measure hermetically sealed, and consequently the natural sap is retained, which has the effect of producing numerous and vigorous shoots in an amazing short period of time. It has long been a well ascertained fact that both the whin and the broom possess medicinal properties for the sheep, and in particular an antidote for the rot. It may be stated with some truth that whins and broom occupy no space, as it will be found from the shelter they give to the soil, that the quantity of grass is not only much greater, but some weeks earlier than it would have been had there been no whins and broom whatever. The planting of whins and broom may be considered a permanent improvement of no ordinary kind, and therefore ought to be executed principally, if not wholly, at the expense of the proprietor of the soil. As it may not be generally known even amongst shepherds the effect that broom feeding has upon sheep, it may not be considered out of place to mention that while the Bard of Ettrick was a shepherd with Mr. Laidlaw, Blackhouse, (long the intimate friend and amanuensis to Sir Walter Scott), he was despatched to the Banks of the Annan to pay the grass mail for the young sheep which had been grazing during the storm, and to conduct them in safety to their native glens. The distance being too great for the hoggs to travel in one day, the shepherd found it necessary to take up his residence for a night at a farm-house by the way-side. And while comfortably situated at the farmer's ingle, enjoying himself with the good things of this life which were presented to him in abundance by his worthy host, the Blackhouse hoggs were snuggly lodged in a sheltered situation in the neighbourhood of the farm-steading. Scarcely had the first streaks of day become visible in the east, when the shepherd moved out to examine the condition of his fleecy charge during the time his kind landlady was preparing for him a comfortable breakfast. On reaching the spot where they had been sheltered for the night, the scene was such as neither the Bard of Ettrick nor his dog Hector had ever witnessed before; in fact, they were stoitering and tumbling in such a manner that any one who was not aware of the cause which had produced so extraordinary an effect, might with some propriety have concluded that one and all of them had been partaking not less liberally of the old farmer's "mountain dew" than the shepherd himself. Hector the First, although of less celebrity than his successor, who makes so conspicuous a figure in the "Winter Evening Tales," was nevertheless a dog of more than ordinary sagacity; in this instance, however, he was found wanting, and stood for some time mute and motionless, looking towards his master for directions how to act in a case which never before came under his notice during all his experience in herding. The shepherd himself seemed perfectly dumbfoundered, and felt horror-struck at the apparent idea of being mocked or reproved by the very animals under his charge. One of the resident shepherds, however, stepped forward and disclosed the secret, by telling Mr. Hogg that his sheep had been feeding on broom during the night, and it being a strong narcotic, never failed to produce a stupefying

effect upon stock unaccustomed to that description of food. At this explanation the shepherd seemed more than delighted, and exclaimed with rapture that a fellow-feeling (being both Hoggs) makes us woudrous kind. The sheep were immediately removed from the neighbourhood of the broom, to a field at some little distance, where they remained until the shepherd had breakfasted and taken his parting cup with the old farmer, of whose kindness we have often heard Mr. Hogg speak. The shepherd, in returning to his fleecy charge, was overjoyed to find they were themselves again, and without loss of time moved off for Blackhouse, which they reached without having lost a single sheep, either from accident or disease. Every shepherd of experience and observation must have noticed how very superior in condition the lambing ewes and sheep were which had been fed on whins and broom during a storm, to those which had been fed on the best natural or artificial hay. The former, from their healthy brown colour, more resemble turnip fed sheep than mountain stock. They are also all but exempted from diarrhœa, which the hay-fed sheep are apt to be seized with the moment they partake of the moist pasture, and which not unfrequently reduces them to a condition anything but calculated to secure a successful lambing time. From the difficulty of procuring hay last winter during the storm, many were induced to thin their plantations, that they might give the fir tops to their sheep, and not a few of them found to be true what was many years ago pointed out by Mr. Little, that the woolly people thrive better upon half hay and half tops than upon whole hay. Salted pea straw, too, is considered by many superior to either natural or artificial hay, for the storm feeding of sheep, as they have found from experience that their flocks are less apt to fall off in condition than when fed on the former. It may not be generally known that when pea straw is given to turnip-feeding sheep, it has not only the effect of communicating to the flesh of the animal a beautiful tint, but at the same time gives a flavour to the mutton which is highly relished by every palate. A few bolls of oats ought to be at the command of the shepherd, to assist, if found necessary, in eking out the hay during the protracted winter, when the whole face of vegetation is completely covered—when the frozen surface of the snow is almost impervious to the foot—when the animal, using its utmost exertions to procure its food by dint of labour, becomes embedded in the snow—when the blast howls fearfully above, and the drift spreads dismally below—when the bed of the hollow becomes a plain, and mountains appear to rise from every hillock,

"When houndless snows the withered heath deform,
And the dim sun scarce wanders through the storm."

It is then that the whins and broom, and the well sheltered stall, and the well filled rack, reward the diligence of man and insure the security of his flocks.

SOUTH DEVON AND NEWTON ABBOTT AGRICULTURAL SOCIETY.

NEWTON ABBOTT POULTRY SHOW.

The great benefits which have been derived by agriculturists from the operation of agricultural societies have added to the importance of every meeting tending to promote the noble and most useful art of agriculture; and therefore it was natural to expect that the attendance at the annual meeting of the South Devon Society would be very numerous, especially when held in conjunction with the Newton Abbott Association. This was fully realized on Tuesday, Nov. 8, the day of the annual meeting of the united societies, when Newton appeared to be densely populated by ladies, gentlemen, farmers, and labourers, attracted there by the occasion. Fortunately the day was very fine, much finer than could be hoped for in the usually dreary month of November; and we understand that this is no exception to the aspect of the day on which the past sixteen annual meetings of the society have been held—a very remarkable circumstance, which shows the happy auspices under which the society works.

The ploughing match was commenced at half-past nine o'clock, in the Deer Park, in the occupation of Mr. W. Mudge, adjoining the road leading from Newton to Torquay, and near the railway station. The field was extensive, and had a considerable elevation in the centre, where marquees were erected, one for refreshments and another for the exhibition of agricultural seeds, by Mr. W. E. Rendle, of Plymouth. From this point, where a great number of spectators assembled, a grand view of the adjacent country for miles around could be commanded; and on this account, as well as for suitability for the match, it was a happy selection. The soil was on dunstone, and the field of clover lay. Some of the ploughs competed in an adjoining field, belonging to Mr. Mudge. Much interest was evinced in the match, and the work, for the most part, was cleverly performed. The number of entries was thirty-two, and twenty-nine of them started.

EXHIBITION OF ROOTS, GRASSES, SEEDS, &c.

In the show-yard stood conspicuous a marquee, sent up from Plymouth, and underneath it was arranged an excellent collection of agricultural roots, seeds, and manures from the well-known establishment of Messrs. William E. Rendle and Co., seedsmen, Plymouth. The collection comprised some very superior bulbs, and among them we noticed the far-famed "Orange Jelly" turnip, which was exhibited in much perfection. The seed was not sown till August, and the bulbs were of a good size. This will prove a most excellent turnip for *late* sowing. We also observed some very fine bulbs of Rendle's Purple-top Swede—a root now coming into general use. It is a very hardy variety, and produces a great bulk per acre. We understand that it is very much esteemed by all who have grown it. There were also specimens of Skirving's Improved Swede—a well-known sort, of established merit; and by their side some beautiful specimens of Laing's Symmetrical variety; as also some good roots of Matson's Swede, Ashcroft's Swede, Rivers's Early Stubble Swede—a sort held in high repute as a late sowing variety—the Yellow or Tankard Swede, Green-top Scotch Turnip, Hood's Large Imperial Yellow, Skirving's Purple-top Scotch, Green-top Bullock, Lincolnshire Red Globe, Purple-top Aberdeen, Gordon's Yellow Globe—a most valuable Scotch turnip, presented to the exhibition by Alexander Gordon, Esq., Culter House, Aberdeen—Rivers's Large Yellow Stone—the Woolton Hybrid, Dale's Hybrid, and several other varieties of established merit. The roots of mangel-wurzel were very fine, and of first-rate excellence, and were kindly presented to the exhibition by Mr. Thomas Eastcott, land-steward to W. H. P. Carew, Esq.; J. Parnell, Esq., Bowden Yealmpton; Thomas Newman, Esq., Mamhead; and they comprised Fisher Hobbs's Yellow Globe, the Bugle Horn, the Red Globe, and Long Red varieties.

Messrs. Rendle also exhibited a collection of various kinds of grasses, selected for their value in producing fine meadows and pastures, and ornamental parks and lawns; and a full assortment of various kinds of agricultural seeds, including meadow and pasture grasses, renovating grasses, permanent lawn grass, Italian rye grass, Dickenson's Italian rye grass; clover of all kinds—Alsike Hybrid Clover, Bokhara clover; Swede, Scotch, common, and hybrid turnip, of the best sorts; cattle beet; parsnip; large white Belgian carret, large red Altringham ditto, large yellow Belgian ditto, other varieties of carrots; cabbages, field varieties; Keene's Forty-day Maize; beans; field peas; vetches; common parsley; linseed; long red mangel-wurzel, Yellow Globe ditto, Red Globe ditto, other varieties of mangel; rape; lucerne; trefoil; lentils; mustard; Gold of Pleasure; St. John's Day Rye: also a number of Indian-corn heads, of the variety called Keene's Forty-day Maize. The examples exhibited were grown in Mr. Rendle's nursery last year, without any care: the seed was sown in the open ground about the 20th of May, and the produce gathered about the middle of September: no attention was paid, excepting the cleaning of the ground. Messrs. Rendle also exhibited a collection of all the most important natural and artificial manures, including Peruvian and Government Bolivian Guano, Lawes's patent superphosphate, nitrate of soda, gypsum, South America animal manure, Lawes's bonedust, &c., &c.

The exhibition of roots, grasses, and seeds attracted much attention; and we observed that Sir John Yarde Buller, Bart., M.P., and many of the leading county gentlemen, took a great interest in it, and minutely examined the various specimens exhibited. And much credit is due to Messrs. Rendle and Co., as well as to Mr. Lamoureux, under whose superintendence the exhibition was got up.

SHOW OF IMPLEMENTS.

In this department nothing particularly new was exhibited, although several of the implements were of established utility. The greatest number was shown by Messrs. Webber, founders, Newton, who had on the ground a thrashing machine, clod-crusher, a roller (that won a prize at Plymouth last May) two harrows, winnowing machine, three drills, corn bruiser, three chaff-cutters, &c. Mr. Bowbury, of Modbury, showed several implements, one of which, the horse turnip drill, attracted much attention. Mr. J. Bond, of Maldon, and Mr. Whiteaway, Maldon, also exhibited. Through the liberality of John Belfield, Esq., the South Devon Society were enabled to offer prizes, although to no very large amount, for competition; had the prizes been higher, no doubt a better show would have been the result.

THE POULTRY SHOW.

This show (originated by M. Cartwright, Esq., Ford House, Newton, and brought to its present state of perfection by the labours of that gentleman and Mr. Flamank, the secretary) was held in a spacious tent erected in the heart of the town, and proved a most interesting exhibition. It was opened at noon, by which time the band of the 50th Regiment, attending by permission of Col. Sibbey, having paraded the town, the streets of which were hung with flags, had arrived at the tent, and played many beautiful airs and selections of music, to the great delight of the visitors.

The show of poultry was very excellent; many of the birds were admirable specimens of their respective classes. The number of birds exhibited exceeded 500; and the species of the Cochin Chinas was most numerously represented, although the excellence of the game fowls was the most general theme of eulogy. The geese were very inferior. Many beautiful pigeons were exhibited. The award of prizes was made under the judgment of the Rev. Grenville F. Hodson, Banwell, Somerset, and Edward Divian, Esq., Torquay.

We have not space to notice the awards of prizes, but they were all well contested.

The dinner took place at Beazeley's Globe Hotel, and a numerous company sat down to a substantial entertainment. The chair was taken by Charles Kelsou, Esq., and T. D. Belfield, Esq., acted as vice. Sir John Yarde Buller, Bart., M.P., was present, and made some excellent speeches, and which we are very sorry that we are obliged to omit from want of room.

ON THE EXHIBITION OF STALLIONS AT AGRICULTURAL SHOWS.

Sir,—I have no hesitation in expressing my decided conviction that in the majority of cases the male parent exercises a stronger influence over the character of its offspring than the female. I have known many a good foal out of an indifferent mare by a good horse; but I never yet saw a good foal by a bad horse, whatever might be the excellence of the mare. That some mares breed more after themselves than others, is perfectly true; but this power of reproducing their own character is seldom or never found, except in mares of the highest and purest blood. Such mares are usually owned by men who know their value too well to put them to an inferior horse. It was the opinion of the late Lord Spencer, that the influence which each parent exercised over its progeny was in proportion to the antiquity and purity of the race to which it belonged. This theory, the intuitive perception of which did much credit to that noble Earl's practical sagacity, may now almost be said to have received scientific proof in the experiments on sheep breeding recorded by M. Malingié Nouel, in the last number of the Royal Agricultural Society's *Journal*. Knowing, as I do, from a private source, that the accuracy of those experiments may be relied upon, I refer your readers to the article in question, with a strong recommendation to study the principles which its late gifted author so well explains. Its application to practice will, of course, depend upon circumstances widely varying. The Arabs, for instance, attach more importance to the pedigree of the mare than to that of the stallion. If they are wrong, the error is at any rate of far less moment than it would be in England; inasmuch, as all their mares being of pure blood, they will import a larger proportionate share of their own qualities to their offspring than if they were of a mixed race. And yet even the results of Arab practice militate against the soundness of their theory; for while the Arab horses have in no respect improved on those of a century ago, our racers derived from the same source are decidedly superior in symmetry, in speed, and in size, to their Arab

brethren of the present day. English breeders of thorough-bred horses frequently breed from inferior mares, or at any rate from untried ones, but rarely, if ever, from unknown horses, even of those which boast the purest pedigree. The high rate at which the services of stallions renowned for their performances and for the excellence of their stock are charged, and for which breeders are willing to pay, is a convincing proof of the importance which is attached by racing-men to the sire. Emilius covered for some years at £50 a mare; Touchstone's price in 1844 was 40 guineas; Priam never had less than £30; while Venison, Sir Hercules, Liverpool, and Melbourne have all covered at 20 guineas each. At the present day the number of stallions is so much increased, that the tendency is to a diminution of the price even of first-rate horses. Still, the Flying Dutchman's subscription fills at 30 guineas; and from 10 to 15 guineas is a very usual charge for sires of eminence.

So far, we have only considered the relative importance of the parents individually. When we proceed to examine the question collectively, the influence of the sire on the breed of horses will rise still more highly in our estimation. The mare in any one season only produces one foal, while the stallion may be the sire of fifty Suppose that in the course of her life a mare produces ten foals (which is more than an average), the stallion will easily during ten years be the sire of 500! If he is a brute, how extensive will then be the injury which he has inflicted on the breed of horses! while, on the contrary, how great a benefit will he not have conferred, if his qualities are worthy of his position! Take his progeny again, and suppose that half their number being mares, produce each three foals, or 750, while three of the remainder being kept as stallions, become in their turn the sires of 1,500 horses; it will at once be evident how enormous is the number of horses over which, for good or for evil, one stallion exercises an influence.

Our estimate of the value which the breeders of racers attach to stallions, would be incomplete without a glance at the prices which they have been known to fetch, solely for the purposes of the stud. Mr. Kirby, of York, gave £3,000 for Lanercost, and sold Van Tromp to the Emperor of Russia for £2,000. Orlando was sold for £3,000, and Iago fetched £1,500 at General Anson's sale last summer.

Such are our thorough-bred stallions — matchless throughout the world, whether we look at their ancient and spotless pedigrees, their beauty, their symmetry, and their power, or consider only their commercial value. Now let us see the manner in which they are treated by agricultural societies.

The Royal Agricultural Society has not, I believe, since the Derby meeting in 1843, given any prize for thorough-bred horses. On that occasion there was a prize of £30 offered for "the best thorough-bred stallion." I recollect that the competitors were an indifferent lot, with the exception of one horse, whose performances had proved his stoutness, but who did *not* gain the prize. Such exhibitions do more harm than good; and unless their character can be radically changed, the society acts prudently in confining its prizes to horses for agricultural purposes, and roadsters.

The Yorkshire Agricultural Society, decidedly the first provincial society in the kingdom, and whose shows rival in every department those of the metropolitan gatherings, offers many premiums to the owners and breeders of horses. As might be expected from th fame which the county has acquired in connection with this noble animal, the number of horses shown at the Yorkshire meetings is much greater than at those of the Royal Society. With regard to their quality, although it is superior to that of the horses usually found at such shows, still there can be no doubt that by attention to the suggestions which I have offered in former letters a still higher class of animals would be attracted to the ground. It affords a strong presumption in favour of this supposition, that at the recent meeting at York many of the best horses were entered as extra stock. Among the number were the stallions Don John and Maroon, and the twelve noble young horses shown by Mr. Hall, of Scarborough.

The premiums offered for thorough-bred stallions by this society are, £10 for the best, and £3 for the second-best horse. There are premiums also of the same amount offered for the best stallion for coach-horses, for roadsters, and for horses for agricultural purposes. Now if the relative commercial value of the three last classes of horses is compared with that of the first, it will be evident either that the premiums given for the latter are too high, or that the inducement held out to the owners of thorough-bred stallions is paltry in the extreme. We shall probably not be far wrong if we estimate the average value of a sound young coach-horse at £100, and that of a roadster at £50, while we may safely set the best class of agricultural horses at from £30 to £60; superior hunters, on the other hand, with breeding, symmetry, and power, readily fetch from £100 to £300. If the latter price is not very often realized, it is because it is still more rare to find an animal which is worth it. A little consideration will show that the value, or (what comes to the same thing) the quality, of a stallion must bear some proportion to that of the stock which it is intended to produce. If a breeder wishes to rear hunting colts which will command the highest prices of the market, he must eschew the refuse of the turf—horses which have been entered "to be sold for 30 sovereigns, if demanded." The power, the speed, and the endurance requisite to constitute a first-rate hunter cannot be inherited but from a sire who in his performances on the turf has demonstrated that he possesses similar qualities. And such horses, the noblest of their race, of which I have already shown the market value, the Yorkshire Society thinks to tempt into its show-yard by offering £10 for the best, and £3 for the second-best! These are perhaps fair premiums for the other classes of stallions, ranging, as I suppose their value may do, for those of superior quality, from £100 to £300. Accordingly, at York, there were twenty cart-stallions, fifteen roadsters, and twenty stallions for coach-horses entered; while of thorough-bred horses the number was only eleven. The wonder is

that there were so many, and of a quality so respectable. At Sheffield the entries were but six! Now I feel certain that within ten miles of York there do not stand less than thirty thorough-bred stallions, many of them of world-wide celebrity. Within as easy distance of Sheffield, too, I know of many superior horses which did not make their appearance there. I do not speak of these shows in particular, but of such meetings in general, when I affirm that the tendency of inadequate prizes given to thorough-bred horses is to make third-rate stallions fill the post of honour in the eyes of the public, which is not intrinsically their due. The animal which figures as "the best stallion for hunters" in the prize-list may be the best in the yard, and still be very far from being the best in the county, or even in the district. This delusion practised on the farmers and the uninitiated portion of the public cannot be too soon put an end to. It would be better not to offer any prize at all than one which is inadequate to tempt the owners of good horses to incur the risks of the show-yard.

In breeding horses, more than any other stock, does there exist a strong necessity to urge farmers to resort to first-rate stallions. Instead of this, their attention is withdrawn from them, and a factitious importance given, by means of the prize, to inferior animals, which otherwise might not have won their favour.

The Yorkshire Society's first and second prizes for bulls are £25 and £10; premiums like these attract animals worthy of them. The Royal Agricultural Society's premiums are yet more munificent—viz., £40 and £20 respectively. The consequence is that, taking one year with another, the two societies have the satisfaction of seeing at their exhibitions the best bulls in the kingdom. A very small additional outlay would enable the Yorkshire Society to attain a similar result with regard to stallions. If I might venture a suggestion, it would be that the first and second prizes for stallions for hunters should be raised to £20 and £10 respectively; and that a third prize of £5 be given in addition. I am confident that such an arrangement would cause no financial loss, because the attraction of a show of horses such as these prizes would draw, would bring an increase both of members and visitors. The third prize I look upon as important, inasmuch as out of a large number of horses it is likely that more than two would be worthy of the notice of breeders. For a similar reason, I would in addition instruct the judges to commend any horse which they might deem to deserve such a distinction. In no kind of stock is variety more desirable than in thorough-bred horses, in order to suit the shapes and the breed of the mares. Having taken these first steps in the right direction, the society will eventually find it good policy to make their premiums for stallions at least equal to those for bulls, or even, as the relative value of the animals naturally suggests, still higher. I wish to see the award of a premium to a stallion become as real an addition to his value as it has long been to that of a bull or a ram. To effect this, adequate premiums and efficient judges alone are requisite. There is no other society which possesses such facilities for making a show of horses what it should be. There within easy reach are the horses; let them be called aright, and their owners will only be too glad to respond to the summons. Let the society set about its task in earnest, and it will confer a national benefit of which it is difficult to over-estimate the importance. If the Yorkshire Society teaches breeders to find out good stallions, instead of allowing bad ones to take them in—if it shows them that a little trouble and research at the outset, will save much disappointment hereafter, and that what appears a cheap horse to begin with, may turn out a dear bargain eventually, it will not in vain have directed thought and attention to a department which is at present too much under the domain of chance.

I remain, your obedient servant,

WILLOUGHBY WOOD.

HAS OUR BREED OF HORSES DETERIORATED?

SIR,—When it has been for ages acknowledged that England has obtained universal and unrivalled celebrity for a breed of horses; when we find that enormous prices are given for various kinds of farming stock, whether it be short horns, sheep, pigs, or poultry; and an assertion is made that the character of the horse has fallen from its high estate to an extent that we cannot find efficient animals to supply our cavalry, two important features are suggested: first, that our agriculturists have devoted all their attention to the improvement of stock, at the expense and sacrifice of the horse; secondly, that our troops are insufficiently mounted. Such arguments sent forth to the world cannot fail to produce erroneous impressions. It cannot be denied, that when railroads first became the means of transit over the greater portion of the kingdom, farmers were apprehensive that the demand for horses would be materially diminished, and therefore they have not bred so many during the last fifteen years; but that is no proof that they have deteriorated. While a diminution of the number has taken place, the demand being much greater than was anticipated, like other stock, their value has increased, and they are sought for extensively by foreign dealers at high prices, which would not be the case if they were inferior to those of other countries. That the apprehension of an extensive falling off in the demand was fallacious, is determined by the fact, that in the year 1832, before railways were formed, the total number of horses which contributed to the assessed taxes, used for riding and drawing carriages, was 182,878. In the year following, 181,023, and in the year 1850, 166,460, showing a decrease of only 14,563. Any person who will take the trouble to examine the horses upon which our troops are mounted, must return convinced that, taken as a body, they are by no means defective. There are many very clever animals

in the cavalry regiments, of course there are some not quite so good; and as a proof that their constitutions are not impaired, several may be found which have been in the service nine or ten years, and are still sound and effective. The only surprise is that such horses can be bought for the money; and if I were to suggest the most effective means by which that class of horses could be improved, one of those measures would be by increasing the regulation price. If any man conceives that a good horse cannot be bought at any price, he labours under a great mistake. As the race horse has originated from the Arabian, or some other foreign blood, although we are somewhat in the dark on certain points, it is argued that we require a fresh infusion of that blood. For racing, such an admixture is known to be worthless; and for general purposes the majority of Arabians cannot be recommended: they are short, and mostly defective in their shoulders—more adapted for parade than use; neither would they produce animals calculated to carry our troops, because very few would be of the required height. The partisans of these animals affirm, that in India they undergo vast fatigue, and are gifted with great endurance; but they do not possess those qualities in England when opposed to even third-class animals of our own breed. If any man were to make a similar match to that of Mr. Osbaldeston, to ride 200 miles in a given time, he would not select Arabian horses for the performance. It will be remembered that Tranby on that occasion carried the Squire 16 miles, divided into four 4-mile heats, in 33 minutes 15 seconds, which no Arabian that has ever appeared in England could have done. I have it from the testimony of several experienced cavalry officers who have been in India, that the most useful horses in that country are produced from a cross with English stallions and the native mares; but that affords no argument that a cross in this country of our mares with Arabian stallions would be equally advantageous; and that upon the principle, because we find our own horses are superior to those of foreign extraction. Nevertheless, for breeding park-hacks, in which parade is an object, very handsome mares might be selected, with good shoulders, not oversized; but as to their being the means of increasing the stamina or powers of English horses, it is quite out of the question. If it could be substantiated as an argument, that resorting to the primitive stock would improve the breed of any class of our domestic animals, it would be an avowal that the primitive stock is superior to that which has been cultivated for ages. The fox-hound is said to have originated from the sheep-dog—an opinion which I am not prepared to indorse; but I would inquire if any master of hounds would select such an infusion for the improvement of his pack. Without resorting to the Arabian, or any other foreign strain, we possess plenty of blood without any incestuous admixture; and although the custom of breeding in and-in is resorted to by breeders of short-horns to a surprising extent, it cannot be sanctioned in breeding horses, or in fact any animals in which powers of endurance, constitution, and activity, are essentials. During the earliest ages of breeding for the turf, it was very extensively adopted. At that period it was an alternative that could scarcely be avoided. There were very few horses from which a selection could be made; and it was then considered more advisable to breed from a superior horse, although the blood was incestuous, than to make choice of an inferior animal of a different strain. Those necessities are overcome by the numbers which are in existence, and all experienced breeders avail themselves of the opportunity. Activity is an essential which should never be lost sight of in breeding horses for all purposes. I noticed a circumstance the other day which corroborates this assertion: two carts containing heavy loads, each of which had two horses attached to them, were being brought up the sharp pitch of Northumberland-street, in the Strand, the pavement of which was very slippery. Observing the difficulty which the first two horses experienced, I waited to watch the proceeding; they were large, inactive horses: the other two, which were smaller, but much more active, accomplished their task with comparative ease. In further corroboration of this, it may be mentioned that old Lottery, the steeple-chase horse, after he became incapable of performing over a country, was used on a gentleman's farm near London, till, being quite worn out, a merciful bullet terminated his career last spring. He was used, with other horses of a similar character, for all operations of husbandry, and their quickness enabled them to perform a day's work in much less time than the ordinary farm-horses completed theirs; while their activity and pluck overcame difficulties when opposed to weight, to a much greater extent than heavier animals.

I am, your obedient Servant,

CECIL.

SALE OF EARL DURHAM'S STOCK.—The annual sale of fat cattle and sheep, belonging to the Earl of Durham, took place on Monday, Nov. 7, (being about six weeks earlier than usual), at Bowes House, near the Fence Houses station, on the York and Berwick Railway—Mr. William Wetherell, auctioneer. The lots for sale were very extensive, and there was a large attendance of graziers and others from Scotland, the southern counties, and the neighbourhood, by whom the various lots were quickly bought up, at prices about £2 5s. higher than those paid last year for beasts, and 3s. to 4s. a head for sheep, and these prices, too, for animals in not nearly so good condition. The first lots were 29 half-bred cattle (steers), which sold at prices varying from £15 15s. to £23 5s. Several lots in this class realized above £20 each. The 29 sold for £517 15s. The next lots were 24 half-bred heifers. They were sold at prices varying from £15 to £21 5s. The lot brought £414 15s. The next lots brought forward were 14 short-horn heifers, which realized a sum of £286 5s. The highest was sold for £24 10s.; another lot brought £24; another £22 15s.; and the lowest £17. The Galloway heifers were next introduced to the ring. Of these there were 19 lots, which brought £336. Lot 3, a very fine animal, brought £22 5s. The prices ranged downwards—the lowest being sold for £15. The West Highland heifers (of which there were 20) brought good prices—the lots realizing £540 10s. The

highest brought £32. Two other lots brought £31 each, several £29 10s, and the lowest £23. The West Highland steers, also 20 in number, were a lot of fine animals, and brought the large sum of £632. With the exception of the first lot, which sold for £29 10s., the whole realized £30 and upwards—the highest sold for £35, two for £34 10s., one for £33, and one for £32 10s. A red and white short-horned bull, "Louis Napoleon," brought £17 10s.; and another of the same kind, named "St. Paul," £16 15s. The sheep were next brought into the ring. The first batches consisted of 43 lots of half-bred wedders, in lots of 10 each. They realized a sum of £984 10s. Many of the lots brought £24, being an average of £2 8s. each. The prices varied from this sum, the lowest being £21 10s., or £2 3s. each. Twenty-eight lots of 10 each (half-bred gimmers) brought £606. The highest realized £25, or £2 6s. each—the lowest £21, or £2 2s. each. Seventy-seven Cheviot wedders brought £181 2s. Two lots of 10 each sold for £24. Forty-seven black-faced sheep brought £106 5s. Seventy-six half-bred ewes realized £140 12s. The highest lot of 10 sold for £1 18s. each. Five hundred Cheviot ewes realized £731—the highest sold for 30s. each, and the lowest for 25s. The largest purchasers were the following:—Mr. Barwick, £804 10s.; Mr. Dickman, £406; Mr. Phillips, £407; Mr. Moor, £316; and Mr. Monkhouse, £238. The sale realized £5,510 19s.—the cattle, consisting of 168, brought £2,761 10s.; and the sheep, consisting of 1,450 head, brought £2,749 9s.

THE AMERICAN THRASHING MACHINE.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—Mechanical aid being now so extensively brought to bear in the practice of agriculture, and as every improvement whereby animal or manual labour on the farm is economised is so much national gain, all friends to progress cannot help greeting with hearty good wishes the successful efforts of every inventor, no matter the portion of the globe that he comes from. The thrashing machine, which is now intended to be commented upon, is a transatlantic importation, patented by a Mr. Spence for the proprietors, Messrs. Moffett and Knight. This invention has recently undergone a trial at the Tiptree farm, with a fair share of success. No competing machine being at the time used against it, I am unable to test its comparative excellence; report has spoken exceedingly well of it, and the columns of the metropolitan and local press have heralded forth the machine as another glorious achievement of the go-ahead qualities of brother Jonathan. Before we laud too loudly the mechanical superiority of our western brethren over the inventive genius of our own countrymen, it behoves us to pause awhile, to reflect, and to examine into the merits of the inventions that have been made at home. Every one will remember the sensation produced at the Great Exhibition by the American reaper; it was pronounced through the whole breadth of the land as a perfected machine, illustrative of the foresightedness and mechanical skill of American "cuteness." That the reaper was not of that perfection which every one had been led to expect, was evidenced by its very partial success in actual practice, and also by the various improvements which have since been engrafted upon it; further than this, the reaping machine was not a new invention, and, to the surprise of a great portion of the agricultural world, it was soon after blazoned forth that a reaping machine had been constructed by Mr. Bell, of Forfarshire, in 1829, and had been used with a success that those who witnessed it in operation pronounced triumphant. Certain peculiarities in Bell's reaper were also found in the American reaper, which has led to the inference that a knowledge of its construction had travelled to America, and the invention had been brought back again to this empire as a new discovery. The facts connected with the reaper have induced an inquiry into the American thrashing machine, for ascertaining how much of it is original. A specification of the patent—which was sealed on the 16th of April, 1853—with plans, was obtained from the Patent Office, and, upon analysis, it is found that there are three claims for originality.

"First: The adaptation and application to thrashing and winnowing machines of the open travelling apron, as described.

"Second: The adaptation and application thereto of the rack, or open floor, as described. And

"Lastly: The adaptation and application thereto of the receptacle whereby the matters that have not been duly operated upon are passed and conveyed back into the machine, as described."

The descriptions given of the parts claimed being as follows:—

"1. This open travelling apron is formed by means of an endless chain with another similar chain, the two chains forming the two side limits of the apron, and being connected together by means of rods extending horizontally between them, so as to cause them to move forward as one chain. This endless chain, or chains, is made to travel over rollers, being advanced, or set in motion, by means of a toothed pinion taking into the projection or teeth on the chain. As the chain passes over the rollers, it has imparted to it a short, tremulous, vertical motion by the projections or teeth successively striking upon the surface of the rollers. The corn or other agricultural produce, whilst being carried forward on the travelling apron, is subjected to a tremulous vertical motion, by which it is made to fall through the interstices of the apron between the rods into the trough.

"2. This rack, or open floor, is formed of a series of leaves or slats, inclined more or less in the direction of the winnowing blast.

"3. At the bottom of the tail board is fixed a trough or receptacle, into which may fall loose heads of corn and other matters that may not have passed down the interstices of the rack or open floor, and may have been too heavy to be carried over the tail-board. From this trough or receptacle, the matter thus collected falls into a trough underneath, which has in it a screw conveyer, by which the said matter is conveyed back and again introduced into the machine; and this trough or receptacle constitutes the third part of the improvements under this invention."

Taking the third claim first into consideration, atten-

tion has to be directed to a patent taken out in 1852 by Mr. Hornsby, of Grantham, who, although he does not claim it by itself as anything original, shows in his plans a trough where the loose heads of corn and other matters that may not have passed down his riddle or screen, or may not have been carried over the tail-board, are accumulated, and also a screw by which it is carried along and away. In his patent he thus specifies—

"In some machines however, differently arranged, the screws may be dispensed with for again throwing on the thrashing part of the machinery, to be again beaten and again passed through the dressing machinery; and in place of the screw an endless band of buckets, or other mechanical means, may be employed for lifting."

Spence's patent is evidently weak in the third claim, and it would be well for the proprietor of the machine to remedy this weakness by giving it a disclaimer. Leaving out this third claim, the American invention consists of a peculiar kind of shaker, or, as it is described, an open travelling apron, having a short tremulous motion, and a kind of screen composed of slats of wood stretching across, the said slats not being laid plumb, but leaning, so as to receive more readily through them the blast from the fans. A good idea of the shaker may be formed from a knowledge of the travelling platform of a brick machine, which may probably have given rise to the idea of a flexible shaker. Here, then, we have all the invention; and the question which naturally follows is—Will the American shaker and the American rack, or screen, be found to surpass the best English shakers and screens? Without one word of depreciation against the best machines of the old world or the new, I anxiously await the results of a competing trial, and cry out for a fair field and no favour.

Southwark, Nov. 15. CIVIL ENGINEER.

SIR,—Since my letter to you of the 15th instant, I have directed my attention more particularly to the peculiarities of the American thrashing machine, as well as to those of different makers in this country, and, as was stated in the former letter, am now satisfied that the third claim for originality in the American's patent cannot be sustained; for, independently of what was then stated, I am prepared to establish the fact, that upwards of three years ago one of the Lincolnshire makers constructed a receptacle for gathering the tailings that had not been properly operated upon, for again being passed to the drum of the machine; and that this said receptacle continues in use to the present time. But, beyond this fact, I have also had my attention directed to machines having oblique directors for guiding the blast from the fans more effectively to the under-side of the jack-riddle; and although I must admit that these said oblique directors do not invalidate the second claim of the patent alluded to, as they do not form a floor or screen, but are fixtures and six or seven inches apart, whereas in the American machine, according to the "provisional specification," "This rack or open floor has the *usual short backward and forward movement imparted to it*," thereby constituting it a riddle or screen, and which also appears to be the case upon reference to the plans; and, further than this, in the "Specification in pursuance of the conditions of the letters patent," we have as follows:—"that by the inclination of the leaves or slats, the spaces between them are so situated as to admit of the blast passing through them in the most direct manner, and thereby clearing them from obstructions; moreover, the liability of the spaces to become choked is lessened by their being *more or less covered by one leaf or slat projecting over another in a vertical direction.*" This description is concise and clear, and shows that any body, however small, could not be dropped from above, and pass through the space between one "slat" and another, without striking thereon; whereas, in the oblique directors alluded to, a body of considerable dimensions could be dropped through them without touching. Giving therefore to the American machine the exclusive right of the rack or open floor specified, we still have in our English machines an arrangement possessing the qualities of the rack or open floor.

In regard to the first claim of the patent under discussion, which is the prime feature of the American machine, and which is described as an "open travelling apron," being, in fact, a flexible platform or table, I am now under the firm conviction that this said travelling apron is but an innovation on an English patent taken out in the year 1850. The English patent embraces a platform or table with a vertical motion along which the corn or other agricultural produce travels having a tremulous vertical or dancing motion imparted to it during its transit, by which it is effectively shaken, and at the same time is screened through the interstices of the wire-web forming the surface of the table. Depend upon it, Mr. Editor, the patent of 1850 is the stumbling-block to the use of the "open travelling apron;" and if it were not so, as a practical man, I could not show any advantage that the "open travelling apron" has over the English platform or table with a vertical motion; on the contrary, it is more complicated, and in practice I am satisfied would be found much more liable to disarrangement.

The old saying of "much cry and little wool" will most undoubtedly be illustrated in this American thrashing machine, as was previously the case with the American reaping machine. Taking a review of the parts of the American thrashing machine, we have as follows:—

A modification of Atkinson's patent peg drum;
ditto of a patented platform or table shaker;
ditto of patented screws or worms for lifting corn;
ditto of oblique blast directors.

These modifications of English inventions, with the ordinary blowing-fan, constitute the American thrashing machine; and whatever the loud but hollow cry out may be, as to the small cost of the machine in question, it cannot be inferred, in the present day of active competition among the implement makers in this country, that from the other side of the Atlantic we shall receive equally as good workmanship in any machinery, at a lower rate of price than that which can be produced at home. But, setting aside the sources of litigation and the difficulties that must inevitably spring up between the patentees of the American machine and the proprietors of the prior English patent rights, I would still wish to see a fair trial between the American and English machines; and have no fear for the honour of "the Old Country."

Yours, Mr. Editor,

Southwark, Nov. 25th. CIVIL ENGINEER.

IMPORTANT DECISION.—IMPORTATION OF FOREIGN GRAIN.—A case of considerable importance to shippers of foreign corn, and of general interest to the trade, has been this week before the Gloucester County Court, and in which judgment has just been delivered by the judge, Mr. Francillon. In May last 1,271 quarters of maize were shipped at Ibrail for Gloucester, and were consigned to Messrs. Sturge,

the well-known extensive corn merchants of Gloucester and Birmingham. These gentlemen were the defendants to the present action, the plaintiff being a Mr. Huntley, the captain of the vessel which brought the corn to Gloucester. On the voyage the cargo was damaged by water and heat, in consequence of which it swelled, and on arrival at Gloucester was found to have increased in bulk 32 quarters, being now 1,303 quarters' admeasurement. Messrs. Sturge paid freight on the 1,271 quarters, but the plaintiff also claimed freight for the 32 quarters, and the question for the decision of the Court was, whether the plaintiff was entitled, under the circumstances, to claim freight for the excess over the bill of lading. No maize was put on board during the voyage. The council for the plaintiff was Mr. Cooke, for the defendant, Mr. Powell. His honour said, he had decided in a previous case that the quantity stated in the bill of lading was *prima facie* the quantity delivered, but that this was liable to be set right by actual admeasurement. Here the difference was admitted to have been caused by the water and heat swelling the grain, and he thought that, if he arrived at any other decision than one in favour of the defendants, he should be encouraging carelessness and even wilful damage on the part of the shipowners and merchant captains. He would also be making the corn merchant pay higher freight for cargoes damaged on the voyage than for those carried in good condition. He therefore gave judgment for the defendants.

THE GUANO QUESTION.

TO THE EDITOR OF THE TIMES.

SIR,—Another trial is about to be made to press upon the Government the importance of an open guano trade with Peru. The accompanying memorial, emanating from the Commercial Association of Liverpool, is being extensively circulated, and receiving the signatures of the various associated commercial and agricultural bodies throughout the kingdom. It embodies the main facts of the case, which I need not therefore recapitulate.

The public declarations of Ministers have clearly shown that they are already fully alive to the importance of the subject. It is understood that they have hitherto failed in their endeavours to persuade the Peruvian Government to open the trade; and it is known that an active search is now going on, under the authority of the Admiralty, for new deposits in the Pacific. In 1852, memorials on this subject were poured in upon the Government from the various agricultural bodies throughout the kingdom. They may prove more effective this year, when backed by the representations of the mercantile and shipping interests.

The state of the case seems to be this:—The Peruvians are in possession of the most valuable guano deposits yet discovered, the quantity on the islands alone (excluding the deposits on the coast of the main land) having been estimated by the late British Consul at Lima at 40,000,000 tons. Of this prodigious quantity, which is constantly receiving fresh accessions, not more than one million tons have been exported in the ten or twelve years during which the trade has existed. Assuming the correctness of this estimate, the guano, at anything like the present limited rate of supply, is practically inexhaustible; but the shipment is said to be very clumsily conducted. A numerous fleet of ships, chiefly American and English, are constantly in succession waiting their turn at the islands; and though a vessel of 1,000 tons, after being ballasted, can be loaded through the shoots in a couple of days, she has generally to wait from two to three months before her cargo is completed. The trade, in fact, is clogged with obstructions from the first chartering of the ship to the final delivery of the cargo, every separate transaction being a distinct source of revenue to the fortunate firms which have secured the sole agency of the Peruvian Government. Owing to the accumulated charges thus thrown upon the article, the Peruvian Government reaped little more than £4 a ton from last year's sales, though the freight did not probably exceed 50s. on the average of that year's importations, the remaining 50s. being absorbed in the charges of management. Freights having now risen to £4, the sales of the present year will leave little more than £2 10s. a ton to the Peruvian Government.

At the first view, it is difficult to comprehend any reason that should prevent the Government of Peru from opening the trade to all nations at a fixed price. Competent judges on the spot assert that, even with the present arrangements, if properly managed, they might ship treble the quantity. The agriculturists of this and other countries could with great advantage take this increase; and the shipowners and merchants affirm that it would be an immense boon to them to know where they could send with certainty for so remunerative a cargo. I need not again refer to the public benefit which would follow, in the great increase of corn produced by its fertilizing effect; but ever since the trade began, the agents or contractors have been under very heavy advances to the Peruvian Government—in fact, every benefit the Peruvians derive from guano is anticipated. They have thus no immediate interest in an increase of sale; and those who have an interest in continuing the monopoly may tell them plausibly enough that an increase of sale, at a lower price, would not benefit them; that, while they realized £600,000 by their last year's sale of 150,000 tons, it would be necessary to sell 200,000 tons to realize the same sum, if they reduced the price £1, thus giving for nothing 50,000 tons; if they reduced it £2 a ton, 300,000 tons must be sold, thus giving for nothing 150,000 tons, which is rather more than the whole present annual consumption of Great Britain.

Now, here is the point to press upon the Peruvian Government. We don't ask them to reduce the price: for the production of wheat or potatoes, Peruvian

guano, even at £9 5s. a ton, is the cheapest of all manures. We don't require them to give us a single ton of so valuable an article for nothing; we are quite willing to pay for it, and would take twice the quantity from them at the money, if they would give us it. All that we ask is, that they would reckon, not the highest, but the average price they have realized per ton under the monopoly, fix that price, and levy it at the islands from all applicants alike, free of cost and risk to themselves. We should look for our profit to the competition of shipowners and merchants in lessening the freights and charges of importation, and to the great advantage of a regularly-increasing supply.

If the memorial to our Government is accompanied with a clear statement, showing it to be the interest of Peru to open the trade to all nations alike, and if the good offices of other countries engaged in the trade can thus be associated with ours, the influence of the British Government, so backed, can hardly fail of success in a renewed friendly negotiation. Should an advance of money be necessary, it can surely be safely made on the same security as has proved satisfactory to the present contractors; and the interests of the Peruvian bondholders would certainly be improved by a transaction which might in a year or two double the revenue of that country.

In the meantime, while the trade is restricted and the supply limited, it is well to be publicly known that Peruvian guano, though the best guano for the production of wheat, does not possess the same superiority over other and cheaper guano as a manure for green crops. Bolivian guano, costing less by £2 per ton, has been proved over and over again to be, weight for weight, the more effective manure of the two in the growth of swedes. The larger proportion of the Peruvian guano at present imported is believed to be applied to green crops; so that the knowledge of the fact just mentioned, if acted on, would to a considerable extent set free the supply of Peruvian for wheat, while the lower price of the substitute would be a very important saving to the farmer. I, of course, refer to genuine Bolivian guano of good quality. It is a fact not generally known, that the whole of the enormous trade in guano was founded on a cargo imported by Mr. W. J. Myers, of Liverpool, in 1839, to whom we are indebted for the introduction into England of this valuable manure; and yet this first cargo, on which the character of the Peruvian guano arose, was Bolivian, not Peruvian.

20, *St. James's-street, Nov.* 24. JAMES CAIRD.

"TO THE RIGHT HON. E. CARDWELL, M.P., PRESIDENT OF THE COMMITTEE OF HER MAJESTY'S PRIVY COUNCIL FOR TRADE.

"The memorial of the undersigned, representing various associated commercial and agricultural bodies, humbly showeth—

1. That the increasing and widely-extended use of guano throughout the United Kingdom renders the existing mode of importing the Peruvian supply, upon which the country mainly depends, most unsatisfactory to the merchant, the agriculturist, and the shipowner.

"2. That on four separate occasions the supply of Peruvian guano has fallen short of the requirements of the country—viz., during the spring of 1844, the spring of 1848, the spring of 1850, and during the spring of this present year, 1853.

"3. That your memorialists believe that this periodical deficiency is clearly traceable to the fact that the Peruvian government confines the distribution of the supply in this country to one channel, and the consequent proved impossibility of meeting the varied requirements of so extended a trade by such a monopoly.

"4. That, were the trade thrown open, merchants and shipowners being allowed to purchase the guano at the Chincha Islands, it is not likely that a similar scarcity would again occur.

"5. That in seeking to get the guano trade thrown open, your memorialists have no desire to do so to the injury of the Peruvian government; on the contrary, they believe an extra addition of nearly 10s. on every ton of guano imported would accrue to the Peruvian government, without raising the price to the British consumer; 10s. per ton being about the average difference in freight at which vessels could be loaded for direct ports, instead of being chartered, as all are at present chartered, to call 'for orders.'

"Your memorialists pray, therefore, that her Majesty's government will take the subject of this memorial into consideration, and endeavour, by a friendly negotiation, to convince the Peruvian government that it would be for their own interest to throw open the trade, and to permit all nations to buy guano from them direct, without the intervention of any agents in this country.

"And your memorialists will ever pray."

HOW TO GROW SOUND POTATOES.

SIR,—There has been a large and sound crop of potatoes this year in Ireland, quite as good and as large in most counties as in any year before the disease appeared in 1846, and, as a proof of this statement, good potatoes are now selling retail in all our country market towns for 5d. per stone, and merchants are exporting thousands of tons to Glasgow and Liverpool, where they fetch retail a shilling a stone.

This supply of wholesome food is not only a great blessing to the labouring classes in Ireland, but also, without this abundant Irish crop of potatoes, the price of bread, high as it is, would be much higher in England; so the Irish small farmers' potatoes have kept down the price of the English labourer's and tradesman's loaf; yet, (to show the mistakes of the wise), if the Irish farmers had at once given up their old friend the potato, as the learned amateurs of the Dublin Agricultural Society strongly recommended them, in what a wretched state would innumerable families now be, who live on small wages, when the baker's sixpenny loaf has by degrees dwindled to its present small size?

Now, as the season for potato planting will soon come round in England (and, indeed, many have been planted already), it would be well-worth while for your country gentlemen, both for themselves and for the sake of their poorer neighbours, to follow the two simple rules by which this good crop has been obtained in Ireland, viz. (1), to plant the potatoes in new ground, that has not been tilled for many years, and if possible in peat. To plant them in ground that has lately been cultivated every year, as for example in gardens, is a certain way to lose both labour and manure. Peat soil cannot be found in all places, but there is some new rough ground in every farm; and besides the sound crop of potatoes, the ground will be brought into good order. (2) To plant them early. The old favourite time in Ireland to plant potatoes was between the two Mays, *i. e.* 1st and 12th of May, but now they are all planted in March, and cannot be planted too soon in spring.

You will save much certain loss of land and seed, labour and manure, and also help to provide food for many poor families, by drawing attention to these simple hints about the cultivation of this useful root; and which hints any stranger in England, who sees the poor labourers eating a small and cold piece of bread in place of a large and hot dish of potatoes, must wish to see well known and adopted.

Your obedient servant,

JOHN GREY V. PORTER.

Bellisle, Nov., 1853.

METEOROLOGICAL DIARY.

	Barometer.		Thermometer.			Wind and State.		Atmosphere.			Weat'r.
Day.	8 or 9 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Oct. 23	30.03	30.13	55	60	56½	S. West	var.	cloudy	sun	cloudy	rain
24	30.10	29.93	52	61	58	S.S.E.	gentle	cloudy	cloudy	cloudy	dry
25	29.83	29.87	51	62	50	S.E., S.W.	fresh	fine	sun	fine	dry
26	29.75	29.73	48	66	55	S.E., S.W.	gentle	fine	sun	cloudy	showery
27	29.67	29.66	54	61	57	S. East	var.	cloudy	cloudy	cloudy	wet
28	29.59	29.63	55	60	52	S. West	brisk	cloudy	fine	fine	showery
29	29.73	30.0	49	53	45	W. by N.	calm	cloudy	sun	fine	dry
30	30.01	30.04	42	52	46	S. East	gentle	cloudy	cloudy	fine	dry
31	30.00	29.95	41	53	51	S. West	fresh	fine	sun	fine	dry
Nov. 1	29.95	29.86	47	56	51	S.E., S.W.	lively	fine	fine	fine	dry
2	29.86	30.06	50	60	45	S.E. and S.W.	lively	cloudy	sun	fine	dry
3	30.09	30.02	42	58	48	S.E. and S.W.	gentle	fog	fine	fine	dry
4	29.97	29.99	43	56	46	S. by E.	var.	fine	cloudy	cloudy	dry
5	29.88	29.80	44	47	47	E. or by N.	gentle	cloudy	hazy	cloudy	dry
6	29.88	30.10	45	57	48	S. West	calm	cloudy	fine	fine	dry
7	30.20	30.30	46	54	50	N. West	gentle	fog	cloudy	cloudy	dry
8	30.33	30.42	49	54	40	N.W., N.	var.	cloudy	fine	fine	dry
9	30.51	30.51	32	52	37	N.W., S.W.	gentle	fine	sun	fine	dry
10	30.45	30.30	35	52	37	N.W. & S.W.	gentle	fine	sun	cloudy	dry
11	30.27	30.32	35	46	36	N. West	calm	fog	cloudy	fine	dry
12	30.23	30.20	33	48	43	E. by North	calm	fog	fine	cloudy	dry
13	29.94	29.82	41	46	42	E. by North	calm	hazy	cloudy	fine	
14	29.77	29.70	38	42	41	Variable	calm	hazy	fine	fine	dry
15	29.71	29.69	33	41	41	Variable	calm	hazy	cloudy	cloudy	rain
16	29.67	29.70	30	45	36	Variable	calm	hazy	fine	fine	dry
17	29.79	29.88	28	43	30	W.N.W.	gentle	fine	sun	fine	dry
18	29.98	30.04	26	44	30	Southerly	gentle	fine	sun	fine	dry
19	30.09	30.00	32	48	36	S. by East	lively	fine	sun	fine	dry
20	29.93	30.14	35	45	41	Sthrly.&Nthrly	var.	cloudy	cloudy	fine	rain
21	30.28	30.30	30	38	30	S., Var.	calm	fog	cloudy	fine	dry

ESTIMATED AVERAGES OF NOVEMBER.

Barometer.			Thermometer.		
High.	Low.	Mean.	High.	Low.	Mean.
30.27	29.08	29.675	62	23	42.5

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
52	40.097	46.048

Weather and Phenomena.

Oct. 23. Night wet. 24, 25. Fine days. 26, 27, 28. Showery or wet. 29. Thunder in the evening, and peculiar lightning in the night. 30. Improving. 31. A brilliant magnetic aurora at about 8 at night.

Lunation.—Last quarter, 25th, 5h. 20m. forenoon.

Nov. 1 to 14. Fine settled weather. 13. A hint of rain. 15. A sharp shower. 16 to 19. Again fine. 20. Rain at night and at noon, after several sharp night frosts with much rime. 21, 22, & 23. Much fog has prevailed of late, with a very calm state of the air.

Lunations.—New moon, 1st day, 8h. 39m. forenoon; first quarter, 8th day, 11m. past midnight; full, 15th day, 6h. afternoon.

Remarks connected with Agriculture.—The phenomena of the 28th and 31st of October certainly changed the weather, and confirmed that propitious season which has so favoured the operations of ploughing and seeding of vast breadths of land everywhere. It has proved an especial mercy, which led to a prospect of comparative abundance. The frosts have been very keen, and remind us of the three weeks of sharp weather during the November of 1851.

Croydon. J. Towers.

CALENDAR OF AGRICULTURE.

Plough stubbles and leys for Lent crops in fresh weather. Repair old fences and make new ones. Continue the cutting of drains so long as the weather allows. Mend roads, and cast up earths for making composts. Collect for manure, in some shape or form, all earthy and vegetable substances that can be got.

Flood meadows, and lay dry occasionally.

Cut underwoods, and fill up vacancies by planting and layering; plant all kinds of forest trees, especially ash and oak; keep plantation fences in good repair to prevent trespassing, a very sure sign of slovenly management. Raise turnips, and store them in dry, fresh weather; give the tops to the young cattle in the yards, and to the store sheep in the fields.

Early lambs will be dropped during this month in some places. Feed the ewes very liberally, and provide good shelter.

During frosty weather, thresh very frequently and litter the yards very often. Collect earths to the compost heaps, and carry lime for mixing with the earths. Cart stones to where they may be required for draining. Carry fuel, timber, and faggots.

This being the first month of the winter, the proper arrangements must be made for a systematic management in every department of the winter operations. The live stock require the most vigilant and unremitting attention; in being amply and regularly fed, and in having a dry and comfortable bed in the yards and sheds. Keep the steamer in constant work, and give cooked food daily to the horses, cows, pigs, and poultry: give it fresh, and allow no sourness to take place. Give to the cattle the turnips from the store pits, but in fresh weather bring them daily from the fields. The drains and culverts must be all in good going order, to conduct the urinary liquid to the tank. The cattle in the yards should eat under cover, especially in high cold latitudes. This purpose may be easily effected by having the whole area of a farmery roofed over, like the terminus of a railway. This subject will be mentioned more at large in our miscellaneous articles.

AGRICULTURAL DRAINING MATCH.

An extensive agricultural draining match was held on the Burtonwood estate, the property of Samuel Brooks, Esq., banker, Manchester, situate near to the Warrington Junction Station of the Liverpool and Manchester Railway, on Wednesday, Nov. 23. The field selected was well adapted for the purpose, and beautifully situated, commanding a magnificent view of the Sanky Viaduct. The soil consists of a friable loam on a marly substratum, with occasional beds of clay and sand. The attendance of drainers and gentlemen interested in such works was very large, and the proceedings passed off with much gratification to all parties.

The first event of the day was a match for diggers of drains. For this class of workmen three prizes were offered of £5, £3, and £2 respectively; the conditions being that three labourers should work at each drain, and the prizes should be awarded to those who should cut forty-eight lineal yards of drain, 4 ft. deep, in the most workmanlike manner, with the least unnecessary excavation of earth, and without occupying more than four hours in the execution; superiority of work to be the first consideration in awarding the prizes. For these, thirty-five sets of candidates from various parts of the kingdom, including some from Hunts, had entered, and twenty-eight competed; being started at 10 o'clock by the firing of a gun.

The prizes were awarded as follows, viz.:—

Bottom scooped to receive 2 in. pipes.

Prize	Leader of Gang.	Where from.	Time.	Top width.
1st.	J. Cubbin	Ormskirk	3.48	12 in.
2nd.	— Lucas	Worsley	3.51	13 „
3rd.	J. Burket	Preston	3.58	13¼ „
Highly commended—				
	R. Shattocks	Garstang	4.3	13 „
	H. Conway	Newton	3.39	12¾ „
Commended—				
	Gatley	Tatton	3.45	12½ „
	G. Gee	Worsley	4.0	13¾ „
	E. Orrell	Ormskirk	4.0	12½ „

The execution of the work was generally good, and elicited great praise; several of the candidates, who were disqualified through not having performed their work within the time specified, displayed much merit. The work of H. Conway's set being the first completed, and very fairly done, attracted much attention, and the men were liberally rewarded by voluntary donations from several of the gentlemen present.

For the pipe-laying two prizes were offered, of £2 and £1 respectively; thirteen candidates entered, and six competed. Owing to the lateness of the hour, the number to be laid was reduced from 300 to 144 for the forty-eight lineal yards cut by the drainers. The conditions were that the prizes should be awarded to those who should lay their pipes in the most workmanlike and expeditious manner, placing each end to end, so as to form one continuous pipe. Execution of work to be the chief consideration. This work was commenced by signal as before, and the prizes were awarded as follows, viz.:—

	Name.	Where from.	Time.
1st prize	Jas. Hodges	Garstang	16 min.
2nd „	John Quaintaine	Burtonwood	12½ „
Commended on account of quickness of execution—			
	J. Barton	Tatton	10 „

Additional interest was excited by the field being situated near to Bradley Hall, a farm-house standing upon the site of an old mansion bearing that name, erected in the 15th century. The remains of the entrance gateway, with port-cullis, drawbridge, &c., and the moat, still in good preservation, were very interesting to the lovers of antiquity. The attraction to this part was none the less from the liberal collation provided there for all the visitors, and great credit is due to Mr. Suttle, the manager, for his exertions and excellent arrangements.

About £6 was collected by John Williams, Esq, for distribution amongst the unsuccessful competitors; in addition to which each one was paid for the work done.

The Judges were—G. Thompson, Esq., Engineer of the Landowners' Drainage Company, Exeter, and 30, Parliament-street, London; Wm. Mercer, Esq., Newton, agent to Thos. Legh, Esq.; and H. White, Esq., secretary to the South Lancashire Agricultural Society. The steward to the match was Mr. Thos. Suttle, sub-agent to Samuel Brooks, Esq., of Whalley House.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR NOVEMBER.

The weather of this month has been extremely favourable for all out-door farm labours. In the whole of our leading counties, great progress has been made in ploughing and sowing, with the land in good condition for the reception of the seed furrow. The present high value of corn, and the prospect of wheat and other articles continuing dear for some time, have induced numerous farmers to increase the breadth of land under wheat culture, and it is calculated that more than double the quantity of wheat has now been sown compared with the same time in 1852, during the latter portion of which, so completely saturated was the soil, that it was found impossible to complete the usual sowings. In the spring of this year, the same difficulty was experienced; and the result has been an unusually short crop, which has had the effect of raising the quotations, and making us more dependent upon foreign supplies. The future value of wheat must, of course, now mainly depend upon the ability of the continental and other growers to increase their export trade; but it is very clear that heavy importations will be required here, between this and the next harvest, to meet consumption. As yet, however, the inroads upon the stock of new wheat have been comparatively small—the weekly sales showing a decided deficiency in the transactions—and it is understood that the supply of old is certainly in excess of last year. The deficiency in the growth of wheat in France and other quarters induces some holders to look forward to a much higher value for wheat, especially as large orders are expected from the continent, when the shipping season in the Black Sea is over. Barley is turning out a heavy crop. The supplies shown have been in good condition. As they have exceeded the demand, prices have given way. As regards oats, beans, and peas, their yield is unquestionably large; yet we are not prepared to say that any material fall will take place in the quotations, owing to the small supplies expected from abroad.

Nearly the whole of the potato crop has now been raised. The growth in almost every instance is a large one as to quantity; but the losses by disease are unusually extensive. The shipments from Ireland and Scotland have been very large; whilst the arrivals into London from the continent have exceeded 3,000 tons—about 500 being from Sweden, being the first importation of this nature from that quarter. For the most part, the Irish potatoes have turned out good in quality. Some of them have realized 120s. per ton, a price calculated to induce further shipments. The carrot and turnip crops have turned out exceedingly large.

The fat stock markets have been well supplied, although, in many instances, both beasts and sheep have carried a small quantity of internal fat. In France and Holland, prices continue to rule high. Large purchases of beasts have been effected in Spain on French account; but as yet very few transactions have taken place in Holland for the same destination.

The imports of foreign grain and flour into the United Kingdom have been extensive, considering the competition abroad for supply. There appears to have been a slight increase in the stocks held at the large outports; but it is not sufficiently large to have much influence upon prices.

There has been a steady, but by no means large, business doing in corn in Ireland and Scotland. Prices have ruled very firm, with a tendency to advance. The shipments of grain to England have increased.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although the supplies of fat stock on sale in most of the leading markets have been seasonably good, a full average business has been transacted in them, and prices have been well supported. In the early part of the month, the general quality of both beasts and sheep exhibited in Smithfield was inferior; but, towards its close, the weight and condition of most breeds improved to some extent. However, it is generally stated that the produce of rough fat is smaller than for some years past. This circumstance has, as a matter of course, tended to lessen the profits of the butchers, and, at the same time, to produce much excitement in the tallow trade.

The number of beasts upon most farms in this country is represented as a full average; but it is well understood that the aggregate supply of sheep, notwithstanding the small receipts in the large consuming markets during the whole of the present year, is still limited. Evidently, the breeders are now getting very large profits; but the present high value of linseed and cakes, and the prospect of an increased range during the winter months, must tell much against any positive improvement in their present condition. The quality of the hay grown this year is turning out exceed-

ingly bad; consequently, more cake and other food will be consumed than usual. On the whole, the stock has suffered less from disease than we almost ever remember. As regards future prices, we may observe that some persons are of opinion that on the setting in of frost on the continent, and when, as a matter of course, the shipment of stock will be nearly or quite stopped, the quotations will take a rapid start; but it must be understood that we shall be in a much better position as regards home supplies, in other words that those for Christmas consumption are invariably large—too large, indeed, to admit of heavy purchases of lean animals from abroad, which, at such times, rarely find purchasers without difficulty. From inquiry, we find that very large numbers of prime beasts will be received in the metropolis next month; but it is just possible that those of sheep will exhibit a falling off.

The imports of foreign stock have been considerably in excess of last year at the same time. Amongst them have been several cows in milk from Holland, and some wretched oxen from Sweden. On the whole, however, the sheep have shown a decided improvement over some former periods. The following are the imports into London:—

	Head.
Beasts	7,390
Sheep	22,565
Calves	1,629
Pigs	919

COMPARISON OF IMPORTS.

Nov.	Beasts.	Sheep.	Calves.	Pigs.
1852	3,102	18,152	1,215	427
1851	6,279	22,866	1,409	1,127
1850	5,928	17,662	1,058	1,486
1849	4,228	14,204	618	409
1848	3,488	13,424	669	—
1847	3,486	16,213	667	41

At the outports, the arrivals have fallen off; annexed are the total supplies of English, Scotch, and foreign stock shown in Smithfield:—

	Head.
Beasts	25,760
Cows	562
Sheep	127,150
Calves	2,615
Pigs	2,790

COMPARISON OF SUPPLIES.

	Nov.1849.	Nov.1850.	Nov.1851.	Nov.1852.
Beasts	19,388	19,896	23,583	23,063
Cows	342	419	435	462
Sheep	120,060	120,206	115,770	108,975
Calves	1,113	1,475	1,718	1,958
Pigs	2,116	2,872	3,210	2,669

The range of prices has been as under:—

Per 8 lbs. to sink the offals.

	s.	d.		s.	d.
Beef, from	2	6	to	4	6
Mutton	3	0		5	2
Veal	3	4		4	8
Pork	3	4		4	10

During the same month, in 1852, beef sold at from 2s. to 4s.; mutton, 2s. 6d. to 4s. 6d.; veal, 2s. 8d. to 4s. 4d.; pork, 2s. 8d. to 4s. per 8 lbs.

The bullock droves from Lincolnshire, Leicestershire, and Northamptonshire have amounted to 11,150 short-horns. From other parts of England, 1,800 of various breeds have come to hand. The Scotch supply has been only 98 head.

Very large supplies of country-killed meat have been disposed of in Newgate and Leadenhall. Prices have been firmly supported. Beef has sold at from 2s. 6d. to 4s.; mutton, 2s. 10d. to 4s. 8d.; veal, 3s. 4d. to 4s. 6d.; pork, 3s. 4d. to 4s. 10d. per 8 lbs. by the carcase.

SOUTH YORKSHIRE.

The weather of the present month, up to the last six or seven days, has been of the most favourable character for all farming operations, and has enabled out-door work to be prosecuted without hindrance. A severe frost has, however, latterly prevailed, and although at the time we write the land is unprotected by a covering of snow, no serious result has yet occurred to the growing wheat plant. The exceedingly fine weather at the commencement of November allowed of the full sowing of wheat, and at no former period do we remember to have seen so large a breadth of land devoted to the growth of this plant. Its present high price, and the fact that a large quantity of land was last year thrown out of regular course, furnish the reasons for this addition. So far it has generally come up well, and looks exceedingly healthy. In some places, especially upon heavy soils, we have heard of a decided want of plant, although there had been no want of seed; and on examination, it has been found that it had been devoured by the grub. Stackyards look thin, especially of wheat; and it is not uncommon in the strong-land districts to see five of beans to one of the former. Beans are undoubtedly a very large crop; but, with the exception of Michaelmas-sown, they have been gathered in soft condition, and it is not possible for them to come to market any way saleable for some time. As threshing proceeds, the yield of wheat becomes known with more certainty; and, from all we hear, the decrease is full one-third less than an average. Of barley there is not the same complaint. The frost has placed a sudden check upon the growth of turnips, which we find to strip less in weight than was at first supposed; had it not been for the fine weather to which we have alluded, the loss would have been very much aggravated, since from it the bulb was enabled to grow to a period much longer than might have been anticipated. With this diminished produce store stock have, nevertheless, of late sold exceedingly well. At York, Doncaster, and Bawtry fairs, we never saw good cattle in better demand, and with a good inquiry for fat, it is only reasonable to hope that their winter feeding will be attended with profit. If beasts have made more money, we do not believe such is the position of sheep, the sale of which must be regarded as stationary. The price of wheat still continues to range above 10s. per bushel, and there certainly seems no prospect of any abatement for some time to come. Much will depend upon the appearance of the crops next spring, and until then it is extremely doubtful that it will decrease in value, although a variety of circumstances may operate in favour of an increase.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ABERGAVENNY FAIR.—There were no less than 1,000 beasts in the fair; there were also 1,500 sheep, and from 60 to 80 Pigs penned, for which, had a moderate price been asked, there would have been plenty of buyers. What stock of all descriptions sold did not realize so much as it did a month ago by at least 10 per cent. It may be recorded that this has been the largest cattle fair that has been known in Abergavenny for years past.

BATTLE FAIR was numerously attended. There was less stock than has been exhibited on some previous occasions. Still what there was met with ready purchasers at high prices.

CHESTER CHEESE FAIR.—The number pitched was but small, a little above 100 tons. The fair was over by eight o'clock in the morning, and not a cheese left. The prices averaged from 55s. to 70s., few being under 60s., and some ranging at 72s. and 74s.

CHESTER FAIR.—Cattle sold at 5½d. to 6d. per lb.; milking beasts, fresh calved, were in demand at good prices; lean stock a little lower; fat pigs were selling well at about 5½d. per lb.; sheep fetched from 6d. to 7d., but not many of a good quality were shown. There were very few good horses shown, the weather being against the fair; but those that were offered met with a ready sale at good prices. The number of beasts in the fair were—cows 556, pigs 582, sheep 430.

CHESTERFIELD FAIR.—The show of cattle was an average one for the season. Purchasers were chiefly customers for milkers and fresh barren young stock; other descriptions heavy sale, at losing prices to the dealers. The show of horses moderate as to number; very few good animals, but those of a useful nature sold at high prices. Very few sheep, and better business done on lower terms. Pigs, heavy sale. A moderate pitch of cheese, several factors' lots; real home-made good cheese from 64s. to 70s. per cwt., inferior considerably lower. Mrs. Adlington, of Calow, who is celebrated for a good article, obtained the highest price in the fair.

DARLINGTON FAIR was very thinly attended by both buyers and sellers; in fact, it may almost be pronounced defunct.

DURHAM FAIR.—There was a large show of all kinds of cattle, and sales were readily effected, though at a slight decline on recent markets. The best milk cows sold for from 12*l.* to 18*l.*, inferior cows from 12*l.* downwards. The inquiry for beasts for turnip feeding was not so active as is generally the case at this period, owing to the failure of the turnip crop and the high price of oilcake and meal; prices varied from 5s. 3d. to 6s. 6d. per stone, according to forwardness of condition and grazing qualities. Young stock for the straw yard met with a ready sale; year-and-half and two-years-old heifers were worth from 7*l.* 10s. to 9*l.* 10s.; best quality, 10*l.*; steers averaged about 7 guineas each. There was a large show of kyloes, but they were all of only middling quality, and many were left unsold; three-years-old Scots heifers were worth 5*l.* to 7*l.*, according to frame, &c.; smaller heifers and bullocks less money, but hardly any of the latter description were sold, dealers not being willing to submit, although comparatively that description of stock is much higher than country beast. There was a large quantity of pigs shown, but very few purchasers. The best quality of quarter-old shots are worth 15s. to 18s; young pigs, eight or ten weeks old, from 7s. 6d.; strong shots 5s. to 5s. 6d. a stone; fat pigs are selling from 5s. 9d. to 6s. 3d. a stone.

DOUNE LAMMAS MARKET, (Wednesday last.)—The show of cattle was fair in point of number, but the quality not so good as exhibited at recent markets. The stock was principally composed of Highland cattle, from north and west. The buyers were not so numerous as we have seen at other markets in this quarter. The weather was rather unpropitious, which had the effect of showing the stock to a very considerable disadvantage. Few heifers: they were in demand; for the stots, all in good condition, prices were fully as good. At the close of the market for cattle, even although there were a short number, a good number were upon the first day unsold. It was allowed that the cattle, upon the whole, were fully higher in price than at recent markets. The fat that appeared would average about 8s. 6d. per Dutch stone. This market was thinly attended; the stock was comprised of two and three-year-old wedders and ewes. The ewes more in request, and brought about 1s. a-head higher than at last market, and a shade higher than at last Falkirk tryst. There were few Englishmen to purchase; but this arose from the fear of the English dealers being so fair in point of numbers; and this arises from the fact of, in some districts of the country, the turnip crops not having come up. The conclusion of the market was stiff; but a tolerable clearance was effected.

FAKENHAM FAIR was not a good one, the supply of stock being smaller than usual. On the first day there was a moderate show of cattle, but a smaller on the second. A good amount of business was done, high prices were asked, and a large portion of the stock sold. The show of sheep was small; hoggets fetched from 20s. to 35s. per head, and ewes 32s. to 44s. Very few horses were on the green, and the show was very poor.

GLOUCESTER MONTHLY MARKET.—The supply of cattle and sheep was very limited, and of an inferior quality. The trade was brisk for good animals, and late prices were fully supported. Beef from 6d. to 6½d.; and mutton from 6½d. to 7d. per lb.

GLOUCESTER CHEESE MARKET.—About 100 tons were pitched. Trade dull, and prices as follows:—Best doubles, 63s. to 68s.; singles, 56s. to 60s.; seconds, 48s. to 52s.; skim, 32s. to 36s. per cwt. A tolerable clearance was effected.

LOCKERBY PORK MARKET.—This was our first market for the season. There were plenty of buyers, and the market was rapidly cleared at prices which have not been realized here for years. There were 120 carcasses exposed, the average price being 6s. 2d. per stone.

LOUTH FAIR.—A large show of store cattle, but the bulk were of inferior quality, and there was an unusually short supply of good young steers from two to three years old, which on account of their scarcity were sold at high prices. The show of fat beasts was not large, and all were sold readily at prices varying from 6s. to 7s. per stone. There was a small supply of sheep, and a great demand for the useful ones, particularly for lambs, which realized from 6½d. to 7d. per lb. There were more horses than usual, most of which were of inferior quality; anything useful for agricultural purposes met with a ready sale at a good price.

MALTON FAIR.—There was a short supply of in-calving cows and heifers, which had good demand, all being sold. A small number of barren heifers and bullocks, of fresh quality, were all cleared away at good prices. Trade was slow for barren cows. A large supply of Irish heifers and bullocks had only limited sale, at low prices. A few north country sheep were shown, but they met with slow demand. A small quantity of Scotch ponies, useful colts, and inferior horses were exhibited, but the business transacted in them was only heavy. A large supply of pigs had heavy sale at about last week's rates. In the shambles we had a good supply of meat, which had fair sale. Beef, 5d. to 7d.; mutton, 5½d. to 6½d.; veal, 6d. to 8d.; pork, 6d. to 7d. per lb. Pork pigs, 6s. 6d. per stone.

MARLBOROUGH FAIR.—There was a short supply of sheep, which found ready purchasers at from 4s. to 6s. per head higher prices than were obtained at Devizes fair; in fact, it was the best fair for sellers that has been held this season. One very prime lot of lambs, belonging to Mr. King, realized 45s. per head. There was a large show of cart colts, which sold readily at prices varying from 30 to 40 gs. each. There were but few beasts in the fair, and not much doing in that trade.

MONMOUTH FAIR.—There was a very large show of cattle in excellent condition, which sold at very high prices. Horses also found a ready sale. Pigs were rather lower than at the last monthly market

REPTON FAIR was well attended. Beef made 5d. to 5½d.; mutton, 5½d. to 6½d. There was a good show of cattle, which sold readily at good prices. Some prime cattle were shown. The sheep pens were well filled. There were but few fat pigs, and those made 9s. 3d. per score. The show of horses was small.

RUGBY FAIR ended on the 22nd inst. The two first days were devoted principally to the sale of first-class hunters and carriage horses. The supply being small, and the demand great, the prices realized were exceedingly high. Thursday and Friday brought a large quantity of draught horses, colts, and yearlings to the fair; the former brought from £60 to £70 each, and the two latter ranged from £25 to £40 each. Although the prices asked were high, great numbers were disposed of. It was remarked that the breed had much improved. The beast fair was very large, exceedingly so. Beef, 5d. to 6d.; mutton, 6d. to 9d. per lb.

SETTLE FORTNIGHTLY FAIR.—We had rather a heavy market for sheep, but only a scanty supply of beef, which was a little dearer than at the last fair. There was no change in the average prices for sheep, but being a heavy show, they were not quite as readily sold.

SHIPSTON-ON-STOUR FAIR.—There was a good supply of mutton and beef, and a large attendance of buyers. Mutton realized from 6d. to 7d.; beef, 5½d. to 6½d. per lb.

TRURO FAIR was well supplied and numerously attended. There was a brisk sale, especially for sheep, of which 916 were penned; and nearly the whole were sold at prices averaging about 6½d. per lb. This is the largest number of sheep that have been sold at this fair for many years. There was also a large supply of bullocks, and a good demand for fat cattle, which averaged about 56s. per cwt. Store bullocks were from 40s. to 45s. per cwt. The cows and calves in the fair were but few in number. There were 286 bullocks sold; and, altogether, a large amount of business was transacted.

YEOVIL FAIR was fully attended with farmers, millers, dealers, and a'l sorts of fair-seekers. The supply of sheep was tolerably good, for there were upwards of 4,000 penned; and a fair number of them changed hands at about the same prices as those that have been obtained at the late fairs. There was a good supply of cow stock, for upwards of 600 were offered, the best of which fetched high prices, but the inferior ones met a dull sale. The number of pigs penned was about 230, but the trade was not over brisk, neither were prices so high as those obtained about a fortnight since. The horse fair was one of the roughest that has been known for many years, for there was scarcely a good animal offered, and therefore but very few of them found purchasers.

YORK FAIR.—We had a plentiful supply of good-bred shorthorned steers, heifers, and west country draped cows, also of horned and polled Scots, Welsh, and Irish, all of which met with fair demand, at prices firm upon past markets, and a good clearance made in them. The horse fair, like its predecessor on the 14th inst., was of a middling character, except for some Irish colts and fillies, from two to four years old, which were of a very useful sort, and met with good sale.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF NOVEMBER.

In our review of the trade for the month now about to terminate, we shall have fewer changes to notice than has been the case in any preceding month since harvest. Nothing has transpired to alter the actual position of affairs. Experience has proved that the estimate taken of the yield of the crop of wheat in the country soon after it was gathered was, on the whole, tolerably correct. If we have erred at all, we have in our previous articles taken somewhat too favourable a view, the yield of wheat from the straw having, as thrashing has been proceeded with, fallen short rather than exceeded expectation; and we have heard of instances where the produce has not given more than half the usual average of former years off the same land. But these are extreme cases; and we are inclined to think that the total yield of the United Kingdom may come up to about *two-thirds* of an average. This deficiency is, however, enormous; and, to cover the same, we shall probably need to import an extra *four millions* of quarters of wheat, which, added to the average imports of good seasons—which have for several consecutive years amounted to from four to five millions—the total required would appear likely to be the extraordinary quantity of eight to nine millions of foreign wheat.

This calculation we do not presume to give as accurate, as, in the absence of statistical returns of the annual produce or consumption of the kingdom, definite conclusions can scarcely be hoped to be arrived at. This is, however, certain, that authorities of deservedly high standing in the trade estimate our wants at a still higher rate. The importations thus far have been on a very liberal scale, but they have fallen short of the probable requirements of the country. In the month ending Sept. 5, we imported 546,924 qrs. of wheat, and 381,611 cwts. of flour; in that ending Oct. 5, 468,467 qrs. of wheat, and 463,543 cwts. of flour; and in the succeeding month, ending the 5th inst., 425,866 qrs. of wheat, and 302,355 cwts. of flour. Taking 4 cwt. as equal to 1 qr. of wheat—which will be near enough for general purposes—we shall have received for the first quarter 1,728,134 qrs. of wheat, which, supposing the importers to continue at the same rate up to next harvest, would give only 6,912,536 qrs.

The probability is, however, that during the next three months the supplies from abroad will be much smaller than they have been for the last quarter. In the natural course of things, we may expect the navigation of the Baltic to become impeded, as usual, during the winter. But even if there should be no severe frost, the great reduction which stocks of old wheat have undergone in that quarter—in consequence of the large shipments which have been made during the autumn to Great Britain, France, and Belgium—would render exports on the same scale impossible, as the new wheat has

not yet come forward in quantities of any consequence ; nor would it be safe to ship the same until it shall have been hardened by an interval of frost, a great portion of the harvest in the north of Europe having been secured in soft condition.

From France, and, indeed, from the southern countries of Europe, the export of grain has been long prohibited, owing to the great deficiency of the yield. It appears, therefore, that we shall have to look to more distant quarters for our supplies. America and the Black Sea are the most probable sources ; and were it not for the extreme scarcity of ships, and the extraordinary high freights, the west and east might render us efficient aid. The latest advices from America state, however, that a sudden start of about 8s. per qr. had taken place in the price of wheat, in consequence of the supplies from the interior having proved inadequate to satisfy the European demand ; it seems tolerably plain, therefore, that to obtain substantial assistance from the other side of the Atlantic, we must be prepared to pay high rates.

At the principal Black Sea ports very large stocks are held ; but these are almost useless, as far as we are concerned, as vessels are so scarce there that freights had, by the last accounts, risen to 24s. 6d. per qr. at Odessa, and 34s. per qr. had been actually paid at Galatz for the United Kingdom. Another impediment to England receiving any large quantity of wheat from thence exists in the fact that France continues to outbid us ; and by far the greater portion of the shipments from the Black Sea have, during the last three months, been for Marseilles.

We have deemed it necessary once more to lay before our readers the extent of our wants, and the difficulties we are likely to have to encounter in providing for the same. This is done with no view to encourage speculation, but simply that our agricultural friends may be put in possession of the real state of affairs, so as to form their own opinion as to the probable future course of prices.

The weather has, on the whole, been favourable since the close of October for out-door labours ; the land has been gradually freed of superfluous moisture, and the night frosts have not been so severe as seriously to interrupt ploughing. An immense amount of work has consequently been accomplished in a satisfactory manner, and farmers have been too closely engaged in the fields to admit of much corn being brought to market. The trade nevertheless exhibited symptoms of weakness in the beginning of the month, and wheat receded 2s. to 3s. per qr. in value at most of the principal provincial markets. This decline has since been nearly recovered, and quotations are now as high as at any previous period. The strikes among the operatives in the manufacturing districts, together with the dearness of bread, may perhaps lessen the consumption ; but thus far there is no evidence of such being the case. The fact is, that there are no cheap substitutes for bread. Meat is dear ; oatmeal is relatively higher than flour, and potatoes are dearer than either of the articles named : bread continues therefore to be used nearly, if not quite, as extensively as in more moderate seasons, and stocks of wheat and flour in granary are, notwithstanding the liberal character of the arrivals from abroad, thus far diminishing.

Though barley has all through the season been bringing very high prices, the deliveries from the growers were until lately by no means free, which led to the belief that the produce of this grain had not turned out so satisfactory in quantity as was believed at harvest time ; we are, however, inclined to think that the barley crop will pay the farmer better this year than any other. A considerable portion was no doubt injured by the wet weather at harvest time ; but all qualities have brought, and are still bringing, high rates ; we are therefore not surprised that growers should have thrashed barley in preference to wheat, and we are inclined to think that they will continue to adopt that course for some time. A moderate reaction in prices of the first-named article may therefore be expected ; indeed, within the last week or two a decline of about 2s. per qr. has taken place at most of the provincial markets. Of old barley there appears to be none remaining in any part of the country.

The oat crop in England has given but a poor return both in quantity and quality, and old stocks are completely exhausted in all parts of the kingdom. Ireland has fared better ; but the late floods have done great damage there to the stacks left in the fields, and, judging from the supplies which have hitherto appeared in the English markets, the quality is far from what might be desired.

The produce of beans and peas would appear to have been over-rated ; and these articles have risen rapidly since the conclusion of harvest.

With regard to potatoes, the usual uncertainty prevails. In some districts the disease is said to have proved very destructive, whilst in others comparatively little harm has, it is stated, been done ; if, however, price is any criterion, great scarcity appears to exist, as this article is selling at very full rates on this side of the channel as well as in Ireland.

On the whole, we much fear that we are about to experience a very dear winter, and that the poorer classes of the community will have to encounter great hardships.

The Eastern question remains in the same state

of uncertainty as for months past. The reports from that quarter are so little to be depended on, that the news given one day as authentic is frequently contradicted the next, and very little is thus far known as to the actual position of affairs. On the whole, the Turks appear to have had the best of the fighting; but such advantages as they have gained rather widens than narrows the probability of an amicable settlement. England and France stand pledged to support Turkey, and there is consequently a possibility, not to say a probability, of these countries being sooner or later involved in the quarrel. To foresee the ultimate result is impossible; but in considering the future, the chances of war ought not to be wholly overlooked.

We trust that the foregoing general remarks may not be altogether without interest to our readers, and shall now proceed to give them our usual report of the occurrences at Mark Lane during the month.

We may commence by stating that the fluctuations have been less violent, and that there has been comparatively little excitement; but that business, on the whole, has been decidedly of a healthy character. The arrivals of wheat coastwise into the port of London have been very small, and the quantity which has come forward by land-carriage from the home counties quite trifling. The town millers have, however, acted with more than ordinary caution; and during the first fortnight the tendency of prices was downwards. The few runs of Essex, Kent, and Suffolk wheat exhibited on the 7th inst., were placed with extreme difficulty, and though prices were not generally quoted lower, buyers managed in most cases to purchase 1s. per qr. cheaper than on that day week. This decline may be regared as moderate, considering that at most of the country markets prices had in the meantime given way fully 2s. per qr. There was no improvement in the demand on the 14th, but factors resisted any further reduction, and since then the tone of the trade has become firmer: indeed, on the 21st the partial decline of 1s. per qr. noticed above was entirely recovered, and we consider prices quite as high now as they were at the close of last month. Good runs of red wheat are worth 74s. to 75s., and fine samples of white 80s. per qr. The weekly average for London, published on Friday last, was 76s. 10d.; and that for the kingdom, published the day before, 72s. 9d. per qr. This will give the best idea of the rates current, and when we take into account the large proportion of inferior qualities of wheat embraced in these returns, the quotations for good runs at Mark Lane appear moderate.

The arrivals of wheat from abroad have been large: during the first fortnight 90,000 qrs. were received, and the supplies since have amounted to about 40,000, making 130,000 qrs. in all. More than the usual proportion has been from Russia, and we have now a larger quantity of that description on the market than any other. A reduction of 1s. to 2s. per qr. was generally acceded to by importers on the 7th instant, and during the succeeding week rather large parcels changed hands at the decline. A large number of country buyers have visited Mark Lane within the last fortnight, with the view of buying foreign wheat, but they have been disappointed at the prices asked, and have consequently not operated so freely as they probably would have done if holders had been a little more disposed to meet their views. A good business has nevertheless been transacted, and the reduction which took place in the early part of the month has been fully recovered. Archangel, St. Petersburg, and Odessa wheat may be classed together. These sorts have sold at, and are now worth, according to quality, from 60s. up to 66s. The finer kinds of Black Sea wheat range from 65s. to 70s., Lower Baltic from 70s. up to 78s., and Danzig from 72s. up to 82s. per qr. Some very fine white American has lately commanded the last named price, the weight being very heavy, and those millers who have tried this description speak highly of its mealing properties. It is difficult to arrive at anything like a correct estimate of the stock of foreign wheat in warehouse in London. The most generally-received computation is 400,000 to 500,000 qrs.—a large quantity, but not very formidable, if we should be called upon to provide for a wide circle of country; and, judging from the regular visits of buyers from different parts of the kingdom, there appears a strong probability of large drafts being made on our resources. As there has been very little disposition to enter into speculative investments, the transactions in floating cargoes have been less extensive than last month; the high pretensions of sellers has also been against extensive transactions, and the operations in Black Sea wheat on passage have been more trifling than in any preceding month for a considerable time past. The arrivals off the coast have been quite unimportant, and some of those that have come forward have been taken for the continent. The offers of wheat free on board at Baltic ports have for the most part been at too high rates to allow of sales being made: for good red wheat as much as 75s. to 76s., and for fine Danzig 76s. to 78s. per qr., cost and freight, has been asked.

Quotations of town-manufactured flour have undergone no change since our last. In the early part of the month the sale was rather slow, but within the last week or two the inquiry has im-

proved, and we are inclined to think that the millers have worked up their stocks pretty closely. The arrivals of country flour have not been large, and previous rates have been steadily supported. The supplies from America have fallen materially short of expectation, and the quantity of good quality remaining in warehouse is insignificant. The heaviness which prevailed in the wheat trade in the beginning of the month has some influence on American flour, but good brands were at no time offered below 40s., and for superior Baltimore 42s. per brl. has lately been paid. Prices are, and have for some time been, considerably higher in the London market than at Liverpool; the consequence of which will probably be, that a larger share of the consignments from the other side of the Atlantic will be directed to this market than usual.

The arrivals of home-grown barley have increased since our last, and the demand having rather slackened, factors have had to give way in prices. The turn was already in favour of the buyer the first Monday in the month; on the 14th inst. a decline of 1s., and on the 21st a further fall of 2s. per qr. took place, without inducing the maltsters and distillers to take more than they required for immediate use. Since then the trade has been slow, but no further abatement has been submitted to. Foreign barley has come sparingly forward, and grinding qualities have been in steady request throughout the month. The market is quite bare of good Danish and similar sorts, and 52 to 53lb. quality could not at present be bought below 36s. to 37s. per qr. Egyptian, partially damaged, has been sold at 28s. to 30s. per qr., and it is now difficult to be obtained at the last named rate.

The decline in the finer kinds of barley has, as usual, had some influence on the value of malt, and quotations are 1s. to 2s. per qr. lower than they were at the close of last month.

The supplies of oats from our own coast have been quite insignificant; and until last week the arrivals from Ireland were small, but since then some increase has taken place in the latter. From abroad we have received a fair quantity for the time of year, principally from Russian and Dutch ports. The fluctuations in prices have not been of much importance, and the trade, though firm, has not been lively. The large dealers have conducted their operations with extreme caution, under the impression that they might be able to buy somewhat lower; but, with the exception of a fall of about 6d. per qr. in the early part of the month, and which was almost immediately afterwards recovered, prices have not given way. Indeed Russian oats are actually dearer at present than they were at the close of October, good Archangels having lately brought 26s., and fine 27s. to 28s. per qr. The new English are generally of light weight, and a good deal discoloured by weather; the lightest sorts, weighing 35 to 36lbs. per bush., have been sold at 24s. to 25s., and the finer kinds 26s. to 28s. per qr. The new Irish have come to hand in very soft condition; dry parcels have brought 28s. up to 30s., but the damp samples have been difficult of disposal at 1s. to 2s. per qr. less money. The new Scotch oats are well spoken of, but the small lots which have hitherto appeared have hardly sufficed to allow of an opinion being formed in regard to quality. Fine old Scotch feed have realized the high price of 36s., and even 38s. per qr.

The arrivals of beans have not kept pace with the demand, and a material advance has consequently taken place in the value of the article. The upward movement has, no doubt, been greatly assisted by the fact that the export from Egypt has been prohibited. Fine old English beans are now worth 58s. to 60s., and new from 45s. to 50s. per qr. Egyptians have risen very nearly 10s. per qr. in the space of five or six weeks.

Several cargoes of white peas having been received, and a few lots of home-growth having besides come forward, the extreme rates current in October have not been maintained. English boilers, such as would have brought 70s. in the early part of the month, have latterly been offered at 65s. per qr. without meeting with much attention; and foreign, capital breakers, may be had at present at 60s. per qr. We are now approaching the time of year when the consumption of peas is usually the greatest, and it is therefore possible that prices may again take a start. In the value of grey and maple no change has occurred.

There has been much less doing in floating cargoes of Indian corn than in ordinary seasons at the corresponding period of the year. The demand on Irish account has been comparatively trifling, and, if we had received anything like the usual supply, prices would in all probability have given way. So small, however, have been the arrivals off the coast, that, with a greatly circumscribed demand, hardly a single parcel is left undisposed of. Prices have consequently moved up, notwithstanding the want of activity in the inquiry.

We have already made some allusion in the foregoing part of this article to the position of the grain trade at some of the foreign markets; we shall, nevertheless, adopt our usual plan, and finish by giving the substance of the most recently received advices from abroad.

The weather in the north of Europe appears to have been similar to that experienced here—dry and cold, but no frost of consequence. Farmers have, consequently, been enabled to get their autumn

seed in under favourable circumstances; and, if the seasons should prove propitious, we might easily see very low prices after harvest next year. Meanwhile, the reports of the generally unsatisfactory result of the last crop in Germany and Lower Poland are fully confirmed, and stocks of old being almost everywhere reduced into a very small compass, there is not much prospect of prices giving way at present, more especially as the wants of Great Britain and France are rather exaggerated than under-rated by the Baltic merchants.

From Danzig we learn that, in addition to the English and French orders for the purchase of wheat, several parcels had been bought for shipment to Belgium, and that the supplies had hardly sufficed to meet the demand for inferior qualities of new, weighing only 58lbs., equal to 61s.; for good mixed, of 61lbs. weight, 66s.; and for fine high-mixed, 69s. 6d. per qr., free on board, had been paid. Vessels were very scarce; one had been taken up for Dunkirk at 6s. per qr. freight, one for Hull at 4s. 9d., and one for Perth at 4s. per qr.

From Stettin we have letters dated the 22nd inst. Supplies of new wheat had come forward sparingly, and that which had been received had proved of only moderate quality. Good red wheat, 61 to 62½lbs. weight, was then quoted 65s. per qr., free on board; Pommeranian barley, of 52lbs., 35s. per qr.

From Rostock we learn, under date of the 22nd inst., that holders of wheat had shown rather more disposition to realize; fine qualities had, however, not been offered below 69s. 6d. per qr., free on board.

The advices from the other lower ports are of a similar character. Old stocks seem to be nearly exhausted all over the continent; and, from what we have hitherto learned, we are not induced to take a very high estimate of the quality of the new.

In France prices of wheat have of late rather receded; but there can be no doubt that the wants of that country are very great, and that importations on a large scale will continue to be required right up to harvest.

At Marseilles, nearly 300,000 qrs. of Black Sea wheat had been received in the course of little more than a week; this had caused a temporary depression, but Polish Odessa wheat—after having been as low as 53s.—had again rallied to 60s. per qr.

From the Black Sea we learn that purchases had been made at Galatz and Odessa for account of the Neapolitan Government at full terms, but that comparatively little was being shipped to British ports. At Odessa, Polish wheat had realized 39s. to 42s. 6d. per qr., free on board, according to quality. Vessels were exceedingly scarce, and freights high.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter			
Wheat, Essex and Kent, white	68 to 70	fine	75	82
Ditto ditto new	65 70	fine	75	82
Ditto ditto red	62 68	„		75
Ditto ditto new	61 70	„		75
Norfolk, Lincoln. & Yorksh., red	60 68	„		74
Barley, malting, new	41 43	Chevalier	43	46
Distilling	34 36	Grinding	31	35
Malt, Essex, Norfolk, and Suffolk, new	64 65	extra		67
Ditto ditto old	64 65	„		65
Kingston, Ware, and town made, new	68 70	„		70
Ditto ditto old	66 68	„		69
Oats, English feed	25 27	Potato	27	30
Scotch feed	28 33	Potato	33	35
Irish feed, white	26 27	fine		28
Ditto, black	23 25	fine		26
Rye	36 40	old	—	—
Beans, Mazagan	41 43	„	47	50
Ticks	43 45	„	48	52
Harrow	45 47	„	50	54
Pigeon	46 50	„	54	60
Peas, white boilers 63 65. Maple 44 47		Grey	41	44
Flour, town made, per sack of 280lbs.	— —	„	70	75
Households, Town 55s. 65s. Country	—	„	59	65
Norfolk and Suffolk, ex-ship	— —	„	57	60

FOREIGN GRAIN.

	Shillings per Quarter			
Wheat, Dantzic, mixed	68 to 72	high mixed	76	78 extra 80
Konigsberg	66 68	„	70	73 „ 75
Rostock, new	68 71	fine	73	„ 76
Pomera., Meckbg., and Uckermk., red	66	68 extra		71
Silesian	„ 66	68 white	68	74
Danish and Holstein	„ 66	68 „	68	73
Rhine and Belgium	„ —	— old	—	—
Odessa, St. Petersburg and Riga	58 60	fine	62	64
Barley, grinding 33 36		Distilling	34	38
Malting		none	—	—
Oats, Dutch, brew, and Polands 27s., 29s.		Feed	24	27
Danish & Swedish feed 27s. to 29s.		Stralsund	29	30
Russian	25 26	French	24	25
Beans, Friesland and Holstein			44	48
Konigsberg	47 50	Egyptian	46	50
Peas, feeding	50	55 fine boilers	55	60
Indian Corn, white	37 42	yellow	37	42
Flour, French, per sack (none)	— —	none	—	—
American, sour per barrel	33 35	sweet	38	42

IMPERIAL AVERAGES.

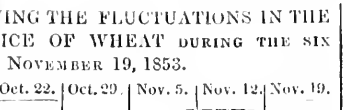
For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
Oct. 15, 1853	68	4	40	1	23	10	39	11	45	8	45	4
Oct. 22, 1853	68	11	40	7	24	2	38	4	45	7	50	7
Oct. 29, 1853	69	1	40	9	24	8	40	10	48	4	51	10
Nov. 5, 1853	71	9	41	3	25	5	43	0	48	10	53	3
Nov. 12, 1853	73	7	42	2	25	5	42	7	49	9	56	7
Nov. 19, 1853	72	7	42	3	26	0	43	11	52	6	56	7
Aggregate average of last six weeks	70	9	41	2	24	11	41	5	48	6	52	4
Comparative avge. same time last year	39	2	29	4	18	2	27	4	34	10	31	11
Duties	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Friday's Av. s.	d.	Averages from the corresponding *Gazette* in 1852.	Qrs.	Av. s.	d.
Wheat	65,173	72	7	Wheat	96,792	40	
Barley	98,943	42	3	Barley	107,394	30	6
Oats	15,100	26	0	Oats	21,509	18	9
Rye	236	43	11	Rye	94	29	9
Beans	4,497	52	6	Beans	5,229	35	0
Peas	2,386	56	7	Peas	3,332	33	2

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING NOVEMBER 19, 1853.



PRICES OF SEEDS.

Very high prices were asked for Cloverseed. Canary-seed was easier to buy. Other articles unaltered.

BRITISH SEEDS.

Linseed (per qr.).. sowing 60s. to 64s.; crushing 48s. to 54s.
Linseed Cakes (per ton)..... £9 10s. to £10 10s.
Rapeseed (per last)..... £30 to £34
Ditto Cake (per ton)..... £6 15s. to £7 5s.
Cloverseed (per cwt.)..... (nominal) .... 00s. to 00s.
Mustard (perbush.) white new 14s. to 16s., brown old 10s. to 13s.
Coriander (per cwt.)..... new 10s. to 13s., old 10s. to 15s.
Canary (per qr.) ..... 64s. to 70s.
Tares, Winter 7s. 6d. to 8s. 0d.. Spring, per bush., (none)
Carraway (per cwt.)..... new 42s. to 44s., old 44s. to 48s.
Turnip, white (per bush.)..... Swede (nominal.).....
Trefoil (per cwt.) ..... 22s. to 26s.
Cow Grass (per qr.) ..... (nominal) .. 00s. to 00s.

FOREIGN SEEDS, &c.

Linseed (per qr.).... Baltic, 45s. to 48s.; Odessa, 53s. to 55s.
Linseed Cake (per ton)..... £9 10s. to £10 10s.
Rape Cake (per ton)..... £6 15s. to £7 5s.
Hempseed, small, (per qr.) 33s. to 35s., Do. Dutch, 37s. to 38s.
Tares (per qr.) .... old, small 30s. to 36s., large 36s. to 42s.
Rye Grass (per qr.) ..... 28s. to 35s.
Coriander (per cwt,) ..... 10s. to 13s.
Clover, red..... 66s. to 96s
Ditto, white ..... 58s. to 78s.

Linseed continues steady, at full prices. Black Sea, ex ship, 53s.; mid. Calcutta, 53s.; Archangel, 44s.; and Riga, 42s. per qr. Cakes command extreme rates.

HOP MARKET.

BOROUGH, MONDAY, NOV. 28.

The inactivity usual at this period continues to prevail in our market; but prices remain firm, as holders evince no disposition to press their hops on sale. HART & WILSON.

The Imports of Hops into London last week were:—611 bales from Hambro,' 236 do. from Antwerp, and 292 from Ostend.

HOPS.—A correspondent of the *Sussex Express*, who signs himself a "Looker On," writes as follows: "The general disposition of the grower of hops is to hold for a better market than at present—the trade at this time being dull, as is usually the case at the end of November—and it is not improbable that it may remain so for a short time; but, from the fact of the country and the consumers generally having scarcely any stock on hand, an unprecedented demand is fully expected, and the knowledge of the quantity on hand having at no time since 1817 been so small as now, gives confidence to the holders, and they well know, when there is so much vermin in the previous autumn as last September, that hops seldom escape a considerable blight; it is needless to say what the effect of a small crop or half a crop would be next year—doubtless the great consumer does not fail to notice it, and, if he can find the market easy, would not fail to take the opportunity, very properly, of nursing his stock, though at a higher price than in the years of great plenty. A very short crop would yield extravagant prices despite all the foreign hops, good, bad, or indifferent. The brewers and some others have had their meetings, to hold off the market as long as they can. This may induce the growers to do the same."

POTATO MARKETS.

SOUTHWARK WATERSIDE.

MONDAY, NOV. 28.

During the past week there has been a very large number of arrivals, both coastwise and from the Rhine, and trade is much depressed: the larger proportion of cargoes in very bad condition.

The following are this day's quotations:—

	£	s.	£	s.
East Lothian Regents	100	0 to	130	0
Perthshire ditto	70	0 —	100	0
Forfarshire ditto.....	70	0 —	100	0
Fifeshire ditto.....	70	0 —	100	0
Reds and Cups	50	0 —	90	0
Rhenish whites.....	50	0 —	80	0

BOROUGH AND SPITALFIELDS, NOV. 28.

Coastwise the arrivals of potatoes continue good. The imports last week were large—viz., 140 tons from Stavenger, 1,200 from Rotterdam, 350 from Gothenburg, 4 from Hambro', 40 from Uddevalla, 1 from Marseilles, 320 from Dordt, 4 from Cork, 190 from Dublin, 10 from Waterford, and 90 from Belfast. Our markets are dull, as follows: Scotch, 75s. to 145s.; Irish, 95s. to 105s.; foreign, 90s. to 140s.; Essex and Kent qualities, 100s. to 160s. per ton.

ENGLISH BUTTER MARKET.

Nov. 28.

We note a depressed trade, and prices of all except really best qualities of Butter are giving way.

Dorset, fine weekly	106s. *to* 110s. *per cwt.*
Do., middling	90s. *to* 98s. ,,
Devon	96s. *to* 100s. ,,
Fresh, per dozen lbs......	11s. *to* 14s.

BELFAST, (Friday last.)—Butter: Shipping price, 95s. to 100s. per cwt.; firkins and crocks, 10d. to 10½d. per lb.; Bacon, 54s. to 58s.; Hams, prime, 70s. to 76s. per cwt.; mess Pork, 85s. to 87s. 6d. per brl.; beef, 110s. to 112s. 6d.; Irish Lard, in bladders, 66s. to 70s.; kegs or firkins, 64s. per cwt.

Nov. 24.	*Butter, per cwt.* s. d.	s. d.	*Bacon, per cwt.* s. d.	s. d.	*Dried Hams, per cwt.* s. d.	s. d.	*Mess Pork per brl.* s. d.	s. d.
1849..	68 0	72 0	44 0	50 0	60 0	84 0	65 0	67 6
1850..	74 0	80 0	38 0	44 0	60 0	62 0	56 0	58 0
1851..	77 0	84 0	45 0	47 0	60 0	62 0	58 0	62 0
1852..	76 0	82 0	50 0	54 0	64 0	66 0	72 0	75 0
1853..	95 0	100 0	54 0	58 0	70 0	76 0	85 0	87 6

PRICES OF BUTTER, CHEESE, HAMS, &c.

	s.	s.		s.	s.
Butter, per cwt.			*Cheese, per cwt.*		
Friesland ..... ,,	104	to 108	*Cheshire, new*....	60	to 76
Kiel..... ,,	104	106	*Cheddar*	66	80
Dorset.....*new*	106	114	*Double Gloucester*	60	70
Carlow..... ,,	98	102	*Single do.* ..	64	70
Waterford .. ,,	94	98	*Hams, York*	88	98
Cork ..... ,,	94	98	*Westmoreland*..	86	96
Limerick .... ,,	90	94	*Irish*	74	84
Sligo ..... ,,	90	96	*Bacon, Wiltshire, green*	60	64
Fresh, per doz. 13s. 6d.	15s. 0d.		*Waterford*	60	61

HIDE AND SKIN MARKETS.

SATURDAY, NOV. 26.

Hides and skins have been in good supply, and steady demand. The latter continue to advance in price.

			s.	d.	s.	d.	
Market Hides, 56	*to* 64	*lbs*.....	0	2½ *to* 0	2¾	*per lb.*
Do. 64	72	*lbs*.....	0	2¾	0	0	,,
Do. 72	80	*lbs*.....	0	2¾	0	3	,,
Do. 80	88	*lbs*.....	0	3	0	3½	,,
Do. 88	96	*lbs*.....	0	3	0	3½	,,
Horse Hides.....			6	6	0	0	*each.*
Calf Skins, light			2	6	3	6	,,
Do. full			6	0	0	0	,,
Downs			3	9	4	9	,,
Polled Sheep.....			6	3	7	6	,,
Kents and Half-breds.....			5	8	6	0	,,

WOOL MARKET.

BRITISH WOOL TRADE.

MONDAY, Nov. 28.

Since our last report, there has been a slight improvement in the demand for fine English wools, at full prices. All other kinds have sold slowly, at the late decline in the quotations.

	s.	d.		s.	d.
South Down Hoggets	1	4	*to*	1	6
Half-bred ditto	1	3	—	1	5
Ewes, clothing.....	1	1	—	1	3
Kent fleeces.....	1	1	—	1	3
Combing skins.....	1	0½	—	1	4
Flannel wool	1	0	—	1	5
Blanket wool	0	8	—	1	0
Leicester fleeces.....	1	2	—	1	4

LIVERPOOL WOOL MARKET, Nov. 26.

BRITISH WOOL.—There is an increasing demand for English and Scotch wools. Prices have a firmer tone, and any change is rather in favour of the seller.

		s.	d.	s	d.
Laid Highland Wool, per 24lbs.....		13	6 *to* 14		6
White Highland do.....		17	0	18	0
Laid Crossed	*do..unwashed*	18	0	19	0
Do.	*do..washed*	19	0	21	0
Laid Cheviot	*do..unwashed*	20	0	23	0
Do.	*do..washed*	23	0	26	0
White Cheviot	*do .. .. do*.....	30	0	32	0

FOREIGN WOOL has been in good request, and sales to a fair extent have taken place in all kinds at full prices.

FOREIGN WOOL MARKETS.

The market has ruled quiet since the public sales, but firm. The following are the prices of various foreign descriptions:—

UNITED STATES.—Fine Merino fleece, clean 1s. 10d. to 2s., inferior, washed 1s. 6d. to 1s. 8d., half-bred, clean 1s. 6d. to 1s. 10d., inferior, washed 1s. 3d. to 1s. 4d., coarse to first cross, clean 1s. to 1s. 3d., inferior washed 10d. to 1s., slipe and skin, first quality 1s. 8d. to 1s. 10d., second 1s. 2d. to 1s. 5d., third 10d. to 1s., Southern States, clean 8d. to 1s. 2d., unwashed 5d. to 7d. per lb.

SPANISH.—Leonesa, R. 1s. 9d. to 1s. 10d., F. and S. 1s. 6d. to 1s. 7d., A. 1s. 6d. to 1s. 8d.; Segovia, R. 1s. 6d. to 1s. 8d., F. and S. 1s. 3d. to 1s. 4d., A. 1s. 3d. to 1s. 6d.; Soria and Seville, R. 1s. 3d. to 1s. 6d., F. and S. 1s. to 1s. 2d., A. 1s. 1d. to 1s. 4d.; unwashed, various 6d. to 10d.; washed mountain, 10d. to 1s. per lb.

PORTUGAL.—Lisbon, R. 1s. to 1s. 1d., F. and S. 9d. to 11d., A. 9d. to 10½d., unwashed 5d. to 7d.; Oporto, washed fleece 9d. to 9½d., yellow and locks 6d. to 7½d., unwashed 4d. to 4½d. per lb.

BUENOS AYRES AND MONTE VIDEO.—Merino, washed and free from burr 1s. 2d. to 1s. 8d., washed burry 10d. to 1s. 1d., unwashed 6½d. to 7d.; Mestizo, washed and free from burr 1s. to 1s. 2d., washed burry 8d. to 11d., unwashed 5d. to 6½d.; common, washed and free from burr 7½d. to 8d., washed burry 5d. to 6d., unwashed 2d. to 3d.; Cordova, washed 8d. to 8½d., unwashed 4½d. to 5d. per lb.

PERUVIAN.—Washed fleeces 10d. to 1s., extra 1s. 1d. to 1s. 3d.; washed skin 6½d. to 8d., extra 9d. to 10d.; unwashed fleeces 6½d. to 7d., extra 7d. to 7½d.; unwashed skin 5d. to 6d., extra 6d. to 7d. per lb.

ALPACA.—White 2s. 4d. to 2s. 6d., colours 2s. 4d. to 2s. 6d., locks and lambs' 9d. to 1s.; Vicuna 3s. to 3s. 3d. per lb.

CHILIAN.—Washed, fine and half-bred 8d. to 1s., common 4d. to 6d.; unwashed, fine and half-bred 6d. to 8d., common 3d. to 4d. per lb.

EAST INDIA AND PERSIAN.—First white 10d. to 11½d., second and coarse 8d. to 10d.; first yellow 8d. to 10d., coarse 5 d. to 7d.; fine grey 6d. to 8d., coarse grey and burry 3d. to 4d. per lb.

LIMA.—Unwashed, fine fleece 7d. to 8d., common and burry 3½d. to 5d. per lb.

MEDITERRANEAN.—Italian—merino fleece 1s. 2d. to 1s. 6d., common ditto 10d. to 1s., merino lambs' 1s. 2d. to 1s. 6d., common 8d. to 1s., skin 9d. to 1s. 1d.; Egyptian, white 10d. to 11d., yellow 9d. to 10d., brown and grey fleeces 7d. to 8d., locks and lambs' 5d. to 7d.; Mogadore, fine washed 9d. to 10d., low ditto 7d. to 8d., locks 6d. to 7d., skin 6d. to 9d., unwashed 3½d. to 5d.; Tunis, washed 6d. to 7d., unwashed 3d. to 3½d.; Vidino, Scopia, and Albanian, fine 8d. to 9d., coarse 6½d. to 7½d.; Bosnia and Servia, fine and half fine 8d. to 9d., long coarse 6½d. to 7½d.; Scutari and Scopia lambs' 7½d. to 8d.; Grecian washed 6½d. to 7d., unwashed 3½d. to 4½d.; Syrian washed, white 6d. to 7½d., grey 5d. to 6d., unwashed 3d. to 4d.; Smyrna washed first quality 8d. to 8½d., second 7d. to 7½d., grey 5d. to 6d., skin 4d. to 6d., unwashed 3d. to 4½d.; Mohair 1s. 8d. to 1s. 10d. per lb.

RUSSIAN.—Merino fine 1s. 6d. to 2s. 4d.; Metis 1s. 4d. to 2s., brook-washed 1s. to 1s. 10d.; Donskoi 8d. to 9d., lambs' 8½d. to 9½d., autumn 7½d. to 8½d.; Zegai, first quality 1s. to 1s. 3d., second 11d. to 1s. 1d., third 9d. to 11d.

OILS.

	£	s.	d.		£	s.	d.
Olive, Florence half-chests	1	0	0	*to*	1	1	1
Lucca	0	10	0	..	7	0	0
Gallipoli (252 gallons)	57	0	0	..	66	0	0
Spanish	60	0	0	..	63	0	0
Linseed (cwt.)	1	11	0	..	1	12	0
Rape, Pale.....	2	2	6	..	2	3	0
Brown	2	0	6	..	2	1	0
Cod (tun).....	35	10	0	..	36	0	0
Seal, Pale	38	0	0	..	40	0	0
Ditto, Brown, Yellow, &c.	34	0	0	..	37	0	0
Sperm	86	0	0	..	88	0	0
Head Matter	89	0	0	..	91	0	0
Whale, Greenland.....	34	0	0	..	35	0	0
Southern	39	0	0	..	42	0	0
Cocoa Nut (cwt.)	2	5	0	..	2	6	0
Palm.....	1	17	6	..	2	0	6
WHALEBONE.							
Greenland, full size (per ton).... 190	0	0	..	200	0	0	
South Sea 180	0	0	..	190	0	0	
PITCH.							
British (per cwt.).....	0	7	0	..	0	0	0
Archangel	0	9	0	..	0	0	0
Stockholm	0	10	0	..	0	0	0
TAR.							
American (British)	0	12	0	..	0	0	0
Archangel.....	1	2	0	..	0	0	0
Stockholm.....	0	18	6	..	0	19	0
TURPENTINE.							
Spirits (per cwt.)	2	17	0	..	0	0	0
In Puncheons.....	2	16	0	..	0	0	0
Rough.....	0	14	0	..	0	0	0
RESIN.							
Yellow (per cwt.)	0	8	0	..	0	0	0
Transparent	0	7	6	..	0	0	0

MANURES.

LONDON, MONDAY, Nov. 28.

PRICES CURRENT OF GUANO.

Peruvian Guano	*per ton*	£9	5	0 *to*	£9	10	0
,, *D. first class (damaged)*..	,,	8	10	0	0	0	0
Bolivian Guano	,,	7	10	0	7	15	0
ARTIFICIAL MANURES, OIL CAKES, &c.							
Peat Charcoal	,,	3	0	0	0	0	0
Nitrate Soda	,,	18	0	0	18	10	0
Nitrate Potash or Saltpetre.....	,,	29	0	0	31	0	0
Sulphate Ammonia	,,	15	10	0	17	10	0
Muriate ditto	,,	22	0	0	23	0	0
Superphosphate of Lime	,,	0	0	0	6	0	0
Soda Ash or Alkali	,,	0	0	0	8	0	0
Gypsum	,,	1	15	0	3	0	0
Coprolite.....	,,	3	0	0	3	10	0
Sulphate of Copper, or Roman Vitriol for Wheat steeping....	,,	38	0	0	40	0	0
Salt	,,	1	1	0	1	5	0
Bones ½ inch	*per qr.*	0	0	0	0	15	0
,, *Dust*.....	,,	0	0	0	0	17	0
Oil Vitriol, concentrated	*per lb.*	0	0	1	0	0	0
,, *Brown*.....	,,	0	0	0	0	0	0½
Rape Cakes.....	*per ton*	6	15	0	7	0	0
Linseed Cakes—							
Thin American in brls. or bags	,,	10	15	0	11	5	0
Thick ditto round.....	,,	9	12	6	9	15	0
Marseilles	,,	10	0	0	10	5	0
English.....	,,	10	5	0	10	10	0

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