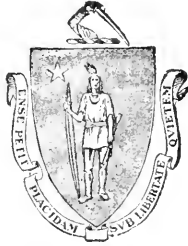


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THE FARMER'S MAGAZINE.

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(THIRD SERIES.)

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INDEX.

A.

Agriculture, approaching Revolution in, 158
 Agriculture, Calendar of, 84, 184, 275, 371, 467, 560
 Agricultural Biography, 301, 392, 521
 Agricultural Geology, 389
 Agricultural Intelligence, 467, 565
 Agricultural Produce, Imports of, 361
 Agricultural Pursuits, Discussions connected with, 529
 Agricultural Queries, 180, 273, 370, 464, 566
 Agricultural Reports, 86, 182, 276, 373, 465, 560
 Agricultural Statistics, 271, 342, 349, 369, 400, 401
 Agricultural Statistics. By Cuthbert W. Johnson, Esq., 381
 Agricultural Statistics of the United States, 538

AGRICULTURAL SOCIETIES—

Basingstoke, 114
 East Cumberland, 444
 East Lothian, United, 125
 West of England, 333

Answers to Agricultural Queries, 90, 273, 370, 464, 566
 Apples, on storing in dry Sawdust, 451
 Averages, Deputation to the President of the Board of Trade on the Subject of taking them, 245
 Averages Imperial, 95, 189, 283, 379, 474, 571
 Averages, London, 95

B.

Barley and Turnips, Preparation for the Seed Time, 292
 Beef, Scotch, the season, *versus*, 459
 Beer-shop Nuisance, 431
 Beans, on the Culture of, 387
 Beridge, the Rev. B., of Algarkirk, testimonial to, 450
 Birmingham Cattle Show for 1853, 65

Birmingham Society, and Premiums for Horses, 238
 Blood as a Manure, 415
 Board of Trade and Poor Law Returns, 361
 Bread, new Process of making, 407, 463
 Butter-making in America, 422
 Butter Market, 96, 190, 284, 380, 475, 571

C.

Cattle feeding.—Mr. Hutton's System, 508
 Cattle, Points by which lean ones are to be judged, 231
 Cattle Rearing and Feeding in Aberdeenshire, 317
 Cattle, the Origin, Distribution, and Improvement of our Breeds, 226
 Cattle-trade, Review of the, 87, 183, 277, 374, 466, 561
 Cattle Traffic per Railway, 507
 Cheese Fairs, 475
 Cheese, Gloucester.—Mr. Hayward's (Frocester Court Farm) Experience as a Cheese-maker in Vale of Berkeley, 487
 Chicory as a Substitute for Coffee, 510
 Chicory, Culture of, 509
 Chicory Market, 96, 284, 475, 571
 Christmas Beef, 11
 Cleveland Horse, Pedigree, &c., 1
 Clay Lands and Loamy Soils, 424
 Clover Failure, the, 251, 321
 Clover-sick Land, 251, 547
 Cookery, the Art of, 252, 294
 Corn Averages, on the, 353
 Corn, comparative Prices and Quantities, 96, 190, 283, 379, 474, 571
 Corn Measures in Hertfordshire, 357
 Corn, Present Prices, Future Prospects, 519
 Corn Trade, Review of the, 91, 185, 279, 375, 469, 567
 Corn Rents, 368, 420
 Couch, Autumn-Cleaning, a Remedy for, 290
 Covent Garden Market, 476
 Currency per Imperial Measure, 95, 189, 283, 379, 474, 571

D.

- Dairy Management—Cheese, 456
 Digging Machine, 415
 Diseases of Horses and Cattle. By W. F. Karkeek, Esq., V. S., 548
 Drainage, arterial, 16
 Drainage, arterial.—Mr. Denton's Plan, 213
 Drainage of London—its Value. By J. Towers, Esq., 100
 Drainage of the Woolwich and Plumstead Marshes; the Rye and Derwent Valley in Yorkshire, and Martin Mere in Lancashire, 31
 Drainage, the Keythorpe System, 34
 Drainade through Subsoil, as applied to dead-level Districts, 152
 Drainage, trunk or arterial. By Philip Pusey, Esq., 82

E.

- Education, industrial, 46, 103
 Epidemics, Town Drainage and Manuring the Land, 298, 445, 540
 Ewes, Management of, 367

F.

- Farm Buildings, on the Ventilation of. By James D. Ferguson, 36
 Farm Horses, on the Improvement of, 334
 Farm Practice, Modern Innovations in, 206
 Farm Sales, Liability of a Guarantee in signing the Sale Book, 369
 Farmer, the thrifty and thriftless, 433
 FARMERS' CLUBS—
 Croydon, 108, 514
 Driffield, 249
 Hadleigh, 355
 Halesworth, 463
 Howden, 320
 London, 17, 23, 240, 342, 408, 493
 Probus, 368
 Winfrith, 354
 Farmers, Important to the, 111
 Farming, Amateur, 151, 215
 Farming, Extremes in, 300
 Fences, Hedge-planting, 208
 Field Carrot, on the Culture of the, 385
 Field Culture, 206
 Fish, artificial Breeding of, 160, 419
 Fish Manure, 312
 Flax, its Cultivation in Yorkshire, 512
 Flax, Hints to Farmers, 556
 Food for the Million, 326, 434, 535
 Fruit and Flowers—how to keep them always fresh, 511

G.

- Gorse, on the Uses of, 42
 Grass cured for Hay by Steam, 399
 Grazing Department of the Farm, 530
 Guano, Breach of Contract—Lang v. Choep, 541
 Guano, British Manures, *versus*, 101
 Guano, Domestic, 464
 Guano Question, the, 272, 300, 314, 332
 Guano Question; Value of refuse Fish as a Manure, 117
 Guano, Substitutes proposed for. By Cuthbert W. Johnson, Esq., 2

H.

- Hay Markets, 475, 571
 Hedges, and Hedge-row Timber, 212, 315
 Hedges Evergreen—the common Laurel, 331
 Hereford Bull, Description of, 381
 Hereford Heifer, Description of, 184
 Hide and Skin Markets, 96, 190, 284, 380, 476, 571
 Homestalls covered, 366
 Hop Culture—the Chalk Districts of Kent, 222
 Hop Market, 96, 190, 284, 380, 475, 571
 Horse Labour—Can the Farmer economise? Employment of Oxen, 49
 Horse, the comparative Powers of the, 258
 Horses, Farm, 264
 Horses for the Chase or Camp, on the breeding of, as a profitable Occupation, 442
 Horses, Resources for breeding, 260

I.

- Irish Agricultural Returns for 1852 and 1853, 172, 441
 Joe Miller, Description and Pedigree of, 184

L.

- Labour, exemplary Employment of, 239
 Lambs with sore Mouths—Ewes with sore Udders, Cure for, 464
 Land? Is it possible to Overdrain, 265
 Linseed Oilcake, Adulteration of, and Suggestion for the Use of Bran with Rape-cake, 233
 Linseed Trade, annual Report of the, 174
 Lucerne, on the Culture of, 417

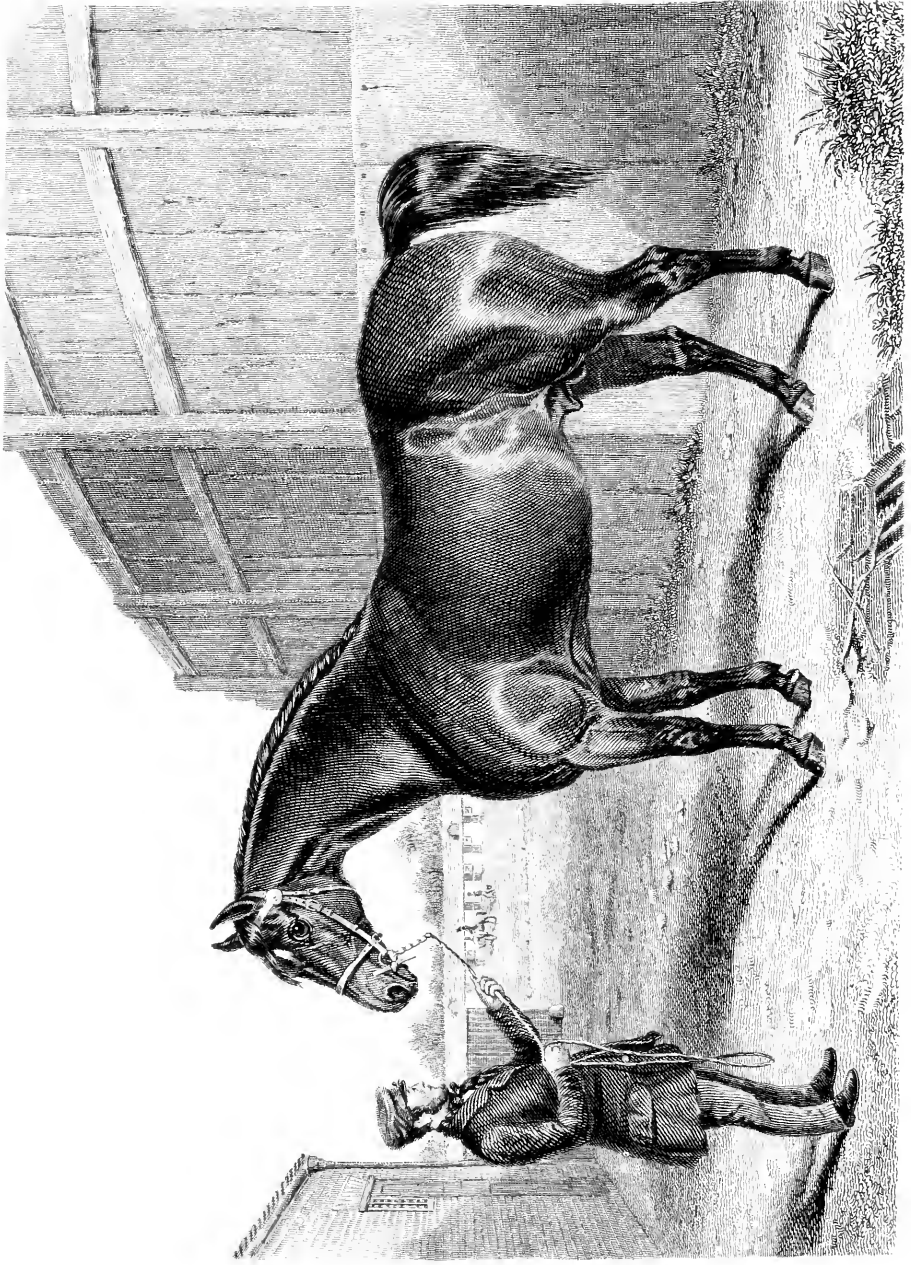
M.

- Maize, Culture of, 112
 Malt, Table showing the Quantity used by London Brewers, 89
 Malt Tax, 532
 Mangold Wurzel, or Field Beet, 113, 446
 Manure Drill, Chandler's Liquid, 449
 Manure, green Crops ploughed in for, 533
 Manure, Farm Yard—its Management and Application, 116
 Manure, its Application to the Soil, 225

- Manures, Formula for estimating the Value of, 566
- Manures, nitrogenous, some late Researches upon. By Cuthbert W. Johnson Esq., 191
- Manures, Prices of, 190, 284, 380, 476, 571
- Mare, a well-bred, 381
- Mechi's (Mr.) Balance-sheet, Tiptree Hall, 73
- Meteorological Diary, 85, 181, 274, 372, 558
- N.
- Nitrogen, manurial Influences of, 502
- Norton and Brodie's illustrated Catalogue, 194
- O.
- Oatmeal, 436
- Oils, Prices of, 476
- Organic Nature, Decay in, 81
- P.
- Pauper Population—who ought to keep them? 325
- Pleuro-Pneumonia, 179
- Political Questions—on their Discussion at public Meetings, 154
- Pond Mud, Use of, 396
- Potato and Vine Disease, 399
- Potato Crop, 556
- Potato Crop. By Cuthbert W. Johnson, Esq., 97
- Potato Disease, 506
- Potato Market, 96, 190, 284, 380, 475, 571
- Poultry, practical Hints about, 520
- Poultry, profitable Farm, 418
- Poultry Show at Newcastle, 515
- Poultry Shows, 53
- R.
- Railway portable, 507
- Rats, to drive away, 566
- Reaping Machine, on Bell's, 367
- Redcar, North Yorkshire, a Harbour of Refuge, 421
- REVIEWS—
- Eveline, a Song, 83
- Rendle's new farming price current and agricultural Directory for 1854, 275
- Rot in Sheep, a Cure, 278
- Royal Agricultural Society of England, 6, 104, 197, 362, 397, 480
- Royal Dublin Society's Spring Cattle Show, 455
- Russia, 322
- S.
- Sanatory Improvements. By Cuthbert W. Johnson, Esq., 477
- Scotch Hind Service, the, 504
- Seeds, prices of, 96, 190, 283, 380, 475, 571
- Settlement, the Law of, 254, 335, 425
- Settlement, the Law of, and Ireland, 293, 416
- Sewage Manure—Adulteration of Guano, 516
- Sheep-skins Mats, Directions to make, 503
- Sheep, the Breeds and Crosses best adapted for Ireland, 526
- Short-horned Heifer, Description and Pedigree of, 557
- Short-horned Stock, Sale at Eden, Aberdeenshire, 563
- Short-horns, the Lenton Sale of, 461
- Silica Strata of the Upper Green Sand, 4
- Smithfield Club; its Object, Importance, and Progress in 1853, 132
- Smithfield Club Cattle Show, 55
- Smithfield Club Cattle Show Dinner, 60
- Smithfield Club Cattle Show, Table of the Weights of the prize Animals, 162
- Smithfield Club Cattle Show. Exhibition of Implements, 163
- Smithfield Great Cattle Market for 1853, 63
- Stallions for the Season, List of, 452
- Statistics, Scottish agricultural, 79
- T.
- Tares, the Culture and Application, of, 253
- Thrashing Machine, the American, 83
- Timber of the Deodar, 555
- Tithe Commutation, 150
- Tithe Commutation Rent-Charges, 115
- Trespass, the Law of, 270
- Turkey, 358
- Turnip Crop, partial Failure in the, 106
- Turnip Crop, the Consumption of, 33
- Turnip Fertilizers. By Cuthbert W. Johnson, Esq., 285
- Turnip Question, the 107
- Turnips, Disease of—Investigation of the Highland and Agricultural Society, 266
- Turnips, Disease of Plants, 311
- Turnips, on the Storing of, 547
- Turnips, Properties of, 491
- Turnips, their Feeding Properties grown with different Manures. By Wm. Goodlet (Premium the Gold Medal), 148
- V.
- Vegetables, the Preservation of, 451
- W.
- Wages, on, 44, 128, 217
- Wales, Prince of, his Age, &c., 1
- War, how will it affect the Agricultural Interest? 297
- Warts on Cattle, a Cure for, 433
- Water—how to clarify it, 464
- West Australian, Winner of the Derby, Description of, 557
- Wheat-sowing, Crop 1854, 28
- Wheat Trade, the, 170
- Woodlands? what shall we do with our, 289
- Wool Market, 96, 190, 284, 380, 476, 571
- Wool Trade, annual Report, 177

THE EMBELLISHMENTS.

	Page
H.R.H. Albert Edward Prince of Wales	1
Cleveland Shortlegs	1
A Hereford Heifer	184
Joe Miller	184
Shropshire Down Shearling Ewes	191
Patent Machinery for Agricultural Purposes, as manufactured by Messrs. Norton and Brodie	194
A Pen of Pigs	285
A Cart Stallion	285
A Hereford Bull	381
A well-bred Mare with Foal at foot	381
Illustration of the Growth of Wheat and Beans	387
A Short-horned Heifer	557
West Australian	557



THE FARMER'S MAGAZINE.

JANUARY, 1854.

PLATE I.

HIS ROYAL HIGHNESS ALBERT EDWARD PRINCE OF WALES.

His Royal Highness Albert Edward Prince of Wales was born on November 9, 1841. He has thus just completed his twelfth year, with every promise of becomingly filling that high position to which he was born. The portrait shows him a fine manly boy, already imbued with those tastes so congenial to his countrymen, and so calculated to increase their regard for him. If the Princes of any State might sit for their pictures on horseback, none surely should sit better or firmer than an English one.

The Prince of Wales is the second in a family which also includes the following members:—The Princess Royal, Victoria Adelaide Mary Louisa, born Nov. 21, 1840; the Princess Alice Maud Mary, born April 25, 1843; the Prince Alfred Ernest Albert, born Aug. 6, 1844; the Princess Helena Augusta Victoria, born May 25, 1846; the Princess Louisa Caroline Alberta, born March 18, 1848; the Prince Arthur William Patrick Albert, born May 1, 1850; the Prince Leopold George Duncan Albert, born April 7, 1853.

PLATE II.

CLEVELAND SHORTLEGS.

THE PROPERTY OF HENRY HALL, ESQ., OF DUDDING HILL FARM, WILLESDEN, MIDDLESEX

Cleveland Shortlegs is a good bay or brown horse, with black legs, standing sixteen hands and an inch high, with immense bone, and excellent temper. He is now rising seven years old, and has covered two seasons; his first in 1852, with Mr. Groves, at Plumpton Hall, Yorkshire, and last year at Dudding Hill, having been purchased by the Messrs. Hall, at a long figure.

Cleveland Shortlegs, bred by Mr. Edward Temperley, late of Holywell Bank Top, Northumberland, is of the old original Cleveland breed, and got by the celebrated Noble Surprise, dam by Old Golden Elephant, grandam by Summer Cock. This mare, the grandam, was bred by Messrs. Ferguson, of Catterick Bridge, who sold her for a large sum to Mr. Nicholson, of Berwick Hall, for the stud. To pursue the pedigree, we have the great grandam by Luck's-all, and the great great grandam Cleveland Fancy.

Noble Surprise was by Bay Chilton, by Catfoss; Catfoss by Old Grand Turk.

Old Golden Elephant, the sire of Cleveland Shortlegs' dam, was by Noble, and Noble by Joliffe. This mare, the dam of Shortlegs, is also the dam of Young Triumph, sold at two years old for a very large price, to go abroad. She is allowed to be one of the best Clevelands in the three kingdoms, and her produce certainly do everything to warrant the character.

Cleveland Shortlegs is advertised at three guineas a mare, but at half price for any farmer residing within the hunt of the Neasdon Harriers.

ON SOME PROPOSED SUBSTITUTES FOR GUANO.

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

Considerable attention has recently been directed to the source from whence the Peruvian guano of commerce is obtained, its price charged by the contractors, the amount still remaining on the Chincha Islands, and the discovery of a substitute at a less price than that at present charged by the importers of the Peruvian guano.

By a late report from Admiral Moresby, the English commander in the Pacific, it appears that there are still remaining on the guano islands the following number of tons of this powerful manure:—

On the northern islands.....	5,500,000
On the centre island.....	1,500,000
On the southern island.....	1,600,000
Total.....	8,600,000

It seems from the gallant Admiral's report, that there were exported from these islands—

In 1850.....Tons	157,800
In 1851.....,,	252,032

Of these, by far the largest portion came into England, as will be seen by the following table, which gives the amount of the imports into this country during those two years:—

	1850.	1851.
South African.....	2,953	3,184
West African.....	2,626	6,183
Chilian.....	6,224	10,165
Bolivian.....	1,222	6,719
Peruvian.....	95,083	199,732
Patagonian.....	5,587	7,359
Total.....	113,695	233,342

In the year 1852, the imports of guano of all kinds into England amounted to 129,889 tons. The result to which Admiral Moresby arrives he thus gives at the conclusion of his despatch:—
“From the plans and elevations of Mr. M'Intosh, from my personal examination and information, gathered from those on the islands conversant with the working, I am of opinion that at the present average rate of exportation, the islands would be exhausted of the guano which would pay freight, or be saleable in the English market, in eight or nine years.”

With the growing demand, then, for this valuable fertilizer, with a source of supply gradually diminishing, it becomes of great importance to find out, if possible, some mode of manufacturing a manure,

or otherwise procuring a substitute from some other sources. To the first alternative, the attention of the chemist has long been directed; the reward offered by the Royal Agricultural Society may have a tendency to increase the number of those already engaged in so valuable and so national a research. Their deputation to Lord Palmerston may have a similar effect, although the immediate object the deputation had in view is not very likely to be attained; for to endeavour to persuade any foreign government to sell at a lower rate an article of merchandise which that government can already sell at the existing price as fast as it can be shipped, seems to be rather a forlorn undertaking.

It may, then, be useful, at such a period as this, when these great efforts are under consideration in aid of the agriculture of England, if we just refresh our memories by referring to the analyses of different guanos, as well as to those of a few of the different manures which have been suggested as substitutes.

Guano, as I have elsewhere stated (*Farmers' Almanac*), varies considerably in composition. Most of those of commerce have been analyzed by Professor J. F. Johnston (*Ag. Gaz.*, vol. iii., p. 244). He found in these, per cent. :—

KINDS.	Water.	Ammoniacal Matter.	Earthy Phosphates.
Peruvian.....	7 to 9	56 to 66	16 to 23
Chilian.....	10 13	50 56	22 30
Bolivian.....	6	65 64	25 29
Ichaboe.....	18 26	36 44	21 29
Saldanha light..	17 27	14 22	43 56
„ dark..	33 44		
Algoa Bay....	{ 2.26	22.37	70.20
	{ 23.93	23.16	43.15
Halifax.....	24.47	20.61	22.67
Bird's Island..	25.49	19 to 21	{ 22.43
„ ..	14.18			{ 5.37
Patagonian, light	40.99	20 25	21 to 32
„ dark	20.55		

More recently, Professor Way (*Jour. R. A. S.*, vol. x., p. 212) has given the result of his numerous analyses. He found I. the average amount of ammonia, II. the phosphate of lime, to be—in

	I.	II.
Peruvian guano (32 specimens)..	17.41	24.12
Ichaboe (11 ditto).....	7.30	30.30
Patagonian (14 ditto).....	2.54	44.60
Saldanha Bay (20 ditto).....	1.62	56.40

Considerable attention has been recently excited by the discovery of very large accumulations of guano on an island off the eastern coast of Africa. It seems, however, from the following analyses by Professor Anderson, that they are of a quality more resembling Saldanha Bay than Peruvian guano :—

	No. 1.	No. 2.	No. 3.
Water	4.0	8.52	13.52
Org. mat. and ammon. salts	9.12	11.45	15.87
Phosphates	21.88	51.59	59.6
Sulphate of lime	35.41	9.29	0.0
Alkaline salts	8.0	10.96	8.29
Sand.....	21.59	8.19	2.73
	100.0	100.0	100.0
Ammonia.....	0.77	1.31	1.16
Phosph. acid in alk. salts	0.0	0.0	1.31

The great difficulty in the case of preparing a substitute for this manure, is to procure a supply of ammonia, or other nitrogenous substance, at a sufficiently reasonable rate. Then the salts of ammonia of commerce (in which the ammonia exists in a still more concentrated state than in guano) bear a comparatively still higher price; the sulphate of ammonia, for instance, which yields 14 per cent. of ammonia, is worth £15 to £16 a ton. The carbonate, which contains 43 per cent. of ammonia, is sold at about £66 per ton; and the muriate, which holds about 32 per cent of ammonia, sells for about £24 per ton. Even the *animal manure*, from Buenos Ayres, which contains nitrogenous substances, equal to about only 8 per cent. of ammonia, is worth about £6 per ton. This fertilizer is composed of the refuse matters of the flesh of the wild cattle of South America, after the tallow has been steamed from it. It has been examined by Dr. Anderson (*T. H. S.*, 1850, p. 367) and by Professor Way (*Johnson's Fertilizers*, p. 134.) For the following analysis of this manure, by Professor T. Way, we are indebted to the obliging communication of the London Manure Company :—

Water	5.57
Organic matter	59.53
Sand &c.....	11.48
Phosphate of lime.....	18.01
	—
Nitrogen, first experiment	6.56
„ second ditto.....	6.60
Mean	6.58

Which is equal to 8 per cent. of ammonia.

More recently, some very spirited efforts have been made by Mr. Pettit to manufacture an artificial guano from the refuse, or neglected fish, which abound on some of the shores of the United Kingdom. This seems a research in a very hopeful direction; it is certainly endeavouring to follow in

the same field as those very sea-birds who manufactured the Peruvian guano for us; their food being almost entirely fish—their excreta, constituted of the remains of fish, formed those guano beds, in a rainless climate, from whence our mariners are shipping the guano of Peru. The process of Mr. Pettit was stated, at a recent discussion by the members of the Royal Dublin Society, to consist chiefly in treating refuse fishy matter with sulphuric acid, by which a pulp is produced, that needs only drying to form a manure, 100 parts of which, when analyzed by Professor Way, gave the following general results:—

Moisture	4.93
Organic matter	88.36
Sand, &c.	1.35
Earthy phosphates	4.06
Alkaline salts.....	1.30
	—
	100.00
Ammonia	16.78

Here, then, we have a manure closely resembling guano in the amount of its nitrogenous substances; its cost must then be the next consideration, and here, I fear, the great difficulty will occur. It is true that fish are, on some of the shores of our islands, to be obtained, at certain seasons, at a very low rate; but then we must remember that in fish we have to deal with an article which is of an exceeding watery nature; even the muscle of animals has been shown by Berzelius to contain more than 77 per cent. of water; it would not, therefore, probably be far from the truth if we estimate that to produce a ton of guano (as by Mr. Pettit's plan), about nine or ten tons of fish would be required. The Essex farmers, who use fish as a manure pretty extensively, deem a dressing of 50 or 60 bushels of sprats to be a fair dressing for oats, and that these produce a powerful effect, especially in moist seasons, equal to a dressing of 3 or 4 cwt. per acre of guano; allowing a bushel of fish to weigh 56lbs., this would be equal to a dressing of 1½ tons per acre; and allowing nine-tenths of this to be water, we have an application of about 3 cwt. of solid animal matter per acre.

It remains, then, to be seen, if refuse fish can be obtained in sufficient quantities to enable our chemical friends to produce a supply of the British guano. I own I feel some doubts upon this head, although, when lately on the coasts of Cornwall and Devon, the vast shoals of pilchards and other fish which frequent those magnificent shores, did appear to be almost inexhaustible.

Other attempts are now making to produce a rich nitrogenous manure from the sewage matters of our towns; and these plans may be divided into

two classes—1, those which have for their basis the precipitation of the fertilizing matters of town sewage by lime or other chemical substances; and, 2, those which effect the separation by merely mechanical means. The mass of rich fertilizing matters which are obtainable in this way may be fairly considered to be equal to all the probable demands of the English farmer. The solid contents of the matters annually discharged into the Thames through a single London sewer was found by the late Mr. Smith, of Deanston, to be equal to six millions of tons, every 100 tons containing 400lbs. of solid matter. The composition of these matters is as follows:—

A gallon of the liquid portion of the sewage water of the King's College sewer was found to contain 85.3 grains of solid matter. This consisted of a large proportion of *soluble* animal and vegetable matters, besides the following substances:—

	Grains.
Ammonia	3.29
Sulphuric acid	0.62
Phosphate of lime.....	0.29
Lime	6.05
Chlorine	10.00
With some potassa and soda.	

The mechanically suspended matters of a gallon of this sewer water amounted to 55 grains, of which 21.22 grains were combustible, and consisted of animal matter rich in nitrogen, some vegetable matter, and a quantity of fat, and 33.75 of matter consisting of—

	Grains.
Phosphate of lime	6.81
Oxide of iron	2.01
Carbonate of lime.....	1.75
Sulphate of lime.....	1.53
Earthy matter and sand	21.65

These great sources of supply will, I have no doubt, be hereafter rendered available to a very large extent in the production of manure; they will continue to yield a supply, too, when all the guano beds of the Pacific are exhausted. Mr. Caird, of Baldoon, has put the importance of such manures in a very neat way, when he says: "In the United Kingdom we grow annually 5,000,000 acres of wheat. We have imported annually, during the last four years, about 5,000,000 quarters of wheat and flour, or exactly one quarter per acre more than our home produce (a ton of guano is the equivalent of ten quarters of wheat, a cargo of 1,000 tons, of 10,000 quarters), and that quarter per acre I am persuaded might be got."

The investigation, then, as to the increased production of nitrogenous manure, is a research whose importance it is impossible to over-rate; it is one in which any successful results will not only be fraught with advantage to the skilful farmers of our soils, but to the community at large. Such improvements, let us not forget, seem not only to render us independent of foreign nations for the supply of our food, but it gives additional employment to the most valuable portion of our labouring population.

ON THE SILICA STRATA OF THE UPPER GREEN-SAND.

Resuming our examination of geological papers in the last number of the *Journal* of the Royal Agricultural Society, we come now to that of Professor Way and Mr. Paine—on the silica strata of the upper green-sand. This is a geological, chemical, and agricultural description of the strata between the gault and the chalk. The upper green-sand—in its range at the base of the chalk hills of Kent, Sussex, Surrey, Hampshire, and the Isle of Wight—is known locally as firestone and malm rock. The firestone is a siliceous limestone in the centre of the mass. Above this, in contact with the chalk, and below it, in contact with the gault, are two beds which bear the name of malm rock. They vary in thickness in different parts of their range, and are most extensively developed and best exposed between Farnham and Petersfield. The lowest is the most important. Immediately above the gault, into which it gradually passes, is a soft whitish-brown and very light and porous rock,

having the appearance of a soft limestone. It forms one of the most fertile subsoils of the whole cretaceous group, producing excellent crops of wheat and beans, and is covered with the most productive hop grounds of the Farnham district.

This rock falls to pieces by exposure to the weather, and, under the name of marl, is extensively used in the neighbourhood as manure. Many thousand tons have been raised during the last ten years near Farnham, and have been carried five and six miles as a dressing for the neighbouring sandy and chalky soils, on which its use has been attended with the most beneficial results. Marl it is not, for it contains scarcely any carbonate of lime. Professor Way found, however, on analyzing it, that it consisted chiefly of silica in a soluble state—that is, in the active chemical state, in which it is capable of combining with bases such as alumina, potash, soda, lime, &c., to form silicates. Flint, and quartz or quartzose sand, which are nearly

pure silica, are abundant natural products. More abundant still are the silicates of alumina, potash, soda, lime, and iron, which form the granites and trap rocks. These are slowly soluble in water charged with carbonic acid, and, by their crumbling, form clay, which is a simple silicate of alumina. These are insoluble in water, and acids, and alkaline solutions. Flint may be dissolved, however, by boiling it in alkaline solutions in high-pressure steam-boilers at a high temperature. Quartz is either not soluble by this process, or soluble only at a much higher temperature. The more common way of rendering flint and quartz soluble is by reducing them to powder, and melting them with potash or soda, so as to form alkaline silicates or glasses. These silicates are more or less soluble as the alkali or the silica prevails in their composition. With an excess of silica they are insoluble, like common glass; with an excess of alkali, they are soluble in water. On adding a strong acid to this solution, to neutralize the alkali, a gelatinous precipitate of silica takes place, which, on drying, becomes a white gritty powder. This dissolves with the greatest facility in *boiling alkaline* solutions; and it is in relation to them, rather than to any other solvent, that it is said to be soluble.

Silica, in this state, had not hitherto been discovered in any quantity as a natural product, except by M. Sauvage, a French chemist in the same geological formation in France as that in which it has been discovered by Messrs. Way and Paine in England; and though silica exists, as we have said, in clay, and may be separated from it by chemical processes in a soluble condition, it is not naturally present in that state; and clay cannot be relied on as a source of supply of soluble silica.

The strata between the gault and chalk marl in the neighbourhood of Farnham are 100 feet thick, consisting of many different beds, in which the proportion of soluble silica varies from 25 to 70 per cent. It is mixed with clay, and, in some of the beds, with carbonate of lime. Those beds which contain calcareous matter are principally the hard beds of building stone, known by the name of freestone. The soft beds, which have been found so beneficial as manure, contain nothing but silica and clay. There is a large area of these strata in the neighbourhood of Farnham so exposed as to be easily worked.

The question, then, is—How can this substance be applied to agricultural purposes, so as to be useful beyond the immediate neighbourhood?

The stems of the cereal crops contain much silica, and attempts have been made to produce artificial silicates of potash and soda as manures. No great benefit was derived from them—no benefit at

least commensurate with the cost; though doubts have been expressed whether they were properly manufactured, and were what they professed to be. The expense of their manufacture arose from the necessity of fusing the silica and the alkali.

If silicates of potash and soda are wanted for agriculture, they may be obtained from this soluble silica at a cheaper rate than by fusion. They may be made by two processes:—by boiling in an alkaline solution, or by treating the rock with crude carbonate of alkali at a gentle heat in a reverberatory furnace. In either case it is the silica, not the alkali, which is wanted by the plant; and a great advance will be made if lime can be substituted for the more costly potash and soda in combination with silica. Silicate of lime, however, can only be made by fusion, and when made would be insoluble. The soluble silica of Farnham obviates this difficulty. By agitating in lime-water, or by mixing it in proper proportions with slaked lime, a silicate of lime may be obtained, which is soluble in water—sparingly it is true, but sufficiently so, in the opinion of Professor Way, for the requirements of vegetation.

Its value as a manure remains to be proved by experiment. Theoretically, there is a good hope of success, for silicate of lime has the peculiar property of decomposing ammoniacal salts with formation of silicate of ammonia. Professor Way has urged, in former papers, that crude ammoniacal salts are positively injurious to plants; and that, in good loamy soils, they are presented to the roots in the form of silicates.

The simple silicate of lime, however, is different from the compound form silicate of lime and alumina. This has been shown by Professor Way to be able to separate the ammonia of manures, and to fix them in the soil. Mere silicate of lime will not do this: it cannot make light land more retentive of manure: all that can be expected of it is, that it will render the use of nitrogenous manures more safe on light soils; and the advantages which is gained by lining the lands in which the particles of the silica rock prevail, is a strong argument in favour of the use of it. The discovery of these silica beds brings us, moreover, much nearer to the practical productions artificially of a double silicate of lime and alumina, at a rate which will permit it to be carried to distances as great as guano or superphosphate of lime.

Be this, however, as it may, this much is certain, that the silica rock in its crude state has been found to increase the quantity and improve the quality of the crops of wheat both on the chalk and the siliceous sands of the lower green-sand. It is now carried five or six miles for this purpose, and as railroads afford the means of transport to much

greater distances at no greater cost than that of carting manures in the common way five miles, there is every prospect that along the line of the

outcrop of the chalk—where, however, this rock is only partially developed—it may be extensively used in its crude state to supply a local demand.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The December general meeting of this Society took place 11th Dec., in Hanover-square; Mr. Pusey, the President, in the chair. Among those present were his Grace the Duke of Richmond; Lord Feversham; Sir J. V. Shelley, M.P.; Colonel Challoner; Mr. R. Barker; Colonel R. Blanchard; Mr. C. Erle; the Rev. James Linton, &c.

The SECRETARY (Mr. Hudson) read the following report:—

REPORT.

The Council have to report to the Members at their present general meeting that during the past half year the Society has lost, by deaths or resignations, 43 of its Members, while 156 new Members have, during the same period, been enrolled on its list, which is now constituted as follows:—

- 88 Life-Governors,
- 148 Annual Governors,
- 760 Life-Members,
- 4,073 Annual Members, and
- 20 Honorary Members.

The Council have elected Lord Ashburton to supply the vacancy in the number of the Vice-Presidents, occasioned by the deeply-lamented death of the Earl Ducie; and the Hon. A. Leslie Melville, of Lincolnshire, Mr. Barthropp, of Suffolk, and Lord Bridport, as General Members of Council, in the place respectively of Lord Ashburton, Prof. Sewell, and Mr. Bennett.

A new list of the Governors and Members of the Society having been prepared for insertion in the ensuing number of the *Journal*, the Council submit to the Members on this occasion the following schedule, showing their distribution throughout the kingdom:—

SCHEDULE OF DISTRIBUTION AND REPRESENTATION,

ENGLAND:—	Number of Members.	Amount of Representation in the Council.
Beds.....	48	2
Berks.....	117	4
Bucks.....	66	2
Cambridge.....	58	3
Cheshire.....	56	0
Cornwall.....	61	1
Cumberland.....	43	1
Derby.....	93	0
Devon.....	208	4
Dorset.....	109	1
Durham.....	96	0
Essex.....	142	4
Gloucester.....	134	3
Hants (including Isle of Wight).....	164	1
Hereford.....	100	1
Herts.....	114	3
Hunts.....	36	0
Kent.....	183	2
Lancaster.....	156	0
Leicester.....	71	2
Lincoln.....	174	4
Middlesex.....	266	7

Monmouth.....	27	0
Norfolk.....	256	3
Northampton.....	100	4
Northumberland.....	138	1
Notts.....	101	3
Oxon.....	112	3
Rutland.....	7	0
Salop.....	176	3
Somerset.....	187	2
Staffs.....	137	1
Suffolk.....	126	3
Surrey.....	135	2
Sussex.....	186	6
Warwick.....	76	0
Westmoreland.....	25	0
Wilts.....	97	2
Worcester.....	62	3
York.....	220	5
Total.....	4676	86

WALLES:—		
Anglesea.....	6	0
Brecon.....	29	0
Carmarthen.....	36	0
Carnarvon.....	7	0
Cardigan.....	16	0
Denbigh.....	18	0
Flint.....	24	0
Glamorgan.....	63	0
Merioneth.....	2	0
Montgomery.....	14	0
Pembroke.....	32	0
Radnor.....	6	0
Total.....	256	0

SCOTLAND.....	69	2
IRELAND.....	44	2
CHANNEL ISLANDS, and ISLE OF MAN.....	15	0
(Abroad).....	29	0

General Total..... 5689 90

The Council consists of 75 Members, several of whom represent by their residences more than a single county.

This schedule will enable those friends of the Society, and of agricultural improvement generally, who reside in districts where the number of members is below the average, to ascertain the cause, and possibly remedy the evil, while it will afford an opportunity to the Council of recommending to the Society the election from time to time of such representatives of large bodies of members at present unrepresented, as particularly in the case of Lancashire and the Principality of Wales, as may best promote the agriculture of the particular district and advance the general objects of the Society; the Council being most anxious that their body should be brought as nearly as possible to represent by its members the varied wants and wishes of the agricultural community.

The advantages already gained to the individual Members and the country at large by the aggregate amount of single subscriptions from numbers contributed to the Society, are such as to induce the hope of a still further augmentation of the Society's Members in different parts of the country; while the improved facilities of communication afford every opportunity by which subscriptions

may be paid, information sought or transmitted, and *Journals* delivered free to the Members at their own homes in the ordinary course of the post: the railways furnishing rapid means of transit for passengers, live stock, and implements from every part of the kingdom to the place where the Annual Country Meeting may successively be held. The funds thus accruing to the Society from so large a body of paying Members, will enable it to carry out those extended measures of public utility which it would otherwise be unable to accomplish, and the personal exertions and the practical experience brought into co-operation with the Society by their means will confer incalculable benefit on its proceedings.

The Finances of the Society continue to receive the most vigilant attention of the Council, and they feel it their duty, under circumstances however apparently pressing at the moment, to guard their invested capital, derived from life-compositions, as the sheet-anchor of the Society. The floating cash balance, available for current purposes, is constantly in a state of fluctuation, from various causes, either connected with the irregular remittance of subscription, or from extraordinary demands arising chiefly out of the proceedings of the Country Meetings.

The country generally is well aware of the great service the Society has rendered, in having raised up, by its prizes on the one hand and its most effective tests on the other, a new body of agricultural implement makers, whose talent and workmanship now attract general attention. The Council have spared no outlay of money, nor their members either personal zeal or anxiety, to attain this great object; and having attained it, they feel it their duty to devise means by which the same results may be maintained at a less amount of annual expenditure; and they have therefore caused a detailed statement to be prepared, for the information of the members, of the expenditure in every branch of the Society's country meetings. This has already been completed in the case of the Lewes meeting, and will be inserted in the ensuing part of the *Journal*.

The Gloucester Meeting, notwithstanding the very unfavourable state of the weather on the principal day of the show, fully satisfied the expectations of the Council. The authorities of the city, the local committee, and the owners and occupiers of sites contributed zealously to promote the objects of the Society on the occasion, and received at the time the public thanks of the Members at their General Meeting, held in the County Hall. The Society were again indebted to the liberality of the railway companies, in the conveyance of implements and live stock, and in their general arrangements for the convenience of the visitors. The senior stewards of implements and live stock have drawn up reports connected with their respective departments for publication in the Society's *Journal*.

The Council have decided on the following schedule of cattle prizes to be offered by the Society at the Lincoln Meeting, in the week commencing Monday the 17th of July next:—

	£
Shorthorns	180
Herefords	180
Devons	180
Other breeds	70
Horses	165
Leicesters	120
Southdowns (or other short-wooled Sheep)	120
Long-wooled Sheep (not Leicesters)	120
Improved Lincoln Sheep	50
Pigs	80
	1265

The prizes for implements and for poultry will be decided on the reports of respective committees, on the 1st of February next, when the conditions and general regulations of the prize-sheets will be finally arranged.

Prof. Way, the consulting chemist of the Society, delivered before the members, in May last, a lecture on the management of the sewerage matter of towns as manure for agricultural purposes; and Prof. Simonds, the veterinary inspector of the Society, is continuing his researches into the cause and treatment of diseases occurring among the live stock of the farmer.

The Council witness with much satisfaction the steady support which the Society receives in the acquisition of new members and zealous co-operators, the lively interest created in the districts assigned for the successive country meetings, and the increasing intelligence which distinguishes the agricultural community of the country. Science is no longer regarded as an unattainable acquirement, but has become an active principle, which, like the magnetic needle, points out the course to be steered, when all around is dark and uncertain: it has, indeed, been found to be *that* knowledge which is power.

By order of the Council,

JAMES HUDSON, Secretary.

The Rev. J. LINTON moved "That the report and accounts now read be adopted." He congratulated the Society on its exceedingly flourishing state, as exhibited by a great accession of members, and by the satisfactory state of the accounts; the latter of which, he said, was entirely attributable to the indefatigable exertions of the Finance Committee.

Mr. ASTBURY seconded the motion, which was adopted without discussion.

Mr. R. BARKER, the Chairman of the Finance Committee, presented the balance-sheet, which was as follows:—

HALF-YEARLY ACCOUNT, ENDING 30TH JUNE, 1853.	
RECEIPTS.	
Balance in the hands of the bankers, 1st Jan. 1853	£1,105 4 0
Petty Cash balance in the hands of the secretary, 1st Jan., 1853	20 9 1
Dividends on stock	157 12 3
Life Compositions of Members	350 0 0
Annual Subscriptions of Governors	530 0 0
Annual Subscriptions of Members	2,422 9 0
Receipts on account of Journal	163 9 3
Receipts on account of Cottage Tracts	2 4 11
Receipts on account of Country Meetings	1,526 15 0
Cheque for petty cash drawn, but not cashed ..	50 0 0
	£6,928 3 6

PAYMENTS.

Purchase of stock (£773 17s. 7d. in the 3¼ per Cents.).....	£800	0	0
Permanent Charges.....	170	12	6
Taxes and Rates.....	13	19	5
Establishment.....	481	1	3
Postage and Carriage.....	28	9	4
Advertisements.....	4	15	0
Payments on account of Journal.....	703	15	1
Veterinary Grant (one year and a-half).....	300	0	0
Veterinary Investigations (half a year).....	55	13	0
Chemical Grant (half a year).....	100	0	0
Chemical Investigations (one-third of a year) ..	100	0	0
Prizes.....	414	15	0
Payments on account of Country Meetings....	863	1	11
Sundry items of Petty Cash.....	2	18	10
Balance in the hands of the bankers, 30th June, 1853.....	2,249	15	11
Petty Cash balance in the hands of the secretary, 30th June, 1853.....	39	6	3
	£6,328	3	6

Examined, audited, and found correct, this 9th day of December, 1853.

THOS. RAYMOND BARKER, Chairman.	} Finance Committee.
C. B. CHALLONER.	
HENRY BLANSHARD.	
SAMUEL JONAS.	
THOMAS KNIGHT.	} Auditors on the part of the Society.
GEORGE I. RAYMOND BARKER.	
GEORGE DYER.	

Mr. BARKER explained that the stock which had been purchased was not an accumulation of funds, but a replacing of stock which the Committee had been compelled to borrow.

The Duke of RICHMOND asked what was the amount of arrears on subscriptions.

Mr. BARKER said the question was one to which it was difficult to give a precise answer. The arrears on the subscriptions of the last two or three years amounted to rather more than £2,000. There was a further sum that might be called in arrear, which could not be obtained except under peculiar circumstances.

The DUKE of RICHMOND thought it would be satisfactory to the members to know whether or not the arrears were increased.

Mr. BARKER said they were not increasing. He felt bound to say that the members who had joined during the last two or three years seemed to take a more permanent interest in the Society than many of the earlier members.

On the motion of Col. Blanchard, seconded by Mr. Payne, the thanks of the meeting were given to the auditors, Mr. Barker, Mr. Knight, and Mr. Dyer; and the same gentlemen were re-elected.

The CHAIRMAN said he now wished to ask whether any gentleman present had any question to put with regard to the affairs of the Society. The original charter gave the members greater facilities for meeting and controlling the Council than existed in almost any other Society. It was framed with that view by the late Lord Spencer and his Grace the Duke of Richmond; who were most anxious that the Council should not be considered a close or self-elected body, and that farmers, when they came to London, should have almost unlimited powers of inquiry with regard to their own

affairs. Other societies were satisfied with holding one general meeting a year; this society, besides the one in May, held one in December, because it was thought desirable that farmers who came up to the Smithfield Show should be able then to make what inquiries they pleased with regard to the affairs of the Society. The Council being bound by the charter to convene the meeting on Saturday in the Smithfield week, and the Smithfield Club Dinner, instead of being held on Friday, having been put back to Wednesday, it happened that the attendance was on that occasion smaller than usual. It was never, however, very large; and perhaps that fact might fairly be regarded as a proof of the confidence of the members in the Council (Hear, hear). He need scarcely add that that meeting could convey but little idea of the extent of the country meetings, or of the Society's operations. He would now again ask whether any member wished for any information with regard to the management of the Society?

Mr. C. ERLE wished to know why there had been no lecture in the Smithfield week?

The CHAIRMAN apprehended that the reason was, that it would be difficult to obtain a good attendance, in consequence of the other proceedings of the week. He would undertake, however, to bring the subject before the Council.

The Rev. J. LINTON said, he wished to ask whether the Council were urging on the Secretary of State for Foreign Affairs the necessity of pressing on the Peruvian Government the advantage which they themselves would derive from throwing open their trade in guano? It was well known that at present the trade in guano was confined to a single firm; and what was asked was, not that the Peruvian Government should sell their guano one atom cheaper than they were now selling it to one monopolizing firm, but that they should throw it open to the competition of the shipping interest. As the trade was carried on at present, being confined to a single firm, if it did not militate against the law of nations, it certainly militated against the reciprocity which ought to exist between England and the other countries of the world.

The CHAIRMAN said, he had great pleasure in stating that the Council, at their meeting on Wednesday last, adopted a memorial to the Foreign Secretary, Lord Clarendon; and he (the Chairman) having, at the desire of the Council, requested an interview with his lordship, Lord Clarendon had appointed that day, at half-past three, for the Duke of Richmond, Lord Berners, and himself to present to him the memorial, which was on the subject of throwing open the trade.

The Rev. J. LINTON was sure that step would be most satisfactory to all agriculturists.

The Duke of RICHMOND said, in rising, as he did with very great pleasure, to move a vote of thanks to the Chairman, he wished to say a few words. He was quite sure there was no gentleman present who was not aware of the very great services which Mr. Pusey had rendered to the agricultural world, more particularly in the discharge of the responsible duty of editing the Society's Journal. On that subject, therefore, it was not

necessary for him to say any more. With respect to the trade in guano, he for one thought the matter one of the greatest possible importance to the farmers of the empire (Hear, hear). He did think that the price they now paid for guano was a great deal more than they ought to be charged. There were, however, great difficulties in the way. It was not quite so easy to treat with the Government of Peru as with some other Governments: they suggested difficulties, and they made difficulties. The Council had long tried to effect the object. The meeting was probably aware of the instructions sent out by Lord Malmesbury, when he was Secretary of State for Foreign Affairs. An analysis having been obtained of different manures, the papers were sent to the governors of all our colonies; they were transmitted by the Admiralty to all our consuls, and all the captains of men-of-war, with instructions that if any island could be found where guano or any other manure could be obtained, the surgeons and assistant-surgeons who took part in the discovery, and aided the object by their scientific researches, would on that account be regarded as having a claim on the Admiralty. He believed that in more than one instance, on stations where men-of-war were cruising, a vessel had been despatched to call at different islands to obtain information. He had hoped that before this time some new manures would have been discovered. The great object was to show the Peruvian Government that it was their interest to deal fairly and honourably with them, and not to seek a larger profit than they were entitled to; and he had no doubt that the present Government, or any other Government which might be in power, would do their best to effect that object. If they could discover some other manure, it would be a very good stick for them to have in their hands in dealing with the Peruvian Government (laughter). He (the Duke of Richmond) believed that, if the price were reduced to £6 per ton, double the present quantity would be used; that there was not a practical farmer in England who, where he now laid out £100, would not expend £200, and that a great many would be glad to use guano who were now prevented from doing so solely by the price. One objection to the high price was, that it tended very much to cause adulteration (Hear, hear). On the whole, he could conceive no question on which it was of greater importance that farmers should at the present moment pull well together, in order that they might obtain justice and fair play. That was all they wanted; they objected to being called upon to pay £9 10s. per ton, when £6 or £7 would yield a good profit. He thought every one present would agree with him that they ought to call upon farmers to rouse themselves, in order to get that which was now become almost an article of necessity at a lower rate (Hear, hear). He had great pleasure in proposing a vote of thanks to the President.

Lord FEVERSHAM seconded the motion.

Col. BLANCHARD said Messrs. Gibbs had been called a "monopolizing firm:" he wished to say that he had a strong conviction that they did not sell guano in any way on their own account, but merely on commission for the Peruvian Government (Hear, hear). Consequently,

whether it came into the hands of one, two, or a dozen firms did not signify; and he did not know whether its coming to a firm of such high respectability, which gave purchasers an order to take it out of the warehouses of the West India Dock Company—on whose premises it was landed—was not a greater security for the quality than they would have if any individual visiting Peru might obtain guano from the Government, and bring it home. That, however, did not affect the main gist of the question, namely, that the Peruvian Government could afford to sell guano a great deal cheaper (Hear, hear).

Sir J. V. SHELLEY did not think the farmers had a right to complain of anything which Messrs. Gibbs did as the agents of the Peruvian Government. The percentage which they received, however, was much larger than that which would be obtained if the agency were entirely thrown open. He believed the Peruvian Government, as well as the farmers, would gain by there being more agents.

The motion was then put by the Duke of RICHMOND, and adopted by the meeting.

The CHAIRMAN begged to return his sincere thanks for the vote which had just been passed; and most gratifying to him was it that it should have been proposed by the Duke of Richmond, and seconded by Lord Feversham. He could only say that he felt it a high honour to be once more their President, and that it was a great delight to him to find the Society in the same flourishing state in which it was twelve years ago, when they met at Liverpool. Next year, they would meet in the centre of one of the most interesting agricultural districts of England, the city of Lincoln, where he was sure the members who attended would find a great deal to interest them. He would only add that the prosperity of their country meetings did not depend on the talents of the President, but on the hearty support which they had hitherto always received from the farmers of England, and which the farmers of Lincolnshire, he knew, were prepared to give them (cheers).

The meeting then separated.

A MONTHLY COUNCIL was held at the Society's House in Hanover-square, on Wednesday, the 7th of December. The following Members of Council and Governors of the Society were present: Mr. Pusey, President, in the Chair; Duke of Richmond, Earl of Lucan, Lord Camoys, Lord Berners, Lord Feversham, Lord Portman, Hon. A. Leslie Melville, Sir John Villiers Shelley, Bart., M.P., Sir Matthew White Ridley, Bart., Mr. Raymond Barker, Mr. Barnett, Mr. Hodgson Barrow, M.P., Mr. Barthropp, Mr. Blanshard, Mr. Bosanquet, Mr. Bramston, M.P., Mr. Brandreth, Colonel Challoner, Mr. Druce, Mr. Garrett, Mr. Grantham, Mr. Hornsby, Mr. Hudson (Castleacre), Mr. W. Fisher Hobbs, Mr. Kinder, Mr. Milward, Prof. Simonds, Mr. Simpson, Mr. Turner (Barton), Prof. Way, Mr. Wingate, and Mr. Woodward.

FINANCES.—Mr. Raymond Barker, chairman of the Finance Committee, laid before the Council the report on the accounts of the Society; from which it appeared

that the current cash-balance in the hands of the bankers at the end of the previous month was £693.

CATTLE STEWARD.—On the motion of Mr. Barnett, seconded by Mr. Raymond Barker, Mr. Francis Woodward, of Worcestershire, was elected one of the Stewards of Cattle at the ensuing three country meetings of the Society, in succession to Mr. Milward, who retires from that office this year by rotation.

PRICE OF GUANO.—A communication on the subject of the supply of guano to this country, from the Liverpool Chamber of Commerce, having been read, the Council agreed to the following memorial, which the President, accompanied by the Duke of Richmond and Lord Berners, should be requested to present to the Earl of Clarendon, H.M. Secretary of State for the Foreign Department:—

That the Council of the Royal Agricultural Society of England, being deeply sensible of the hardship inflicted on the British farmer by the excessive price of Peruvian guano, trust that the endeavours of her Majesty's Government will be directed towards the reduction of the cost of this important manure.

WOOL.—The President having stated Professor Solly's wish to make a collection of English wools for the National Trade Museum, the Duke of Richmond, Lord Berners, Sir John Shelley, Sir M. W. Ridley, Mr. Hudson, of Castleacre, Mr. Druce, Mr. Turner, of Barton, and other members of the Council, expressed their willingness, in their individual capacities, to supply specimens from their respective flocks for the public object in question.

COMMITTEE REPORTS were received and confirmed from the chemical, implement, and poultry committees.

STANDING COMMITTEES.—The Council appointed the following standing committees for the ensuing year:—

FINANCE COMMITTEE.—Mr. Raymond Barker, Mr. H. Blanshard, Mr. Brandreth, Colonel Challoner, Mr. Fisher Hobbs, Mr. Jonas, Mr. H. Wilson.

HOUSE COMMITTEE.—The President, Chairman of Finance Committee, Sir John V. Shelley, Bart., M.P., Mr. Raymond Barker, Mr. Brandreth, Colonel Challoner, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Kinder.

JOURNAL COMMITTEE.—Mr. Pusey, *Chairman*; Duke of Richmond, Lord Braybrooke, Lord Portman, Hon. R. H. Clive M.P., Sir John V. Shelley, Bart., M.P., Sir Charles Lemon, Bart., M.P., Sir J. V. B. Johnstone, Bart., M.P.; Mr. French Burke, Mr. Childers, Mr. Evelyn Denison, M.P., Mr. Hyett, Mr. Miles, M.P., Mr. Milward, Mr. H. S. Thompson.

CHEMICAL COMMITTEE.—Mr. Pusey, *Chairman*; Sir J. V. B. Johnstone, Bart., M.P., Mr. Dyke Acland, Dr. Daubeny, Mr. Hoskyns, Mr. Hudson (of Castleacre), Rev. A. Huxtable, Mr. Hyett, Mr. Jonas, Mr. Lawes, Mr. Miles, M.P., Mr. J. M. Paine, Mr. Sheridan, M.P., Mr. H. S. Thompson.

VETERINARY COMMITTEE.—Mr. Raymond Barker, *Chairman*; Duke of Richmond, Sir John V. Shelley, Bart., M.P., Sir J. V. B. Johnstone, Bart., M.P., Mr. Brandreth, Col. Challoner, Mr. E. Denison, M.P., Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Miles, M.P., Mr. Milward, Mr. Pym, Professor Simonds, Professor Spooner, Mr. Thompson.

GENERAL LINCOLN COMMITTEE.—Lord Ashburton, *Chairman*; Hon. Leslie Melville, *Vice-Chairman*; Earl of

Yarborough, Hon. R. H. Clive, M.P., Right Hon. Sir John Trellope, Bart., M.P., Sir John V. Shelley, Bart., M.P., Sir John V. B. Johnstone, Bart., M.P., Sir Montague Cholmeley, Bart., Mr. Raymond Barker, Mr. Barnett, Mr. Brandreth, Major Cavendish, Colonel Challoner, Mr. Denison, M.P., Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hudson (of Castleacre), Mr. Jonas, Mr. Milward, Mr. Simpson, Mr. Thompson, Mr. Wingate.

IMPLEMENT COMMITTEE.—Colonel Challoner, *Chairman*; Lord Portman, Sir John V. Shelley, Bart., M.P., Sir M. W. Ridley, Bart., Mr. Brandreth, Major Cavendish, Mr. Evelyn Denison, M.P., Mr. Garrett, Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hornsby, Mr. Miles, M.P., Mr. Thompson.

GUANO-SUBSTITUTE COMMITTEE.—Hon. R. H. Clive, M.P., Sir John V. Shelley, Bart., M.P., Mr. Raymond Barker, Colonel Challoner, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hudson (of Castle-acre), Mr. Pusey, Mr. Thompson.

* * * The President, Trustees, and Vice-Presidents are, by the bye-laws, *ex-officio* members of all Committees.

PLEURO-PNEUMONIA.—Lord Berners informed the Council of the decided success that had attended Professor Simonds's personal examination and treatment of his cattle labouring under severe attacks of pleuro-pneumonia, not a single animal having been lost after the administration of the remedies prescribed, although many had died previously. Professor Simonds took that opportunity of laying before the Council an official report of his visit to the herd referred to by Lord Berners.

MISCELLANEOUS.—Communications were received, and referred to the first weekly Council on the 8th February, from Viscount Palmerston, Mr. Arkwright of Sutton, Mr. Wm. Fox, Messrs. Burgess and Key, Mr. L. H. Spooner, Mr. Bentall, and Mr. Dalgairns.

A SPECIAL COUNCIL was held on Thursday, the 8th December. The following members of Council and governors of the Society, were present: Mr. Pusey, President, in the chair; Earl of Yarborough, Lord Berners, Lord Feversham, Hon. A. Leslie Melville, Sir John Shelley, Bart., M.P.; Sir M. W. Ridley, Bart.; Mr. R. Westwood Baker, Mr. Raymond Barker, Mr. Barnett, Mr. Hodgson Barrow, M.P.; Mr. Barthropp, Mr. Bramston, M.P.; Mr. Brandreth, Mr. Fisher Hobbs, Mr. Hudson (of Castleacre), Mr. Kinder, Mr. Milward, Prof. Simonds, Mr. Simpson, Mr. Thompson, Mr. Turner (Barton), Mr. Jonas Webb, Mr. Wingate, and Mr. Woodward. The Council decided on the prizes for live-stock to be offered by the Society for the Lincoln meeting; referring to the Monthly Council on the 1st February the prizes to be offered, on the report of the respective committees, for implements and farm poultry, and the general conditions and regulations of the prize-sheets.

The AUDIT OF ACCOUNTS was held on Friday, the 9th of December: present, Mr. Raymond Barker, *Chairman*; Colonel Challoner and Mr. Blandford, *Members of the Finance Committee*; Mr. Knight, of Edmonton, Mr. George T. Raymond Barker, of Fairford Park, and Mr. Dyer, of Barnsbury Park, *Auditors on the part of the Society*. The accounts being examined, audited, and found correct, were

certified accordingly by the signatures of the parties present.

A SPECIAL COUNCIL was held on the same day: present, Colonel Challoner, Trustee, in the Chair; Mr. Raymond Barker, Mr. Blanshard, Mr. Milward, and Mr. Simpson. The report to be made by the Council to the ensuing general meeting of the Society, was taken into consideration and agreed to.

The December GENERAL MEETING of the Society was held at the House of the Society, in Hanover-square, on Saturday, the 10th of December. Among the parties present were: Mr. Pusey, President, in the Chair, Duke of Richmond, Lord Feversham, Hon. A. Leslie Melville, Sir John V. Shelley, Bart., M.P., Mr. Astbury, Mr. Raymond Barker, Mr. George Raymond Barker, Mr. Blanshard, Colonel Blanshard, Colonel Challoner, Mr. Dyer, Mr. Christopher Erle, Mr. Eggar, Rev. James Linton, Mr. J. C. Morton, Mr. Mainwaring Paine, Mr. Pocock, Mr. G. H. Ramsay, Mr. John Russell, Mr. D. Taylor, and Mr. Towneley, M.P.

The Secretary, by direction of the President, read the report from the Council [which we give at length on page 6.]

The meetings of the Council stand adjourned over the Christmas recess, to Wednesday, the 1st of February.

NEW MEMBERS.

The following new members were elected:—

Barton, Rev. H. I., Wicken, Stony-Stratford, Bucks
 Bateman, Lord, Shobden Court, Leominster, Herefordshire
 Beddoes, T. Minton, Minton, Church-Stretton, Salop
 Cook, George, Flitwick, Amptill, Beds
 Cooper, Nathan Jackson, Eastland House, Warsop, Notts
 Deane, Francis Henry, Eastcot, Ruislip, Middlesex
 Dew, Tomkyns, Witney Court, Hereford
 Drake, Thomas Tyrwhitt, Shardloe, Bucks
 Edwards, Francis, Bulstrode Park, Windsor
 Emison, John, Over-Dimsdale, Darlington
 Gladstone, Captain, R.M., M.P., Bowden Park, Wilts
 Horton, Thomas, Harnage Grange, Salop
 Hulse, Charles, Hurst, Reading, Berks
 Jones, W. Hope, Hooton Farm, Sutton, Cheshire
 Leigh, Henry Thomas, Turnham Green, Middlesex
 Longmaid, William, Beaumont Square, London
 Macintosh, David, jun., Tavistock Square, London
 Newton, George Onslow, Croxton Park, St. Neot's, Hunts
 Northey, William, Lake, Lifton, Devon
 Ranger, Henry Wright, Court Lodge, Tonbridge Wells, Kent
 Rhodes, James, East Bergholt, Suffolk
 Richardson, Robert, Lower Bebington, Birkenhead, Cheshire
 Stocker, John Palmer, 93, Oxford Terrace, London
 Terry, Francis, Birchdown Farm, Bampton, Devonshire
 Wolton, Samuel, Kesgrave, Ipswich, Suffolk.

The names of 28 candidates for election at the next meeting were then read.

CHRISTMAS BEEF.

Christmas, with all its festivities, is fast approaching, when the poorest cottager in the land should have something extra on his table, if possible. Already youngsters begin to prattle about this and the next thing with uproarious clamour—a parlour exhibition, as it were, where competitors contend who will be heard the loudest. There are more, however, than youngsters in motion for the Smithfield Cattle Show; the Birmingham, Edinburgh, and other exhibitions of fat stock, seeds, roots, and implements, are beginning to engross the attention of older people. It has already, for instance, been queried at more rural fire-sides than one—“Who will have the best Devon, Hereford, or Short-horn?” “who the best long or short-wooled sheep?” and “who the best pig?” while some ominous suspicions are being hazarded that this and the next animal will be excluded the prize-list as too fat. Butchers, again, are beginning to entertain the animating subject of a Christmas stall; and thrifty housewives to expatiate at length on the quality of beef and mutton at this peculiar season of the year, enforcing with practical effect the wholesome doctrine of economy to more than farmers and butchers. Let us dwell for a little on this latter view of the subject—the *quality of butcher-meat*.

The public is getting tired of the *extra fat* meat of our by-gone Christmas shows; and the fact is not to be wondered at, when properly viewed; once or twice, manufacturing and commercial people may throw away something, for the novelty of the thing; but it now ceases

to be a novelty, and the transaction is at variance with their business habits. However prone some of them may be to speculate where there is a probability of profit, they are not the parties to sow in seed time without the prospect of reaping in harvest. Our best butchers are beginning to experiencethis; particularly those who have “a family trade;” so that the gross cases of obesity now fall into the hands of others who look less to quality than something bulky for ready money.

But while there is still some reason for complaining of over-fatness, there is, on the other hand, a vast amount of ill-directed prejudice levelled against it on every occasion; as if farmers, in the manufacture of beef and mutton, could mix muscle and fat as the manufacturer does the warp and woof in the manufacture of broad-cloth. Imagination cannot concoct absurdities too gross as to the food which feeding stock of this description eat. We shall not offend the ears of our readers by quotations from the list of bovine edibles according to their credulity; suffice it to say, that they appear entirely ignorant of the fact that two animals fed on the same species of food will produce, the one fine quality, and the other inferior—the one mixing the fat well, producing richly-marbled meat, the other laying it on irregularly on the outside, the muscles remaining bundled together, rigidly tough, and almost free from any mixture of it. Considerable improvement has been made during the last few years, in selecting the former class of animals and rejecting the latter; but the task is beset

with many more difficulties than objectors seem to imagine, for sometimes animals do not develop any irregularity in the disposition of the fat until they attain a certain age and weight. Up to this period there is nothing offensive to the eye, perhaps, and scarcely anything to the handle. It is a difficult task to purge feeding stock of this hereditary propensity; for, after all the expense and trouble the farmer has incurred in improving his breed, it manifests itself in degree in cases the least expected.

It is not, however, so much the quality of live stock that we have to deal with, on the present occasion, as dead meat, which may be divided, for the sake of perspicuity, into three classes: *first*, good, including every degree of fatness, the fat and muscle being properly mixed; *second*, bad, where the fat and lean do not mix properly; *third*, diseased, or where the meat assumes a degree of unhealthy fat and muscle unfit for food. These we shall very briefly glance at separately.

First, beef and mutton cannot be too fat, provided the fat and muscle are properly mixed, and of good quality and fair proportions separately. Muscle and fat have individually different qualities, as well as when the two are mixed together. The muscle of the ox, for instance, is different from that of the sheep, swine, poultry, and fish, and the muscle of one ox from that of another, as different to the taste as it is to the appearance. So also is the fat. Both are also affected by age. If the two are of good quality separately, they cannot be bad when mixed together in the proper proportions, or in what is usually termed finely-grained meat. Even setting aside proportion, we have seldom seen an instance in which the fat predominated to excess; for before it does so, it assumes an unhealthy form, falling under the third class.

Muscles—in common language, flesh—constitute by far the largest part of the body, consisting of a congeries of fibres, usually parallel to one another, and bound together in bundles. Each fibre or thread, as seen by the naked eye, when examined by the microscope, is composed of a number of smaller fibres, forming smaller bundles similar to the larger ones. Both the large and small are bound together by or sheathed in cellular tissue, every one of the smallest fibres being also surrounded with tissue, and the whole liberally supplied with nerves and bloodvessels. Flesh is thus a compound of various substances, principally four in number—albumen, lactic acid, salts, and extractive matter. It is this latter which gives to roast and boiled beef their peculiar flavour. It is stronger in some animals than in others, and in aged than young; hence the complaints now heard among our nobility and others that they can no longer get the rich-flavoured roast beef and gravy of the olden time, the meat being less aged. Formerly few oxen were killed before six years old; now the majority are probably slaughtered at two, Scots excepted. With regard to solid and liquid substances, lean beef contains about 77 per cent. of water, and 23 of dry matter.

It is to proportional differences of the solids and liquids, as well as the presence of foreign matter,

that are to be attributed differences of the quality of the lean of meat. If the exhalents of the skin and lymphatics are inactive, for instance, we cannot expect the same quality as otherwise. If animals are slaughtered in an excited state, or if they have been labouring under excitement immediately before being slaughtered, and the system not restored to a healthy state when slaughtered, the meat will be injured. Certain kinds of food not worked up, and their deleterious matter carried off when slaughtered, will also injure the quality; and so will the counter state, fasting, and its consequences: because all such changes produce a difference of the proportion of the solids and liquids, besides the introduction of foreign matter.

Fat is composed of two substances—stearine and elain—mixed in different proportions, not only in the ox, sheep, and pig, but also in individuals and different beasts. The fat of the kidneys, for instance, is different from that of the intestines, rib, rump, and other parts where it mixes with muscle. Its object is of a twofold character—for lubricating the muscles, making them play freely among each other, and for respiration and transpiration, or to supply the lungs with carbon in the absence of such being derived from food, and that emitted from the skin in the sensible and insensible perspiration, in both cases keeping up the heat, reparation, and health of the body. This latter process of transpiration is not yet satisfactorily determined; but we ourselves believe the consumption of fat in the lubrication of the muscles, and transpiration, to be much greater than is generally credited; for the daily waste of it in the absence of food is far greater than that required by the lungs alone. During life, or so long as the blood—or rather the whole fluids—continue to circulate, the muscular system may be compared to a perpetual motion, obviously incurring a large waste of motive power. It is a well-authenticated fact, that if the exhalents of the skin are shut but for a very short time, the whole system is deranged, obviously proving that a large quantity of deleterious matter has not been carried off as it should have been. Such, therefore, being the facts of the case, it is manifest that the most economical disposition of the fat is immediately where it is required for use, or mixed with the muscle, forming what is termed finely-grained meat. When of the best quality, ox fat has a clear and pinky-white appearance.

Such being the nature of the lean and fat of butcher-meat, the soundness of our conclusion will readily be appreciated—that there is never any loss experienced on the table by too much of the latter being mixed with the former; so that the expression, “over-fat,” is inapplicable to this class or description of meat. Indeed, when we come to this part of our subject (the cooking), we shall find the opposite experienced—too little fat. Parties, therefore, who are not capable of judging of the quality of butcher-meat before being slaughtered—who cannot say whether this ox, sheep, or pig belongs to this description of meat or the next—ought to be cautious in passing hasty, and, it may be, sweeping conclusions against animals exhibited at Baker-street, or any of our other shows; while breed-

ers and feeders ought at all times to test the value of their own judgment by a comparative examination after their stock are slaughtered. *In point of fact, we want Christmas exhibitions of butcher-meat to follow our Christmas exhibitions of fat stock—a plan which would prove no less salutary to farmers than to butchers and the public.*

Second.—Where fat and lean do not mix properly, the former being deposited in large masses in particular regions of the body—as the rump, hook-bones, rib, &c., separate from the lean, or comparatively so—there is obviously some constitutional defect in connection with the adipose tissue; but, when we say constitutional defect, it must be borne in mind that NATURE is ever apt to adapt herself to her own peculiar exigencies. In warm climates, for instance—such as in Persia, Hindostan, and Africa—we find the humped ox and fat-rumped sheep. Evaporation from the skins of such animals, often exposed to the sun during the heat of the day, browsing in open grounds, must be great; hence it has been concluded that the accumulation of fat in these cases is a provision on the part of Nature for lubricating the skin and keeping it in an open, healthy, and flexible state, without which the opposite would be experienced. Following out the line of argument here involved, we arrive at the conclusion that, so long as we follow the practice of out-door feeding—exposing our stock to the influence of the weather—we shall not get rid of the defect complained of. We may feed indoors until the world has learned to live without butcher-meat, if such a period is destined to come; but, so long as we breed out-doors, we shall have unsightly lumps of fat disfiguring our oxen and sheep, reducing the value of their meat as an article of food. Now, although we may not concede to the full length of this conclusion, yet it is manifest that exposure and food have a very great influence upon the quality of the butcher-meat in question. If, in the first place, we breed our bulls, cows, and calves exposed to the influence of the scorching sun of summer and the frigid winds of winter, that must not only affect the functions of the skin, but also those of the adipose tissue which lines the interior side of it; for the demand of the former upon the latter will be in proportion to hot or cold atmosphere. Experience is familiar with the fact that both cold and heat consume fat; and before fat can be consumed, in this case, it must be manufactured and deposited in the adipose tissue, because the consumption is irregular. Were the consumption equal, as in the case of the lungs, we could suppose a regular supply from the blood; but when the extra consumption is limited to six or eight hours of the four-and-twenty, as in summer, we must lay up an extra store in the adipose tissue during the sixteen or eighteen hours of the day, when there is none on which to draw during the former period. Consequently, by peculiar circumstances, Nature acquires a predisposition to store up fat where she can best carry it, and where it is most required.

In the second place, when the food is wholly composed of the elements of fat, and destitute of those of muscle, extra quantities of fat may be manufactured

and deposited in particular regions where required. Nature not only acquires a predisposition to store up fat in isolated regions of the body, but to economise it in others, as in the case of the muscles or flesh on the rib, &c.; for, if the raw materials supplied her contain only a certain portion of fatty matter, she cannot manufacture and deposit it in two places. She may divide it; but then, if she gives one part more than its fair share, she must just rob the other by so much. If she be profusely liberal in the one case, to meet the peculiar exigency in question, she must be niggardly economical in the other before she can do so.

Flesh always contains less or more fat for the purpose of lubrication, but sometimes very little in the qualities under notice. The feeding of cattle matured in growth is the storing up of fat; and, in cases of this kind, it is stored up irregularly, the greater portion being deposited in large masses together, or in layers in the cellular membrane, which divides the different sets of muscles, as when they cross each other, &c.; but in the interior of the large and small bundles of fibres, already noticed, there is comparatively no extra quantity stored up, so that certain parts of the animal only take on fat, while other parts remain comparatively as they were when it was put up to fatten. The cells of the adipose tissue, which cover the larger membranes and viscera, are filled with fat; but those of the smaller membranes, which sheath the larger and smaller bundles of fibres, are left comparatively empty—so much so that, to the naked eye, they appear devoid of adipose tissue altogether, although such obviously must exist, since they do so in well-grained meat. It is here where the defect lies, one which appears to be in the absorbents, whose office is to fill the cells of the adipose tissue; for, if they are never filled, they cannot grow.

Where there is a deficiency of fat for lubrication, the fibres are hard and tough. In no case are they so good as when properly grained; and the fat, although free from disease, is also inferior in quality to that of the first class, especially when old.

There are several intermediate qualities, as it were, between the first and second class, where the beef or mutton is well mixed in one part and not so in another, and where there are considerable accumulations of fat in certain places. Of this description we last year examined many examples purchased from the Great Monday Market as well as the Bazaar, Baker-street, some of which were well mixed on the rib, but the muscles of the rump and buttock, or round, deficient of fat. In others, there were finely-grained rump steaks; while the roasting parts of the fore-quarters were badly mixed, the fat being in thick layers between the different sets of muscles. Sometimes the "thin flank" was finely grained, while in others the reverse was exhibited. It was more rare to find a well-grained round with the rib and rump defective.

Butchers' stalls about this season afford many examples of the above kind (not Christmas Show meat), forming perhaps upon the whole the widest field for discussion of any, the different breeds generally exhibiting peculiar cases; but our present limits will not permit us

entering upon the peculiarities of Devons, Herefords, short-horns, and Scots, the utmost we can do being to silence a common objection brought against it by superficial or inexperienced observers, who erroneously impute the whole to over-feeding.

The objection being a common one, is on that account deserving of special refutation. It has reference both to the food consumed by the animal, and to the quality of the article manufactured from it. Too much food is the cause of the over-fat meat. The farmer puts too many raw materials into the ox-skin, the result of which is an inferior article. Four bushels into the sack and the wheat is good; but if you put in five you spoil the whole (?). The argument is altogether inconclusive, because the fat and lean of the butcher-meat in question are both of good quality, comparatively speaking. The question just resolves itself into this:—If a pound of muscle mixed with a pound of fat makes the best beef when properly grained, would the same pound of muscle and the same pound of fat not mixed, but lying in layers, the one united to the other by cellular tissue, make over-fat meat? Our objectors answer in the affirmative. The ox which produced the former was fed as he ought to have been; but the one which produced the latter was overfed. The case is often worse than this, for it is no rare thing to see such parties object to one piece of beef upon the butcher's stand as over-fat, shaking their heads and condemning it as "blubber," and all sorts of stuff unfit for food, and yet to purchase another piece, well mixed, but containing proportionally a much larger quantity of fat than what they had just condemned. They are, in short, often the parties who understand how teas and sugars should be mixed, but they unfortunately have not yet learned how farmers should mix the fat and the lean in the feeding of stock, and the information these derive from public exhibitions of fat stock for doing so, or they would be more cautious and charitable in their opinions.

Where the ox has arrived at maturity of growth before being put up to fatten, any additional weight afterwards gained is no doubt fat; so that less food would produce less fat: and it is more than probable that many examples of this kind ought to be slaughtered sooner than they are, because they often only mix fat with the muscle partially for a certain length of time, and then afterwards lay it all upon certain places, which rather diminishes than adds to the value of the former. But examples of this kind are the exception in our fat stock markets, or on butchers' stalls generally; for before parties could get rid of the fat against which they complain by less food, the lean would be of a quality they would then turn their backs upon.

The above argument is only applicable to old cows and ewes, with a few Scotch and Welsh beasts, including also much of our Christmas Show beef, which we shall further notice separately; for the majority of oxen and sheep are now fattened while growing, being often slaughtered before they have arrived at full growth. Hence the work of feeding becomes of much more importance, and tenfold more difficult to perform; for to give less food is to grow less bone and muscle, as well as

fat, and to over-feed is to produce surfeit, if not death, or else dyspepsia, dropsy, obesity, &c., as consequents, yielding a quality of butcher-meat which falls under the third class.

Some of our Christmas Show beef and mutton is no doubt over-fat. The lean and fat are both good, and tolerably well mixed occasionally it may be, but the latter preponderates in quantity. The proportion of fat considerably exceeds what it should do. The animals were not only fed to the greatest pitch while growing, but they were also fed after bone and muscle had ceased to grow; so that during the latter period they only manufactured fat. If we suppose that at three years old they had attained maturity of growth—that at that age they belonged to the first class—the fat and lean being finely mixed in due proportion, or yet to the second-class, where fat and lean did not so mix, but were, nevertheless, in just proportion to one another, supposing the best quality of each; that at four years old the beef had increased 20 stones (160lbs.) in weight, the fat and lean being still good in quality, and mutton in a similar ratio to weight; and that at five years old it increased other 20 stones, but that the quality of both lean and fat had depreciated—then we arrive at a series of facts easily disposed of; for if we further suppose that the eight examples are lying before us—four of beef, and four of mutton—on a butcher's stall, then we conclude that the beef and mutton of the first and second class, forming the first and second examples of each, were slaughtered when ripe; that the third example was fed one year too long, and exhibited 20 stones of extra ox-fat, and mutton fat according to the weight of the carcase of sheep; and that the fourth example belongs to the third class of meat. During the first three years, neither of the last two examples of each were over-fed; during the fourth year, both consumed less food, manufacturing what was not required for the immediate use of animal life and the reparation of the system into fat, depositing it in thick layers and masses in various regions of the body, without in the slightest degree injuring health, nature being always able to store up to a certain extent provision for future emergencies; and during the fifth year, health, in the fourth example, had to a certain extent given way. The economical functions of nature are limited to her wants; and in this case art had ambitiously decoyed her beyond these, for the ox and sheep were not only fed too long, but pampered and overfed during the last year, when no more food ought to have been given than was necessary for keeping up the weight of the previous year. It is but proper, however, to notice here that there are comparatively few cases where the ox or sheep will eat to injure health.

Third.—Beef and mutton belonging to this class are of an inferior quality both as regards fat and lean. We cannot have the one good, and the other bad. The well-known laws of sympathy exclude the possibility of this. They may be of any age and degree of fatness, and the lean and fat may be well mixed, as in the first class, or they may be badly mixed, as in the second.

The quality may have been bad from calving and lambing, or it may have arisen from injudicious feeding or management afterwards, or any of the many maladies to which flesh is heir. The shortest and most satisfactory way of discussing a subject so comprehensive and important will be by a few examples, for which purpose we shall include or follow the arrangement given in the preceding paragraph.

1. Let us suppose it the beef of a two or three-year-old ox of the first class, of the maximum degree of fatness. Ten days, we shall say, expired between the time the animal left the feeding-box of the farmer until it was slaughtered, during which it was half starved and in a state of excitement from travelling by rail, fatigue in marketing, and exposure to the vicissitudes of the weather; consequently the stomach and bowels became deranged, the transpiration stopped, or nearly so, and in short, the whole system was in a febrile state—a complication of maladies which the animal may have got over by resolution, had it not been slaughtered in this state, the virus of the complaint being carried off in the urine, or by a discharge from the nostrils, or by some affection of the skin; but not being so carried off, it remained in the meat—inoculating it, converting the mass into a complete state of corruption in a very short time, in warm weather, so far as not sold and consumed immediately when slaughtered; and to add to the calamity, animals in this state never “die well” (bleed well). When they leave home they may promise the best beef a grazier ever fed; but three days after, being slaughtered in the heat of summer, it is sent to the knacker’s caldron and tallow-chandler for “cats’ and dogs’ meat” and candles; or the depreciation of quality may scarcely have been perceptible; or it may have been in any of the one-hundred and eighty degrees between those two extremes.

2. The beef of a two or three-year-old ox of the second class of meat, exhibiting the fat and lean in just proportions, but not well mixed, is similarly situated to the last, only more liable to suffer injury from the animals being less active and hardy to stand the fatigue of marketing, exposure, &c. The odds are considerably against them, and the quality of the meat is affected accordingly. The lean is often watery, as it were; and the fat soft and badly coloured—the two requiring a good deal of skewering to keep them together in the cooking. As in the first example, nothing can be said against the grazier for his hands are clean, the ox having been fed in the best manner possible.

3. Following the order already given of the beef of a four-year-old ox carrying twenty stones of extra fat exclusive of loose fat on the viscera, which does not come within the question at issue in any of the cases, and where the fat and the lean were both of good quality up to the time the ox left the stall of the farmer, but where both are deteriorated by the time they fall under the hand of the cook; then this deterioration is easily accounted for—the ox being greatly more susceptible of injury than in either of the previous two cases. In many instances—we may safely say the majority—butcher-meat of this quality always sustains less

or more injury even at our Christmas Shows, where farmers pay all attention to their oxen, personally sparing neither labour nor expense to avert the calamities of which we complain (for the task is too much for them to perform), considerable deterioration being always sustained. The ox, for instance, always loses fat, supposing his bowels, stomach, and transpiration not injured; and this fat is not first taken from the detached masses, but from the fat in the immediate vicinity of the muscles and nerves, reducing the quality of the lean; and not only the lean, but the fat also, which acquires a yellow or darker colour from the presence of residuary matter which the system was unable to remove so fast as the fat itself was pulled down, so to speak. The building was faster pulled down than the rubbish was removed. Hence, the consequences which follow. Now, if such is the case with butcher-meat from our Christmas Exhibitions, where so much attention is paid to the comfort of animals, what must be the case with the bulk of the butcher-meat from the great Monday’s market of Smithfield? The answer is obvious.

4. We shall include under this example every case where the health of the animal, and hence the quality of the butcher-meat, had been injured prior to leaving the stall of the feeder, from the poorest skeletons which appear in Smithfield Market to the grossest cases of obesity from the Bazaar, Baker-street; so that our observations must necessarily be very brief; for which purpose we shall divide the whole into two classes—first, cases falling under obesity, and, second, all others.

Obesity, or Polysarcia, is a genus of disease in the class *Cachexia*, and order *Intumescentiæ* of Dr. Cullen, involving a vitiated state of the solids and liquids, and swelling of the body. Dropsy, or anasarca, belongs to the same genus of diseases, being an accumulation of lymph in the cellular system; whereas obesity is an accumulation of fatty matter. Cattle are liable to be seized with it at all ages and degrees of fatness, but the more so the fatter they are; while, after they attain to a certain weight, it is scarcely possible to avoid it. It is more likely to arise from any of the other causes which derange the system than the popular notion of too much food—such as badly-ventilated houses when fed indoors, sudden changes of temperature when fed outdoors, injury in any of those frolics to which high-fed and healthy cattle are apt to indulge in at times, or even the want of a diet. The avenues to bad health are many; and whenever cattle manifest a disposition to obesity, the sooner they are slaughtered the better, if fat.

Diseased meat of the other class, which finds its way occasionally to the market, is of various qualities—some not having sustained much injury, while others are altogether unfit for food.

It may have arisen, for instance, from diseases of the skin, or lungs, worms in the *primæ viæ*, tumours, &c. A few cases may arise from surfeit and improper feeding, but they do not form a title of the others. Turn an ox or sheep into the richest pasture or turnip field, and they may injure themselves at first; but after the first ten days are over, it is impossible to make them eat

too much, so that cases of over-feeding are the exception, and very rarely found.

It will thus be seen that a very large quantity of butcher-meat must be less or more diseased, but that less of this is to be attributed to over-feeding, or injudicious feeding, than popular notions would lead us to believe; while the extra fat, so loudly complained of, arises more from the improper mixing of it with the lean than an excess of quantity. The waste of fat thus deposited separately in layers, instead of being grained in the lean, is great in the butcher's-shop, and still more so when placed before the fire. The quantity of fat which the butcher daily cuts off from such, and sends to the tallow-chandler, is considerable, reducing the value of the carcase much below what it would otherwise be. In cooking, again, before the lean is roasted, the fat is almost all melted, leaving the tissue a tough indigestible substance to the majority of stomachs; while, if the fat is cut off, a vast amount of lard must be used. Thus situated, it is no wonder that complaints are made against the quality of Christmas beef, which invariably comprises the largest and fattest description of beasts.

ARTERIAL DRAINAGE.

Whoever was an eye-witness of the devastating floods of last year must feel their sympathies rise as the rains of the past few days have fallen. They were exceedingly disastrous, and the damage sustained incalculable. If the small river Nene will overflow from 10,000 to 15,000 acres between Northampton and Peterboro', as stated in the valuable extract given below, what must have been the number of acres overflowed throughout the kingdom during the floods of last year—and that overflowing twice repeated? The damage must have been immense. This is a subject demanding the most serious attention of the Government. Large sums are continually voted by Parliament for improvements in London—widening streets, building bridges, making parks, and the like. Surely it is time some public measure was brought to bear upon the arterial drainage of the country. Improvements are imperatively demanded for every river in the United Kingdom—improvements in straightening, widening, deepening, and banking the rivers. These will never be effected by proprietors or companies; it must be done by Governmental aid and authority. If the amount lost last year had been laid out in these improvements, the great probability is that the waters might have been conveyed away without damage; at present the flow of the waters is stemmed by innumerable obstacles. We have much pleasure in inserting the following extract from an able review in the *British Quarterly* on the origin and improvement of the Fens:—

"The unceasing rains which have but lately steeped our fields, brimmed our brooks, and deluged our valleys, have led us to consider more energetically than at any previous time, whether the general trunk or arterial drainage of the kingdom cannot be put into a more perfect condition. Our chief rivers, besides the Nile and Jordan, have been flooding the wide flats of meadow bordering their course, and in every county smaller watercourses have deluged pastures, crops, roads, and towns; destroyed buildings, drowned sheep, floated away hay, &c., &c., with immense damage and loss of property. But it is not alone the tenant-farmers, landed proprietors, and other classes, whose capital is destroyed or deteriorated in value, that suffer by the liability of so much ground to these overflows; sickness invariably follows upon the assuaging of the inundant waters, so that the health of the entire population is here concerned.

Formerly the great level and the contiguous lands were rife in fevers and pestilential miasmata; but these, with the dreaded 'fen ague,' have in great measure disappeared, and in its general salubrity this district now compares favourably with the rest of the kingdom. And experience in other districts tells us that, with a further reduction in the amount of surface evaporation, by means of drying and warming the soil to a greater depth, a still greater amelioration of climate and additional healthfulness would result. How greatly, then, must our sanitary condition as a nation be injured! how many lives shortened or emasculated by reason of our frequent floods! If we could form an accurate estimate of the areas of land in England now suffering from the inability of their main channels to carry off sudden or protracted downfall, we should probably be surprised at their aggregate extent. Without precise information, we know that our wet valleys must occupy a large proportion of the country, because of the very general character of the late floods, and the existence of overflowing brooks in every county, and upon every geological formation. The Nene, in its frequent swellings, often overspreads 10,000 to 15,000 acres between Northampton and Peterborough before it enters the Fens; the Ouse probably damages a greater extent; and the Welland, and other fen rivers, inundate in a similar manner. The Severn, the Thames, and innumerable smaller streams, have each a district of its own in the state we are referring to, sometimes amounting to some thousands of acres, in a situation that we should have supposed would have freed them from such inconvenience. A remedy becomes highly important when our bee-hive population need that every square foot of soil should, if possible, be wrought to its highest capability of productiveness. We have seen how the drain-water is drawn off, or, if need be, actually bailed out from our low-lying fen lands; but from our inland valleys, far more favourably situated, the waters are not conducted: they are too often left to feel their own way out, groping circuitously among all kinds of natural obstructions. And, far worse than this, they are purposely retarded in their descent by human agency—by dams and weirs, by water-wheels and locks—so that for want of a systematic arterial arrangement and management of our water-courses, an individual may hold back our drainage to grind his corn, float his barge, or sometimes even to swell his lake or feed his fish-pond. There is no physical difficulty to prevent our clearing, enlarging, and deepening our rivers, so that they can discharge speedily and safely into the sea the heaviest rains that clouds can let fall, and the most rapidly oozing subterranean springs. Engineers can calculate, from the excess of downfall and spring-water over that evaporated, how great a volume must be provided for, in any season; and, knowing the fall of the river bed, they can determine the sectional area of channel able to emit the flood. But when we come to the actual performance of the work, we meet a host of rights and interests conflicting upon the banks of our stream: mills mentioned in Domesday refuse to lose their water-power; navigation or canal companies will not have their 'head' in any way lowered; irrigators of meadows demand our non-interference with their drains and 'carriers'; towns obstinately oppose our alteration of their strangulating bridges and wharfigs; and even a large portion of those lands we seek to benefit persist in declaring their satisfaction with the present state of things, miserable as it is, and their disbelief in the ultimate profitableness of the expenditure to be incurred. To reconcile opposing interests, therefore, there must be either compensation offered them for injuries and removals, or their river may be left to moisten their meadows, turn their mills, &c., by the drainage being formed independently, and carried by culverts underneath it; or, what is still better, the new works may often be contrived so as to augment the water-power of some of the mills, and benefit all other interests concerned—a boon, coupled with a proportion of the labour and charge, thus falling to each. And, of course, all claims must be finally regulated and appeased by the authority of a special act of Parliament. In the Vale of Pickering, in Yorkshire; in the Test and Anton Valleys, in Hampshire; and in the valley of the river Nene, we have examples of such an improvement, either completed or in progress.

"Why should not all the many districts of similar character abundant over central England, and scattered in every county, be likewise ameliorated? Why do not more of our maritime lowlands—such as the marshes of Somerset—fulfil their duty to the inland tracts, by perfecting their river mouths?"

LONDON FARMER'S CLUB.

"THE ADVANTAGES OF A CENTRAL FARMERS' CLUB."

The usual monthly meeting for discussion took place on Tuesday, December 5, at the Club Rooms, Blackfriars; subject—introduced by Mr. Ramsay, of Newcastle-on-Tyne—"The Advantages of a Central Farmers' Club."

The chair was taken by Mr. TRETHERY, who in opening the proceedings said, when he stated the fact that Mr. Ramsay travelled from Newcastle-on-Tyne for the purpose of introducing the question, they must all feel that the club was deeply indebted to him (cheers). He begged, therefore, at once to introduce him to the meeting.

Mr. RAMSAY said: Mr. Chairman and members of the London Farmers' Club, in bringing forward the paper I am about to read, I confess I feel my own inability to grapple with so large a question successfully. I find it not an easy matter. I cannot divest myself of the feeling, that the London Farmers' Club might have selected from amongst its many talented members a gentleman who would have introduced the subject for discussion in a much more able manner than I can. It requires profound knowledge, great energy, and more experience in agricultural affairs than I possess, to frame a constitution for a great central farmers' club; but as my time through life has been much mixed up with other weighty affairs, I feel that my great reliance must rest, not on this paper itself, but on the various opinions which may arise in discussing it, as well as after it has been given to the world by the public press. I shall endeavour to give offence to none; I will make no invidious comparisons between agriculture, manufactures, and commerce, believing that the interest of each is also the interest of the others, and that they are bound up in one common cause for the benefit of the whole. Should this paper lead to beneficial results, I shall think myself fortunate, and amply repaid for my trouble. Without further preface, I shall now proceed to bring forward my subject, viz., The Advantages of a Central Farmers' Club. In the first place, I may be met by a cry against centralization generally, which sometimes carries away with it those who will not take the trouble to form opinions for themselves or to think seriously on any subjects. I hope that in the present case this will not happen, but that every one will judge for himself with regard to the question before him, and assist me in perfecting this attempt at improvement. On looking around, I see that almost every large interest in the state has its central form of government, each in its own way, according to its requirements; and as an interest increases in magnitude and importance, the more this seems necessary. Merchants have their Chambers of Commerce, where they deliberate on their weighty and wide-spread transactions; most large manufacturers have their quarterly or half-yearly meetings; mining and other interests have periodical meetings; scientific men have their societies and lecture rooms; all for the purpose of securing wholesome regulations, and the

spread of useful knowledge in their various spheres of operations. Trade, commerce, and science are promoted and benefited by such means, without any disadvantage to the community, as wholesome competition and demand and supply eventually regulate prices and protect the consumer, who is so necessary to us all. Why, then, should not agriculture have its Chamber of Agriculture, especially as in every country agriculture is of the first importance (Hear, hear)? It is true that it has already many valuable institutions of immense advantage to its interest in various ways. Among these the Royal Agricultural Society of England, instituted in 1838, stands pre-eminent, being equalled by no other institution of the kind in the world for its magnitude, its annals of agricultural knowledge in every department, and its wide-spread circulation of truth. Next in extent and importance is the Highland Society of Scotland, which bears date of precedence to the English society, viz., 1784; there are few agriculturists who have not received valuable instruction in the results of its great exertions, and its well-framed code of rules. There are also the rising agricultural Irish societies, by which agricultural improvements of every kind are pushed on with such vigour, enterprise, and talent, as to press hard on the heels of the two former institutions. We have, moreover, agricultural societies and farmers' clubs in almost every county, and innumerable cattle-shows in every part of the United Kingdom. These, however, seem to be spread about without any organisation or order. This leads me to think that there is still need of a great central club, where the abundant requirements and information of the whole may be centralized, analyzed, corrected, and distributed with renewed power and vigour, through every part of this great empire. London at once points itself out as the place above all others for centralization in a great agricultural club; the place where most men of talent meet, where information of all kinds can be most easily obtained, and where we are most likely to have the services of those who hold a large stake in this question. As to the formation of a club, much depends on the reception of the measure. A committee must be formed, to draw out rules for its government; the number of subscribers must be large; local clubs will have to be invited to join, and to send deputations on particular occasions; the proceedings and debates must be published; talent and perseverance in secretaries and agents, and above all, a working committee, will be important features. All farmers' clubs, &c., should be requested to contribute papers and information on agricultural affairs; many other arrangements will be necessary which it is far beyond my power to advise upon, and which can only be brought into play by united efforts. The Central Club should not be composed of tenant farmers alone (Hear, hear); its ranks should include landed proprietors, men of science, and others who feel an

interest in the progress of agriculture; and then it may be hoped that in a multitude of counsellors there will be wisdom, and that all will be benefited. There are many questions of political economy in which agriculturists are deeply concerned, and which may respectfully be brought before the legislature. Time was when agriculturists could not trust themselves to speak on such things, or indeed were not allowed to do so at meetings of clubs or societies; though I fear they often committed adultery in their hearts (laughter), and broke through their own rules. It may, however, be hoped that there is now less difference of opinion amongst them on many weighty questions, and that they can, like other sections of the community, bring their case forward with discretion, judgment, and knowledge. Religion and politics have always been hazardous topics, tending to create disunion; but surely the enlightened men of the present day have sufficient information to form a well-regulated society without allowing these subjects to prevent their deliberations when their great interests are at stake. In referring to important measures for the consideration of a Central Club, I may enumerate a few which, in my opinion, are fit subjects for discussion, viz.: the malt tax; the equalizing of county rates, police rates, poor's rates, and highway rates—whether they should be local, union, or national—whether they should be borne by the state or by separate localities; weights and measures; corn averages, which are now very fallaciously taken (Hear, hear); above all, agricultural statistics generally. Why, indeed, I would here ask, should we not have a Minister of Agriculture like our neighbours, the French? (Hear, hear). One can scarcely think it possible that our many talented Chancellors of the Exchequer have so long gone on making budgets without taking stock, as it were, of the human food on hand to meet the increasing wants of the people. Some slow steps are now being taken in that direction; but, in fact, information on all these points can easily be had, and might have been had long ago; but where is it more likely, or more legitimately to be obtained than through the assistance of the members of a well-constituted Farmers' Club, composed of leading men from all parts of the kingdom? Agricultural statistics ought to be known by every person of intelligence; they are, in truth, only known to a few, and I question if they are correctly estimated by any. Agriculture has now brought science to its aid, and gigantic improvements have been brought into play by geology, chemistry, &c., in every direction. It has become absolutely necessary that the possessors and tillers of the soil should take the position they are entitled to, and form themselves into a Club upon a large scale, in order to multiply in every way the produce of the earth. This seems to be their duty to their country, as well as their own interest; especially when we consider that, with all our skill and industry, we are not able to produce corn, butchers' meat, &c., sufficient for the increasing consumption of the people. Surely, gentlemen, there is a fine field of enterprize before us, and it is to our own interest to cultivate it to the best advantage. The following table shows the population of the

United Kingdom of Great Britain, and the islands in the British seas, at different periods of the present century, to have been as follows:—

Date of the Enumerations.	Persons.			
	Great Britain and Islands in the British Seas.	England and Wales.	Scotland.	Islands in the British Seas.
March 10th, 1801	10,917,433	9,156,171	1,678,452	82,810
May 27th, 1811	12,494,120	10,454,529	1,884,044	95,547
May 28th, 1821	14,402,643	12,172,664	2,137,325	92,854
May 29th, 1831	16,860,138	14,051,886	2,405,610	106,342
June 7th, 1841	18,815,786	16,035,198	2,665,389	126,249
March 31st, 1851	21,121,907	18,054,170	2,922,362	145,435
INCREASE.				
Per cent.				
10-21355 Years 1801—1811	1,506,687	1,298,338	205,592	2,737
10- " " 1811—1821	1,978,522	1,718,135	255,591	7,107
10- " " 1821—1831	2,161,495	1,879,322	268,283	13,888
10-0-219 " " 1831—1841	2,249,648	1,983,212	246,729	19,707
9-8-137 " " 1841—1851	2,308,181	2,018,972	270,022	19,186
100 per ct. "	10,901,534	8,897,999	1,243,910	62,625

You will observe that this table shows an increase of 10,204,534 in fifty years, or nearly double the population. The following is the population of the United Kingdom as given by Porter at three different periods:—1821, 21,282,966; 1831, 24,410,429; 1841, 27,041,031. Porter remarks that this rate of increase could not have been maintained without a concurrent increase in the powers of production arising from the progressive application of capital to the land; and great as has been the effect produced by this cause, far greater results must follow in future years. We next come to the important question of our importations of corn and cattle from abroad. The following table, taken from the *Times* of May the 11th, 1852, will show that, with all our recent improvements, we are sadly deficient in the production of sufficient human food:

TABLE, showing the Importations of Grain to the United Kingdom, reduced to Quarters.

	Flour and Meal.	Wheat.
	Qrs.	Qrs.
1843	1,433,841	
1844	3,030,682	
1845	2,429,916	
1846	4,752,127	
1847	11,915,590	(Famine.)
1848	7,528,433	
1849	10,669,661	
1850	9,019,519	
1851	9,618,026	
1852	8,035,701	3,006,120½
1853, to Sept. 5	7,260,888	

The importation for the present year may fairly be taken at eleven to twelve million quarters.

This year, it is supposed, our wants will require to be supplied, over and above our home growth, with as much as was received in the famine year of 1847, which is a startling quantity to be paid for mostly in gold, and shows the need there is for every exertion being made to increase our own produce, the demand for which is continually progressing. In "Porter's Progress of the Nation," p. 43, a table shows that in the course of 49 years the increased production of wheat has been equal to the wants of 5,835,339 persons. It is said that our population will reach 40,000,000 by the end of the present century, and will require an increase of 150 per cent. of agricultural produce to feed it. According to the official returns, the following were the imports of live stock into England from abroad, during the first eleven months of 1844, 1845, 1846 :

Into all England.			
	1844.	1845.	1846.
Oxen	3,663	9,088	15,740
Cows	1,102	5,891	21,238
Calves	53	574	2,344
Sheep	2,685	11,866	77,221
Lambs	16	112	2,622
Pigs	254	1,144	3,293

Into London alone.		1853.
Oxen		51,663
Calves		25,129
Sheep		208,602
Lambs		8,833
Pigs		9,817

Let us now draw a contrast between the number of cattle which came into all England in the first eleven months of 1844, with the number which came into London alone in the two weeks ending July 25th and Sept. 26th, 1853 :

	In Eleven Months of 1844.	In Two Weeks of 1853.
Beasts	4,765	3,348
Calves	53	1,318
Sheep	2,685	19,156
Lambs	16	950
Pigs	254	898

All these things put together show the necessity for the agricultural interest being up and stirring—first for their own benefit, and next for the sake of the wealth, strength, and happiness of the country. They also show that there is little chance of overtaking the increasing demand for food. The public press has always done its duty in giving our past improvements publicity ; and there is no doubt of such leading papers as the *Mark-lanc Express*, the *Agricultural Gazette*, *Bell's Messenger*, and many others, too numerous to mention, giving their powerful aid to any useful plan for the formation of a great national club. I shall next, sir, make allusion to the agricultural wealth of England and Wales as set down in tables by M'Culloch. He gives the rental of England and Wales at £40,000,000. Therefore, assuming the land to be worth twenty-five years' purchase, the total value is twelve hundred millions of money ; live stock, implements, &c., not being included in the calculation. There is Scotland and Ireland, too ; but as my paper must be kept within reasonable limits, I must refer my friends to their own researches for extended information. I have given these details to show what

a necessity there is for men so deeply interested as agriculturists are to form themselves into a great national club, for a union of their interests and the full development of their resources. We are required now to go far beyond the mere ploughing, sowing, draining, cattle-feeding, which for some time past have successfully progressed and been worked out by all agricultural societies in the kingdom, with the Royal Agricultural Society at their head. To effect the establishment of a Central Farmers' Club, both money and talent are required. In the former particular we are too apt to be parsimonious (Hear, hear). We should turn to the commercial community for an example in this respect ; they know full well that if they subscribe liberally they are repaid ten and twenty-fold (Hear, hear). There is, without doubt, a large increase in the various productions of the earth ; but I believe much remains to be done. Look at the large produce from garden ground as compared with field husbandry. This is obtained by more capital being employed in labour and manure ; and, although we think ourselves the best farmers in the world, I very much doubt if we are not eclipsed by the Belgians and Dutch. The nearer farming approaches to gardening, be assured the larger will be our products. I have laid part of my own land to grass ; yet I find my corn produce, &c., kept up to the same amount by farming the tillage land higher. More cattle and sheep are also fed. What we want, I repeat, is greater unity of purpose, extended knowledge, and larger capital, all stimulated by a Chamber of Agriculture (Hear, hear). As to manures—viz., guano, bones, and special manures of all kinds—they have greatly assisted in improving the produce of the kingdom ; and other fertilizers may yet be discovered of immense benefit to agriculture. Our present club possesses many advantages, and I must say has done good service, and no doubt will continue to be of great use ; but it wants strength, which surely amongst such weighty interests it must have, if every one deeply interested in agriculture will but give a slight helping hand. Should the scheme of a more extended club not meet with sufficient support, the present one ought to be put in a better position—by increased subscriptions, the publication of discussions, which ought to be printed and sent to each member, the increase of the library, and other improvements of a similar kind. I must now, sir, bring my paper to a close, as there seems to be no end to the reasons which may be given for extending the various branches of agricultural knowledge. In one word, agriculturists must become highly enlightened men, and not be contented to keep in the jog-trot of their forefathers (Hear, hear). This paper is only an outline, but I hope will lead many to think seriously on the plan it is meant to originate. With all its imperfections, I trust it will be as favourably received as my good intentions merit ; and, having thus laid a foundation, I am contented to leave the question in the hands of the members of the club (Cheers).

Mr. CURTHERBERT W. JOHNSON said he happened to be one of the very few who some years ago met in that house, to consider the desirability of forming a London Farmers' Club ; and he thought the retrospect they

were now enabled to take of the proceedings of what might, in fact, be termed the Central Farmers' Club of the kingdom, might well encourage them to persevere in the course thus commenced (Hear, hear). One of the great arguments originally used in favour of establishing the club was that it would tend materially to promote that diffusion of knowledge, and that unity of action, the want of which had been so prejudicial to the agricultural interest. When other great interests conceived themselves to be affected by any public measure, they soon managed to be pretty unanimous (Hear, hear); and coming before the Minister of the day by means of a deputation, which expressed the feelings of a united body, whether they belonged to Manchester, to the iron district, or to any other section of the country, they seldom failed of success in their object. If a trade wanted opening in any particular direction, or if they required anything to which they had a rational claim, by means of union they generally obtained what they desired. Now he could not help thinking that such an association as the London Farmers' Club, viewed as a central club, was well qualified to secure similar advantages for farmers (Hear, hear). It might thus fill up the gap left by the Royal Society of England. One of the rules of that society was that nothing of a political nature should be discussed. This club was not so nice; for, among other subjects discussed by it were the corn-laws and the malt-tax. The question of statistics would again, he believed, be speedily mooted—a question which he deemed of great importance to farmers (Hear, hear). Parties engaged in the tea trade, in the iron trade, or in any other great staple trade or manufacture, were always anxious to get the best information with regard to stocks; and on that account circulars were distributed through the country, telling all who were interested in the matter how much tea, for example, how much coffee, or how much sugar there was on hand at a particular period. It was surely worthy of consideration—he did not mean to advocate one side of the question or the other—whether, if the farmers of this kingdom knew at certain seasons what was the supply of corn and of other articles, it would not be very advantageous to them in arranging their sales or purchases (Hear, hear). He found that different views of this subject had been taken by provincial farmers' clubs; but this very fact suggested the remark that if local clubs throughout the kingdom were to appoint some one or more of their members to attend a meeting of the Central Farmers' Club in London, a resolution might be arrived at on the subject which would have weight with the whole body of agriculturists, and the result would probably be beneficial to all concerned (Hear, hear).

Mr. R. BAKER said no one could doubt that the existence of a club, at which the intelligence of farmers might, as it were, be centralized, would be advantageous to the agricultural body generally; but whether it would be politic to engraft such a club on the present one was another question (Hear, hear). That club was originally instituted, not for the purpose of discussing such matters as were excluded by the Royal Agricultural So-

ciety and other associations, but with the view of bringing the leading agriculturists of the kingdom to one focus whenever they might visit London, so that they would be enabled to exchange their ideas for mutual benefit. After a time it was thought advisable that discussions should take place; and it was not until two or three years after they commenced that the discussions excited much interest, or secured a considerable attendance of members. An attempt which had been made to engraft the other clubs of the country upon the London one had been met by a reciprocation of sympathy, and by encouragement being given to members of local farmers' clubs to attend the meetings on certain conditions. There appeared, however, to be another object contemplated by many of the promoters of other clubs, namely, that the London Farmers' Club should entertain political and other questions which the local clubs were in a great degree precluded from discussing themselves (Hear, hear). As an old member of the club, he felt, and he believed his opinion was shared in by many of the old members, that an innovation of that kind would be dangerous; that it would be best to go on in the way that they had been doing, discussing subjects which affected the interests of the whole agricultural body, and steering clear of politics. He only differed from others, however, as to the mode of accomplishing the object. That a centralization of farmers for the purpose of considering unitedly the questions which most materially affected them as farmers was desirable, he felt as fully as did Mr. Ramsay; but he differed from that gentleman if he supposed that that club, having been formed for a special purpose, should now be extended so as to become politically, as it were, the great centralization of the farming interest throughout the country. He was here reminded of one question, which closely concerned all farmers. Perhaps there was no interest in the state worse represented than the farming interest (Hear, hear). They had no representatives of their particular interests in the House of Commons—(Hear, hear)—the county members in that house represented the landed interest, not the tenant interest (Hear, hear). With one or two exceptions there were no tenant farmers there; and consequently, whatever appertained peculiarly to the tenant farmer was comparatively neglected. It was only through that club, or one of a more extensive character, that in the present state of the representation any effectual pressure would be brought to bear on members of parliament in reference to any great question involving the interest of farmers. Many such questions had found their way into the House of Commons through the notoriety which had been given to them by that club, and among them is the question of tenant-right (Hear, hear). So long as farmers continued without proper representation, so long would the tenant-right question remain unsettled. He maintained that, whether in that club, or in any other which might be established, it was impolitic for farmers to entertain any political question, except so far as it affected their own immediate interest (Hear, hear). The farmer's interest had always been made a political football—(Hear, hear)—but, protection having been abolished,

they must now, like other citizens of the community, endeavour to take care of themselves. In conclusion, he could not help thanking Mr. Ramsay for having brought forward the subject in so able a manner; and though he thought that whatever might be done towards establishing a Central Farmers' Club should be done without interfering with the general proceedings of that club; yet he was also of opinion that if that club could give any assistance in the advancement of the principles which Mr. Ramsay had propounded, it should not be withheld. It would, he thought, be unwise and impolitic for the club to alter the system it was now pursuing: the result of any such alteration as that suggested appeared to him highly problematical.

Mr. PYLE (delegate from the Winchester Farmers' Club) said he had hoped to find the meeting in favour of the proposition that the London Farmers' Club should become the Central Farmers' Club of the whole kingdom. Mr. Baker objected to the discussion of political subjects. There was scarcely any subject bearing on the interests of agriculture that was not political; and they might depend upon it that farmers would never trouble themselves about any politics but those which did bear on their immediate interests (Hear, hear). He agreed with Mr. Baker that they were not represented in the House of Commons; and "the reason why," to quote an expression of Sir James Graham, was that they were often driven to the poll as sheep were driven to market. The Legislature must begin at the right end, by enabling landlords to charge their estates with improvements, and by enfranchising copyholds. The cultivators of the soil could not be expected to sacrifice themselves for the good of the community (Hear, hear); and, on the other hand, if they had proper security for the investment of their capital, the increase of production would proceed at a most satisfactory rate. He did not agree with those who contended that leases comprised all that farmers required; many other things were necessary to draw out the resources of the country. As regarded agricultural statistics, he was an advocate for everything that concerned farmers being made as open as possible; secrecy had been their bane (Hear, hear); and, if farmers had anything to communicate, it was their duty to impart it freely to each other. He hoped the meeting would not conclude without having come to an unanimous decision that the London Farmers' Club should in future be the Central Farmers' Club of the kingdom (Hear, hear).

Mr. J. C. NESBIT thought the remarks of Mr. Baker required some reply. Mr. Baker said the club was formed in order that there might be a place in the metropolis whither farmers, when they visited London, might resort, to discuss matters of common interest. He went on to say that the discussions were at first of a more private character than they subsequently became. They were then told that this silent system, or private system—

Mr. BAKER said he had not used either the word "silent" or the word "private" (laughter).

Mr. NESBIT continued: At all events, the result was that ultimately periodical meetings were held for discussion. After such admissions, he should have ex-

pected that Mr. Baker would go on to argue that still further improvements might be made; whereas he contended that, because the club was in the position it now occupied, they ought not to consider whether or not its advantages could be extended. Now, in his (Mr. Nesbit's) opinion, as the club was formerly made to include objects not contemplated at first, because a necessity arose for such an enlargement, so now it became them to consider whether, in the present state of things, it should not be extended so as to include a still greater variety of objects (Hear, hear). Again, Mr. Baker had stated that they were not allowed in that club to discuss politics. He believed there was, in fact, no such rule—he appealed to the Chairman to correct him, if he were mistaken; and, so far as the practice of the club went, he thought the principle by which it had been regulated was, that all subjects, whether political or non-political, that affected the farmer in his manipulations or calling in any way whatever, were fit and proper subjects for discussion by farmers (Hear, hear). If that were so, the club was already founded on a sufficiently large basis to admit all who were disposed to join it. The question really was, whether their regulations ought not to be such as to include as great a number of persons as possible—whether they ought not to open their arms as widely as was practicable; and if this were done, the club would, he was convinced, become one of the most important institutions in the world connected with farming. He deprecated their allowing such an opportunity for union to pass by. If they ignored the kindly spirit which was attempting to unite them with the cultivators of the soil throughout the country, he thought they would regret it (Hear, hear). His knowledge of the local farmers' clubs of the country enabled him to predict that, if that club did not assume the position which was now proffered to it, some other association would arise and take its place. One result of its becoming the National Central Club would be that, when any subject arose in which all the farmers of the country had a common interest, it might secure a discussion and decision in all the local clubs within a week, and thus obtain an expression of opinion which could not but be of the greatest importance as regarded results (Hear, hear).

The CHAIRMAN said, having been appealed to by the last speaker with regard to the existence or non-existence of a rule in that club excluding politics, he begged to say that, as far as his memory served him, there was a rule by which politics were prohibited. As regarded the correct definition of this word "politics," he could only say that, in his capacity as chairman, it had always been his object to confine the gentleman who addressed the meeting to the subject immediately before it.

Mr. SPEARING said, as a member of a local club, and also of the London Farmers' Club, he wished to see the club attain that eminence which he believed it could not reach without adopting the course suggested by Mr. Nesbit. There were, including himself, seven members of the Winchester Club in the room; and they

were all impressed with the desirableness of such a change. They wished especially for increased means of obtaining information. It was not convenient to them to attend all the meetings, and the only information they could obtain respecting the proceedings of the club must come through the columns of the *Mark Lane Express* or *Bell's Messenger*. It was at least desirable that they should in addition have the advantage of reading half-yearly reports of the committee (Hear, hear). He believed there were men in the club fully competent to give in that form sound opinions on the questions most interesting to agriculturists. The effect of making the club a central one would be to bind tenant farmers together as one man for the common good (Hear, hear).

Mr. HILTON said they had all heard a great deal about the want of union among farmers. It was owing to this "want of union" that they were not duly represented; and were that evil removed by means of a Central Club, farmers would soon be in a very different position. They all appeared to feel the desirableness of having a Central Farmers' Club. That point being settled, the next question was whether that association should be the Central Farmers' Club. He confessed he was one of those who thought that hitherto Farmers' Clubs had not answered the purpose for which they were designed; and he was anxious to see a reorganization of them, in order that they might take their proper position in the country. It was desirable not to multiply unnecessarily clubs of that description. The London Farmers' Club stood very high in general estimation; and justly so from the way in which it was established, from the men who had joined it, and from the discussions which had taken place at its meetings: and under these circumstances he should be sorry to see any new Club rise up to take its place (Hear, hear). He cordially concurred in what had been said with regard to tenant-right, but it was necessary to have a Central Club with a view to the satisfactory settlement of that question (Hear, hear). There could be no stronger reason for making this club the central one of the country than the fact that such a step would tend to give prosperity to the local clubs, which in many parts of the country required such aid.

Mr. CUSSENS, of the Arundel Farmers' Club, said he could not allow that opportunity to pass without thanking the Committee for the manner in which they formerly entertained the proposition for the admission of some of the members of the Arundel Club. They had now the privilege of sending two of their members, which was one step towards pulling together; but it was only the beginning of a good end (Hear, hear.) He hoped that in future they would all be allied more closely together, that their views would be expressed at the same time in different places, and that when any measures had to be considered which concerned their interests, they would be able to show the legislature that, although a scattered class, they were not incapable of exerting themselves for their own benefit, as well as for that of the community at large (cheers). He trusted that the club would not throw cold water on the appeal which was now made for united action, and believed that its doing so would

tend to wean from it the affections of the provincial clubs. He hoped he was not considered to be infringing the orthodox doctrine with regard to politics, if he referred for a moment to the malt-tax. That tax had been referred to by one or two speakers in a rather cursory manner. In his part of the country it was felt to be a great injustice to the farmer and the labourer (Hear, hear). A few months ago he was one of a deputation who waited on the Chancellor of the Exchequer to obtain its repeal; and he believed that one result of establishing a Central Club would be to secure the united action of farmers in claiming the repeal of that iniquitous impost (cheers). A public meeting was about to be held in Sussex, with the view of accelerating that end.

Mr. W. BENNETT confessed that the subject appeared to him beset with difficulties. He did not deny that the agriculturists of England required to be placed in a better position; but he saw great difficulty in the introduction of general politics in meetings of agriculturists. The line of demarcation ought, he thought, to be drawn at all matters relating to improvement. The burdens of agriculture were legitimate subjects for discussion by farmers' clubs; but whether the representation of the country and other matters of that kind should be included, was perhaps matter for serious consideration (laughter). They must take care not to act in a manner which would tend to make them ridiculous in the eyes of the community. Farmers' clubs must not become mere debating societies on all subjects which might come before the Legislature. He feared that the meeting would not be able to come to any practical conclusion that evening; and perhaps the best course, therefore, would be to refer the subject to the committee, in order that they might take it into consideration before the meeting in January. He should greatly object to the formation of a second club. If the basis of that club was not sufficiently large and liberal, it had better be extended.

The CHAIRMAN said: Having looked through the rules of the club since he last referred to the subject of politics, he wished to state that he could not find any rule on the subject. It had certainly been his impression that there was one.

Mr. CORBET, the Secretary, said the exclusion of politics was a matter of custom rather than of positive rule. When he came there, in 1847, the rule had reference to the question of protection and free trade. A notion seemed to have prevailed that evening that the club was afraid of touching on important topics; but he believed it would be found, on an examination of the list of subjects already considered, that there was scarcely one of any real import mentioned by Mr. Ramsay that had not been discussed (Hear, hear).

The CHAIRMAN said it appeared that the rule had died a natural death; but to show that, if any such rule had existed, the committee had not been very particular in enforcing it, he would remind the members that on the 7th of February last Mr. Cheetham was allowed to introduce the following question—"What course ought farmers, individually and collectively, to pursue under the altered circumstances of the times in which they were

placed?" If that were not opening the door to the most ardent he did not know what would be (laughter).

Mr. WALTON entirely concurred in all that fell from Mr. Ramsay, and trusted that the issue of the discussion would be highly beneficial to tenant-farmers. The time had come when they must look to their own interests, for thus only could they be secured. At present, farmers' clubs had done but little for the advancement of agriculture.

Mr. WOOD said, as an old member of the club, he hoped that nothing would be undertaken rashly. He agreed with Mr. Baker that it was a grave question whether amalgamation might not have the effect of damaging the club. At the same time, he considered the question worthy of the fullest consideration; especially as there was no other society on which the provincial clubs could be so well or easily grafted.

Mr. SIDNEY said the meeting appeared unanimously of opinion that it was desirable that a Central Club should be established; and no person who watched passing events could be surprised that such was the case. Having been in the habit of watching the proceedings of local farmers' clubs, he had observed them for some time assuming a more independent tone, and asserting a right to express opinions uninfluenced by landlords. They all knew that the landlords of this country had extensive and frequent means of communication. Educated at the same universities, belonging to the same clubs and societies, it was impossible that they should not have frequent opportunities of conversing together on topics in which they were interested. When tenants met their landlords on festive occasions (which they did generally only once a-year) it might seem ungracious to introduce politics; and a Central Club was needed to afford proper facilities for representing their views. This would be best accomplished by extending the operations of the London Club. They might begin by sending communications to all the local associations, asking them whether they would co-operate, what subjects they had discussed, what resolutions they had passed, and so on. That would be a great step towards the attainment of the object.

Mr. SPOONER, Secretary of the South Hants Farmers' Club, said it was a rule of that club to exclude all political subjects except such as had a direct bearing on the interests of agriculture; and he thought that in a Central Club such a rule as that would be quite sufficient to exclude everything that could lead to unpleasant results. They had long been convinced of the desirableness of having some better means of gathering the opinions of

agriculturists generally. He believed the establishment of a Central Club would prove highly beneficial.

Mr. W. FISHER HOBBS had to express his thanks to Mr. Ramsay for so ably introducing the subject. He (Mr. Hobbs) was not one of those who feared progression, nor was he for standing still while other institutions were progressing. That the Committee, too, had no such fear, was proved by their selection of such a subject for the most important meeting of the year. For his own part, he should be most happy to assist in carrying out the views of Mr. Ramsay; and as to the character of the discussions which might take place, he should trust to the good sense of the farmers of the country to send persons to represent them who would bring forward their subjects in a proper manner, and do justice to the cause they professed to advocate (Hear, hear). With this conviction, he had no hesitation in saying that the Committee would endeavour to make the Club what in fact it ought to be, a representative of the practical farmers of the country (Hear, hear). It behoved tenant farmers to unite together whenever any great question affecting the agricultural interest was under consideration, and not to be behind the other industrial classes of the country in expressing their minds frankly and intelligibly, not only to the public at large, but also, if necessary, to the legislature (Hear, hear).

Mr. CHEETHAM said, that in the paper which he read last February, he unwittingly introduced the subject of a Central Farmers' Club: in fact it had long been a favourite theme with him, and he hoped the time was not far distant when the object would be fully realized.

Mr. RAMSAY replied, and in doing so said he had no doubt that if the Club took the lead the Local Clubs would gladly assist in the attainment of the object which he had advocated, and a fusion would take place which would prove highly advantageous to all parties.

Two or three resolutions were then proposed; but, on the motion of Mr. W. Bennett, seconded by Mr. Payne, the following one was, after some conversation, which showed that there was scarcely any real difference of opinion, unanimously agreed to, the others having been withdrawn:—

"That this Meeting is of opinion that the London Farmers' Club should act as the Central Farmers' Club of the kingdom, and that the Committee be requested to take into consideration the best means of carrying out this resolution."

On the motion of Mr. Tattersall, seconded by Mr. Nesbit, a vote of thanks was given to Mr. Ramsay.

On the motion of Mr. Sidney, seconded by Mr. Payne, a similar acknowledgment was made to the Chairman.

This terminated the proceedings.

THE ANNUAL DINNER OF THE LONDON FARMERS' CLUB.

On Thursday, Dec. 7, the annual dinner of the Club took place at Radley's Hotel, Bridge-street, Blackfriars. The Chair was taken by Mr. Trethewey, the President of the past year, supported by nearly a hundred members and their friends, including Lord Berners; Mr. Pusey,

President of the Royal Agricultural Society; Mr. W. Fisher Hobbs, Mr. R. Baker, Mr. Ramsay, Mr. C. Johnson, Mr. Skelton, Mr. Tuxford, Mr. Barthropp, Mr. Bidwell, Mr. W. Cheffins, Mr. H. Cheffins, Mr. Tattersall, Mr. Bullock Webster, Mr. Grainger, Mr.

Burton, Mr. W. Pain, Mr. J. Wood, Mr. Purser, Mr. Shearer, the Rev. Mr. Day, and many leading agriculturists.

After the usual loyal and national toasts,

The CHAIRMAN proposed the toast of the evening—"Success to the London Farmers' Club." In introducing this toast he did not think it necessary, he said, to offer any remarks. He preferred leaving the subject in the hands of the gentleman who had been deputed by the committee to respond, feeling quite convinced that he would do it amply justice. He could not, however, refrain from congratulating the members on the improved position of the Club as compared with that which it occupied on previous occasions of the same kind. He believed he was correct in stating that during the past year there had been an increase of something like fifty members, and that at the present moment the funds were in a flourishing condition (cheers).

The toast having been most enthusiastically received,

Mr. BAKER rose to respond. He hoped that what he had to say on that occasion would be received in the spirit in which it was uttered. He had from the commencement of its career had the welfare of the Club at heart, and, like others with whom he was associated in the management, had constantly endeavoured to support it to the best of his ability. That the Club had improved he thought could not be denied, whether they regarded the accession of members, or whether they considered the important position which the Club now held in relation to the agricultural community (cheers). Though much remained to be done, yet much had already been done in the advancement of farming pursuits. The rapid strides which had recently been made by agriculture, the application of science as a means of attaining the end in view, and the increased capital which had been brought to bear on cultivation had already produced a large amount of public benefit (Hear, hear). Whoever looked over the face of the country would find evidences of advancement. Farming had improved to an unprecedented extent within the last ten years; and it was his own opinion, and he knew it was also that of many leading agriculturists, that if proper facilities were enjoyed by the tenant, and especially if adequate security were given to him for the investment of his capital (Hear, hear), such were the resources of this country that he would be enabled to produce sufficient food for all its inhabitants (Hear, hear). It was true that this had not been done for some years; but when they looked round, and observed the vast extent of land that was still uncultivated, and when they saw what a large proportion of land was only half cultivated, they could not help coming to the conclusion that, with the capital which this country possessed, and with the advantages derivable from foreign and artificial manures, the agriculture of this country might soon arrive at a much greater degree of excellence (Hear, hear). In agriculture, as in other pursuits, there was constantly being employed a large amount of capital, the return from which could not be realized in one year, two years, or even three years, but

must be looked for at a comparatively distant period. Consequently, persons having capital at command were naturally desirous of ascertaining how it might be invested with security to themselves and their successors; and, so long as the law was deficient on that point, so long would there be an indisposition on the part of cultivators to invest very largely in agriculture. The question might well be asked, why security was not enjoyed? What was there in the nature of things to prevent the farmer from reaping where he had sown, as well as any person who was engaged in a commercial enterprise? (Hear, hear). The interests of the landlord, the tenant, and the labourer were said to be identical, and no doubt they were so; but the system which prevailed had the effect of placing each in an isolated position (Hear, hear). The landlord looked to the farm merely as the source of the income out of which he maintained his establishment; the tenant looked to it merely as the means of providing for himself and his family; the labourer expected his share of advantage, and, if the tenant reaped a large amount of profit, the labourer looked for a proportionate amount of wages. The three were all, like a bundle of sticks, bound up together; and the system ought to be such as to benefit all. But there was a principle in operation which was inconsistent with this. The principle of leasing land was in itself a good one, but it was not carried out to the extent that was required for the benefit, not merely of the occupying tenant, but of the community at large. A man, for example, took a lease for twenty-one years: that term might appear long enough to enable him to realize whatever he ought to from the investment of his capital. Supposing, now, the farm to be, as was generally the case, in a dilapidated state as regarded cultivation, it would take him seven years to bring it into a proper condition. In the next seven years he still went on improving; and in this period he obtained, perhaps, some return for his outlay. But what would be the result if he continued improving to the end of the term? Why, that he would then have to pay an increased rent, or to resign the farm to some other person, who would pay an increased rent, in consequence of the state into which he had brought it. Therefore, in the last seven years he set about taking out of the farm just as much as he had put in, in the first seven. The result was, therefore, that at the termination of the lease the farm was in no better condition than at the commencement; neither the landlord, the tenant, nor the country was permanently benefited by the improvements (Hear, hear). Now, if the principle were established of guaranteeing to the tenant a sum equivalent to the value of the permanent improvements which he had made in the soil, and in proportion to the improvements which remained unexhausted, a large amount of benefit would be obtained by the community at large; and agriculture, instead of retrograding, as it frequently did, on particular farms and in particular districts, through the system which he had described, would exhibit all the advancement which intelligence, skill, and the application of capital could secure for it (Hear, hear). On this point, however,

he would not trespass further: he would now confine himself to the object of the club. That object was to collect men from various districts of the kingdom, to bring them together into one focus, and to secure an interchange of ideas; so that it might be ascertained how far the principles of cultivation carried out in one district coincided with those carried out in others, and that by comparison and discussion they might all be led to adopt what was sound and to discard what was unsound. (Hear, hear.) There were dispersed over the whole kingdom associations called Local Farmers' Clubs, in which questions of a similar nature to those entertained by that club were debated; but unfortunately the resolutions, as well as the discussions, were lost to the public at large, because there were no adequate means of disseminating them. Now it had been suggested that this club, instead of being, as hitherto, merely the London Farmers' Club, should become a club of centralization for all other clubs; so that such questions as had been discussed in the local clubs should in future be discussed there by the united body, and thus be brought before the public in the form most likely to prove beneficial. It was undoubtedly desirable to get rid of that isolation which had been such an impediment to improvement, and that the intelligence of farmers in particular localities should be combined, concentrated, and circulated in a condensed form, for the benefit of the whole body of agriculturists. In the hope that this object would be secured, he begged to thank them, as one of the oldest members of the club, for the manner in which they had received the toast; and he hoped that, in the remarks which he had made, he had managed to steer clear of politics, and had said nothing which could be considered offensive to any one (cheers.)

Lord BERNERS said he was about to propose a toast which he was sure would be acceptable to all. It was his misfortune not to have been able to attend any of the discussions of the past year, and he was therefore incapable of duly appreciating the merits of the chairman of the day. He was, however, informed, that at all the meetings he had conducted himself entirely to the satisfaction of all present, and that he had contributed greatly to the usefulness of the club—(Hear, hear)—and he was quite sure that the manner in which he had presided on that occasion would obtain for his health a cordial reception (cheers). He should not be acting in accordance with his feelings if he did not say how gratified he was at hearing the chairman speak of the prosperous state of the club. The fact that there were fifty new members within the last year was particularly gratifying to himself as one of the oldest members of the club, and as one who, for several years before it was instituted, strongly advocated the establishment of a London farmers' club, feeling that it was highly desirable that there should be some place where practical farmers could meet, and, in the absence of politics and party feeling, talk over matters in which they had a common interest. He had heard it hinted that the club was in future to form a sort of nucleus, and that invitations were about to be sent to local clubs to join it, or to enter into correspondence with it. All he could say was, that if anything of that kind should

occur, he should be most happy to do anything in his power to promote the object (cheers). Mr. Baker, who on all occasions spoke with credit to himself and with advantage to those who heard him, had remarked that this country was able to provide food for its population. This was an opinion which he (Lord Berners) had held for many years. It was, too, an opinion which, when a boy, he had often heard expressed by that great patron of agriculture, the late Lord Leicester, at the splendid meetings which took place at Holkham: year after year had he heard Lord Leicester say that if the wastes were enclosed, and if agriculture were properly encouraged, farmers would be able to meet all the requirements of the population, however great they might be. He (Lord Berners) had no doubt that such was the case still. At the present moment, if they looked only to the returns of the produce of the soil, there might be doubts on the subject, but those doubts would not be entertained by practical men who looked into the question. He knew very well that there was not so large a wheat produce this year as there had been in many preceding years, but there were certain causes which had led to that result. The price of wheat had not been so remunerative as formerly; other crops were for some time more remunerative than wheat; and he was sorry to add that one reason why the wheat produce had not been so great as at previous periods was that, owing to the distress which had prevailed in some quarters, some of their agricultural friends had been obliged to scourge the land. (Hear, hear.) It had been remarked, in various parts of the country, that farmers should be called upon to give in a statistical return of their crops; that, if that were done, speculators would know what to do, the government would know what to do, and the result would be advantageous to the nation at large. He, for one, had no objection to make, as far as he was able, a return of everything that he produced. He did not give any opinion on the question—he did not encourage others to imitate him; but, if called upon, he would himself make the return as faithfully and as justly as he could. But if they were called upon for statistical returns—they who had to support so vast a proportion of the poor of this country—then he thought similar returns should be required from other producing classes. (Hear, hear.) One word in allusion to Mr. Baker's remarks respecting the last seven years of a 21 years' lease. At one of the agricultural meetings in Norfolk that question was mooted. An old friend of his said, in a rather jocular way, that he had been travelling in Wales, which was not very conspicuous either for good breeds of cattle or for good farming. Some people there said to him, "There is a gentleman living close by here, who is a most superior agriculturist." "Well," said he, "I have been looking at animals of different sorts, and I can see no good ones; and if there is a really practical man, such as the farmers of Norfolk or Suffolk, I will go almost any distance to see him." The distance being only two or three miles, he went. He found the farm in a state of which any of themselves would have been ashamed. But what said the occupier? "I have," said he, "a twenty-one years

lease. In the first seven years I did all I could to increase the produce; in the next seven years I tried to get as much out of the farm as I could; in the last seven years, of which there are only one or two years to run, I am doing all I can to get back what I put in, lest I should have my rent raised." (Laughter.) With regard to statistics, he was happy to see present the president of a society which had taken very great interest in a question to which he was about to allude, that of guano. He had seen in the newspapers a report from the Admiral on the Peruvian station, to the effect that in all probability the remaining quantity of guano would not be sufficient to last more than eight or nine years. The Royal Agricultural Society had done its best to obtain from the Peruvian government, and indeed from every other available source, a supply of guano for the British farmer on the lowest possible terms, and in this object they had had the support both of the late and the present government. In looking at the return of exports and imports which was published only a few days since, he found that in the ten months ending the 5th of November, 1851, the importation of guano amounted to 182,893 tons; that in the corresponding ten months of 1852 it was 113,951 tons; and in the same ten months of the present year it was only 88,961 tons. He was one of the deputation who went to Lord Derby to complain of the price. On that occasion his lordship observed, that the increased imports of guano having shown the Peruvian government that they could command their own price, they could scarcely be expected to lower it. Against that was now to be set the fact that, whereas the importation in the first ten months of 1851 was, in round numbers, 180,000 tons; in the corresponding period of 1853 it was only 89,000 (Hear, hear). Statistics were always, he knew, considered dry, but still it was necessary that such facts as these should be known by agriculturists (Hear, hear). It was important to know what supply of beef and mutton was obtained from abroad. In the first ten months of 1851 the number of oxen, cows, and calves imported was 67,630; in the corresponding ten months of 1852, the number was 75,665; during the same period in the present year the number was 89,316. If they looked back to former years, they saw from what a small beginning the importation of cattle had risen; and there could be no doubt that with good prices foreigners would continue to supply this country with an immense quantity of cattle. The number of sheep imported during the first ten months of 1851 was, in round numbers, 141,000; in the first ten months of 1852, 183,000; in the first ten months of 1853, 170,000. There was one other point to which he begged their attention, as it bore on the price of wheat. He perceived that in 1848 they had in bond 665,000 qrs. of wheat and 515,000 cwt. of flour. Now during the last two years they had had no wheat in bond. Such facts as these ought to be borne in mind by farmers, and should guide them as to their time of selling out; it was with that view alone that he mentioned them. In 1848, when there was such a large quantity of corn in bond, the price was low. He found that the quantity of corn imported in 1851 was 2,202,000 qrs.; and in the first

six months of this year, with the stimulating price of seventy or eighty shillings, though they had had all the world to go to, and though, as he knew to be the fact, every effort had been made to introduce wheat during that period, all that could be imported into this country was 2,060,000 qrs. It appeared that there had been a greater importation of wheat during the last three months. He was told also that it was probable that during the next fortnight or three weeks there would be a sort of clearing out of the northern ports, and that this would lead to a very large importation. But after that, from the best information he could collect, and he had taken the best means of informing himself on the subject, he believed it was not till very late in the spring that there could be any considerable importation of wheat. (Hear, hear). The system of draining which he (Lord Berners) pursued had been put before the public in a manner which he had never contemplated. He claimed no merit on account of it; for it was, in fact, no novelty. His object in instituting draining matches in his own county was, he confessed, partly to collect information from practical men who had adopted different systems, and having gained all the information he could, to apply it on his own estate (laughter). All he could add on this subject was that if any five, six, or ten members of the club were disposed to visit his estate with the view of ascertaining whether or not the system which he adopted was a good one, he should be most happy to offer them the best hospitality that he could command (cheers). He had been told by strangers who had ridden over his land at this season of the year—he ought to mention perhaps that they were hunting gentlemen, and knew no more about farming than that orange (holding one up)—(laughter)—that they always rode over his land very pleasantly (laughter). The noble lord concluded by proposing the health of the chairman, which was drunk with the honours.

The CHAIRMAN said he could not but feel highly gratified, both at the kind reception of the toast and at the manner in which the noble lord proposed it. He could assure the company that it was not without considerable diffidence that he undertook to fill the post which he then occupied; and, had he not learnt from his experience of the members of the Club during the last twelvemonth that he might venture to draw very largely upon their indulgence, he would not have undertaken to appear in such a position. It was with the feeling that every member of the Club was expected to perform the duty which devolved upon him, that he had consented to act; and, having secured the approval of the company, he should feel amply repaid. He again thanked them for the honour they had done him (cheers).

Mr. SHEARER proposed "The Royal Agricultural Society of England, the Highland and Agricultural Society of Scotland, and the Irish Agricultural Improvement Society." He felt very great pleasure in seeing near him the president of the first-named of those societies—a gentleman who had done more, he believed, to promote good management in agriculture, than any one

in the country; and he should couple the toast with the name of Mr. Pusey (cheers).

Mr. PUSEY, on rising to respond, said he had felt great pleasure in accepting the honour conferred upon him by the invitation to attend on that occasion; independently of which he should have felt it right, holding as he did the official situation of President of the Royal Agricultural Society, to attend the annual meeting of a sister society, which filled up a most important gap that would otherwise exist (cheers). In saying this, he recollected that while the Smithfield Club had for many years encouraged fat cattle, the Royal Agricultural Society proposed to encourage breeding cattle; though he confessed he could not see much difference between the cattle of July and the cattle of December (laughter). Whether in Parliament or elsewhere, he always felt more disposed to listen than to speak, and he had little to offer on that occasion. He cordially concurred in what had fallen from Mr. Baker and Lord Berners with regard to improvement. The three societies named in the toast had no doubt succeeded in greatly improving the agriculture of the country during the last ten years; but there was still a great deal to be done. There was a great deal of discovery yet to be made, and a great deal to be done for the diffusion of the discoveries which had been made (Hear, hear). There was still a large quantity of land to be drained; there were a great many hedges to be removed, or reduced in size, and a great deal of couch to be rooted out. But a few years ago, foreign guano was shown in this country by a merchant as a great curiosity; they all knew to what an extent it was now used. He could not help expressing his cordial concurrence in the remark that, instead of importing foreign corn, they should import foreign manure. This appeared to him a singularly happy termination of the long differences between protectionists and free-traders (laughter). During the progress of the dispute, it so happened that a foreign manure came to light, which would enable farmers to grow a supply of corn for this country that they otherwise could not have produced. The free-traders asked them to import corn; the farmers said, "No, we would rather import manure, and grow corn ourselves." The free-traders said, "By all means;" and so the question was settled honourably for all parties (laughter). He heartily wished the supply of guano were not a monopoly. The Royal Agricultural Society was going to call upon the Government once more to use their influence with the Peruvian government; but he feared that the task would be difficult. With regard to the supply of guano, he was not sure that the information which had lately reached the Admiralty might not lead to a wrong conclusion. He believed the report was confined to the Chincha Islands—that it was in reference especially to those islands, from which the chief supply had been lately derived, that the Admiral said there was a supply for only nine years. He was strongly inclined to think that so far as those islands were concerned, the Admiral was right. He (Mr. Pusey) had been told that an unfortunate Peruvian had been thrown into prison for saying that there was a supply for only about nine years; and

the Peruvian government would probably not have been so sensitive, had not this gentleman spoken the truth (laughter). They should not lose sight, however, of the Lobos Islands, which the American government last year showed a disposition to appropriate, and from which he imagined a large supply might be obtained. He could not help observing too, that in the same region of the world had been discovered nitrate of soda, the properties of which were such, that if a railway were constructed for its transit, it might come into important competition with guano (Hear, hear). He had to return thanks on behalf of the Highland Society of Scotland. This reminded him that on the last occasion of that kind, he indulged in a kind of challenge to the farmers of the East Lothian. He wished to take that opportunity of saying that he had not intended the slightest disrespect to the Scotch farmers (Hear, hear). All he wished to do was to discourage the prevalent disposition of Englishmen to decry their own countrymen, and to hold up the East Lothian farmers as superior to any English farmers (Hear, hear). He should be exceedingly sorry to be supposed for a moment to depreciate the farmers of the East Lothian; he was quite ready to admit their high spirit and their equality with English farmers (Hear, hear). He was bound to acknowledge too, that on the former occasion, he was mistaken in imagining that it was good land only that was so well farmed in the East Lothian. Having been there since, he had discovered that the Scotch farmers, like those of Lincolnshire, had in many instances improved and brought to a state of great fertility a very inferior soil. It was a little more difficult for him to return thanks for Ireland than for Scotland; not having visited that country, and not having heard hitherto of any signal instance of improvement there. But he really believed that Ireland was on the eve of improvement, and land which a few years ago, was selling for ten years' purchase was now selling for twenty years' purchase. He thought that a young man who had thirty or forty thousand pounds could not do better than invest it in land in Ireland; and he knew some persons, who, having bought land in that country four or five years ago, had lately been offered for it double what it cost them. In conclusion, he would remark that he did not look forward to a continuance of the present high prices. He trusted that the present prices would not lead any gentleman to relax in improvement; that they would not prevent landlords from draining their land, and getting ready for a rainy day or a fall of prices. Though they had reason to congratulate themselves on what had been done, they had also reason to continue their exertions in future.

Mt. SIDNEY proposed "Success to the Smithfield Club;" a club which, he said, deserved to be honoured for its exertions to feed the increasing population of the country.

Lord BERNERS returned thanks.

Mr. J. C. NESBIT said he had a toast to propose which he was sure would have a most cordial reception, namely, "Success to the Local Farmers' Clubs." Connected as he had been for some time with those associations, he was well able to appreciate the efforts they

had made for the advancement of agriculture. They all knew that, unless the points of difference among agriculturists were mooted and argued, it was impossible that they could arrive at the truth; and that unless there were societies formed expressly for the purpose of arguing those points, of comparing varieties of practice, and of stating the results of experiments, it was impossible that the improvement of agriculture should be widely extended. They had heard that the Royal Agricultural Society of England was founded chiefly for the improvement of lean stock and the recording of facts, and that the Smithfield Club was founded for the purpose of securing good Christmas beef and mutton. It was necessary, however, that there should be some provision for the discussion of those points which were inadmissible in the societies which he had mentioned, and which were interesting to farmers as a body. The London Farmers' Club alone was insufficient for that purpose; there was needed a widely-extended ramification of associations, in order that in various parts of the country various points of importance to agriculture might be thoroughly and soundly discussed. Hence the importance of farmers' clubs, which had been viewed by him with great interest from the earliest period when he became connected with agriculture. Within the last fourteen years he had founded fifteen or sixteen clubs of that description, in order that farmers might be brought together to discuss the practice of their district. Of that number, he was sorry to say six or eight had gone down for want of means of support. They all knew how great a difficulty there was in keeping farmers together. Farmers were not accustomed to meet together for intellectual discussion; after they had sold their corn, or transacted other business, they were very reluctant to discuss matters connected with their practice and experience. And hence, even after a club had been formed, he had found that, after the lapse of a year or two, and when the novelty of the thing had worn off, there was very great difficulty in keeping local clubs together. The difficulty was owing, in a great degree, to the want of association with other societies. Hence he hailed with great satisfaction a motion which was passed unani-

mously at the meeting of the London Farmers' Club on the previous Tuesday evening, by which the committee were empowered to make that club the Central Farmers' Club of the country, or, at least, in relation to all who might choose to join it (cheers). He considered that movement the most important one that had ever been made, whether as regarded the London Farmers' Club itself, or as regarded the local clubs scattered over the country. They had too often heard it said that the farmers of the kingdom hung together like a rope of sand; they would now be able to see whether this was for want of the principle of cohesion in the particles, or only for want of an opportunity of combining (Hear, hear). If the object were carried out, one important function which the London as the central club would be able to discharge was that of collecting, as it were, the intelligence and information of farmers in all parts of the country on any question which might arise; and the result would, he was convinced, be beneficial to the whole body of agriculturists. He begged to propose "The Local Farmers' Clubs," coupling with the toast the name of Mr. Lear, the chairman of the Arundel Club.

Mr. LEAR, in returning thanks, contended that one of the chief objects of the central club should be to secure compensation for permanent improvements, and strongly advocated amalgamation with the local clubs.

Mr. RAMSAY gave the "health of the Vice-President" (Mr. Baker), who was, he observed, one of the oldest and most intelligent members of the club. Mr. Ramsay then went at some length into the subject he had already introduced at the Discussion Meeting, to the Report of which we must refer.

Mr. BAKER made a brief acknowledgment.

Mr. TATTERSALL proposed briefly and appropriately "the Committee of Management"—as becomingly acknowledged by Mr. BULLOCK WEBSTER.

The CHAIRMAN then gave "the Secretary," to which Mr. CORBET laconically responded; and Mr. CROLE having acknowledged a similar compliment to "the visitors," the Meeting broke up.

W H E A T S O W I N G — C R O P 1 8 5 4 .

It is an old saying, and no less old than valuable, that "experience is the best schoolmaster"; and it is to be hoped that the lesson which the last year has taught us will not be lost sight of, in the hurry of laying down the wheat crop of the ensuing one. Seedtime is always a busy season, and the getting in of winter wheat after a late and wet harvest like the past is more than usually so; for on such occasions the harvesting of root crops and the tying-up of feeding stock come upon the farmer at the same time, engrossing not only much of his own attention, but also the time of almost all the spare hands he can muster, leaving the wheat-field less cared for than it otherwise would be; hence the consequences that follow, too many of which were last year experienced.

Let us very briefly examine, therefore, some of the casualties to which winter wheat is subject from the improper preparation—seeding and draining of the lands just adverted to, with the view of eliciting the best means of obviating losses.

Sowing winter wheat is a very nice work, requiring all the skill and assiduity which can be brought to bear upon it, and not unfrequently more, if possible, to conclude it successfully. It is a work upon which the weal or woe of every nation depends, according as it is properly or improperly performed, and therefore one which ought never to be neglected or entrusted to second-rate hands as a common concern; for if the ridges are improperly ploughed, or any part of the work carelessly done, the

result is often ruin to the whole. In some cases where the land is naturally dry, and not subject to water stagnating on it, the work is surrounded with fewer difficulties; but, unfortunately, the principal area of land under wheat is composed of heavy clays, subject to the stagnation of water and all the consequences which follow, some of them absorbing and retaining, by affinity, a quantity sufficient to destroy wheat plants, unless timely removed by evaporation.

The great lesson which last year taught us is the stagnation of water in the soil, literally drowning a large portion of the wheat plants of that year's sowing. According to the concurrent testimony of the provinces, about one-fourth of the whole number perished during the floods of winter; an awful mortality certainly, when we take into consideration the fact that it comprises the bread-corn, or staff of life, of the British people. Now, why was it that the one-fourth perished, and not the whole? By which of all the physical laws of nature was the life of this plant preserved, while its nearest neighbour, it may be, fell a sacrifice to the inclemency of winter? If one-fourth of a ship's crew perish in the tempest along with the vessel itself, the mind is easily satisfied as to the cause of this mortality, but a second naturally arises, how were the lives of the others preserved? Just so is it with the wheat plants of last year's crop. But then we come to a very important difference; for the mariners, whose lives are preserved, inform us themselves how they were saved: one, for instance, tells us that he got hold of a plank, a second an oar, a third a mast; a fourth, more robust than the others, braved the tempest, and swam to land, or was picked up by some other vessel; and so on for the others, each telling his own particular story. But wheat plants are silent, leaving the farmer to tell their story; and what does the farmer say?

Were agriculturists in the different provinces to answer the above question, stating in detail the meteorological phenomena, so diversified in the British isles, as experienced last year, the geological, mechanical, and chemical qualities of soils no less varied, and the whole agricultural particulars, including the death of those plants that perished, and the preservation of those that survived the storm, as well as the preparation, sowing, and drainage of the lands, it would form a more valuable and interesting report than all the Blue Books which have been issued by Parliament during many years past. Such a report would show that it was not always in the wettest climate, or in the field where the most rain fell, that the greatest damage was done, but where the lands are the worst drained. "There is always some water where the ox drowns," it is said; and, on examination, it will also be found that there is always water where the wheat plant drowns, which ought to be removed. The foot-prints of the teams in ploughing and harrowing the field, for instance, may hold a sufficiency for this purpose; for in them plants will perish, while those adjoining on the elevated ground not only survive, but prosper luxuriantly. Hence the reason why the last furrow in ploughing the ridge should be drawn with the horses "tandem," or the

one before the other, both walking in the furrow; why many practical men of the old school continue to plough the whole ridge with their teams walking in this manner, objecting to working abreast, because it poaches the unploughed land; and why, in harrowing, the horses are also made to walk in the furrows. Again: hollows in the ridges will do it. Such are of frequent occurrence; and since parties began to trust in imperfect under-drainage and broader ridges, it has been a growing evil. Last winter we travelled, on more occasions than one, through the principal provinces of England, and witnessed an immense amount of damage from this cause. In some cases of very tenacious clays the water was to be seen standing in shallow pools or lakes upon the surface, while in others the eye was attracted to the hollows by the bleached and discoloured appearance of the plants. In both cases there was a stagnation of water; and although it made its appearance upon the surface in the former case, yet that is no argument that there was less water and damage in the latter, for it may have arisen from the greater stagnation of water in the furrows, and from various other causes, as diversity of soil, inclination, &c., &c. In a third case, the dead plants were to be seen equally dispersed amongst the living, showing that in this example there is stagnation from furrow to furrow, the water standing to a less or greater depth, according to circumstances. If we suppose the furrows immersed to half their depth in the water, that the seed of one-fourth of the plants was deposited below this level, and that the remaining three-fourths of the seed were above it, then we shall have no great difficulty in accounting for the destruction of the former, and preservation of the latter—the more easily so, if the young plants had not established themselves in the soil before winter, and were, therefore, dependent upon nourishment from the seed now immersed in the water. In a fourth case, imperfect water-furrowing ruined the crop. Low-lying, level lands are the most subject to the last two calamities, and also to a fifth—imperfect river-drainage, when the fields are entirely covered with water. And in a sixth case, the ridges in many places of the field run across the declivity, so that their upper halves suffer from the stagnation of water. Such is the manner in which the wheat plants were drowned, and such the story of those which survived the wreck of last winter, so to speak. But perhaps the most interesting and valuable part of such a report would be the different practices pursued for the purpose of obviating the former calamity—the drowning of wheat plants in winter—a few of which we shall briefly glance at.

Our forefathers in the olden time adopted broad ridges, greatly elevated in the middle, and crooked, often, according to geological circumstances, with deep furrows for carrying off the water. Such may yet be seen in almost every province, from Cornwall to Caithness. In Ireland, again, we have the "lazy bed" system—a narrow bed or ridge, from six to nine feet in breadth, with a deep furrow dug between every two with the spade or "*loi*." The age we live in is loud in its pretensions to science and utilitarianism; but the

fact is, that our forefathers were just as scientific and utilitarian in their own time as we, suggesting the propriety of not boasting too loudly of our own attainments, for the lazy-bed system was the first system of furrow-draining, if we can believe Irishmen—one which has not yet been superseded by a more utilitarian; while our crooked ridges may with equal justice lay claim to the Keythorpe system as its offspring; for in many cases, if not the majority, they are, or rather were, formed on the geological ridges, on which that system is based; the open ditches at the bottom running across them, cutting the strata, and removing the water from between. It is among the oldest things we recollect of draining, of hearing our grandfather, upwards of thirty years ago, drawing attention to those strata, and the propriety of cutting them with drains and ditches; and we ourselves, and our father before us, have ever acted upon it since. To suppose that our forefathers were not men of observation, and cognizant of facts of this kind, is absurd. The golden maxim of "science with practice" was often better observed by them than by us, so far as the removal of the water from the wheat-plants, and their preservation from drowning during the winter months, are concerned: under the lazy-bed system, more particularly. In short, last winter proves that by our modern system of draining in many cases we drown our wheat; while under that of our forefathers it would have been preserved, comparatively speaking.

The lesson which we learn from the lazy-bed and crooked ridge systems is not to drown our wheat in winter; and the means to be used for effecting this important desideratum are—to keep the water in our water-furrows below the arable lands, or bottom of the furrows of the ridge; our ridges better curved, both above and below, on the subsoil as well as the surface, so as to prevent the stagnation of water; and to sow seed on a more equally prepared bed (we do not mean a fine mould) so as to prevent any of it from sinking too deep in the soil, which is best done by the drill or dibble, preceded by a sufficiency of harrowing. Our theories are becoming too fine-spun, as it were, for the wants of practice; so that in putting wheat into the ground we must look more to the demands of the young plants than to please the eye of the ploughman or his master; for how often do we find the ridge scooped out in the ploughing, concave towards the centre or crown, both top and bottom, instead of convex or rising in a curved form, as if purposely to effect the stagnation of water! It takes a good hand to keep down the first four furrows forming the crown, and up those forming the middle of the half ridge, so as to secure a proper curve, and avoid the dishing of the subsoil for holding water in the manner just noticed. In doing so it too often happens that the last furrows at the "outcasting" are drawn a little narrower, and of less depth, leaving the subsoil towards the furrow higher than half-way towards the crown, committing the very mistake of which we complain. Instead of this, the last furrows should be the deepest, and the water-furrows after sowing below the whole, as in the case of the lazy bed and "old-

gathered ridge," and finished with the spade. It is not enough to go over the cross furrows only with the spade; for those between the ridges should also be cleared out from end to end, throwing the whole of the loose earth into hollows, and leaving the furrows so that no water will stagnate in them from the crumbling of the earth after frost. A man, if the ploughing has been properly performed, will go over nearly an acre per day; and this, although a little out of pocket in the shape of expenses, falls short of a tithe of the losses experienced from drowning and its consequences. The last year may be quoted as a sufficient guarantee for the soundness of this conclusion. The work could be done by the "task" at so much per furrow or acre, according to the nature of the ground and amount of labour required in cleaning and bevelling off the edges of the open furrows to prevent them crumbling in by the action of the weather. To trust to under-draining on tenacious clay soils, in the vast majority of cases, is yet to lean on a broken reed. We speak with all possible deference to science, and the progress she is making; but, at the same time, for the information of those of her pupils who are prone to sneer at the cautious habits of practical men before they get through their own curriculum.

Many practical farmers, as well as amateurs and men of general scientific attainments, are making laudable efforts to acquire a thorough knowledge of the art of under-draining; but more progress must yet be made before their labours can be depended upon, for the removal of floods in winter and spring from tenacious clay soils, and even many soils not so very tenacious. Until such floods are removed by under-drains as fast as they fall, we must be excused for endeavouring to carry out and improve upon the practice of our forefathers, who removed them by means of open drains or furrows. Much is accomplished by narrow ridges, they being more easily curved, while they reduce the volume of water, and hence the damage done by it in traversing both ridge and furrow; but narrow ridges of themselves are not enough, for more attention must be paid to the furrows than was done last year, before our wheat plants can be considered safe.

Autumn weather in the southern provinces of the United Kingdom is generally propitious for getting in wheat; but in many of the northern provinces of this and the sister country it is otherwise, for there the weather can never be trusted to, after September, on clay soils. After the first of October, fallow wheats are got in as fast as possible, and the water-furrows cleared out immediately. If this work is neglected or overtaken by heavy rains and improperly finished, a loss of from ten to twenty per cent. is of frequent occurrence. Wheat after potatoes, beans, and turnips is sown as fast as the land is ploughed in doubtful weather. Indeed, the best farmers make it a rule not to trust the afternoon yoking with the morning work, every ridge being sown and water-furrowed as fast as ploughed, finishing up the whole at night as if no more wheat were to be sown that season. On such occasions the harrows and sower or machine follow at the heels of the last ploughman towards the close of the afternoon yoking—the ploughs

turning back and opening the furrows—a work never deferred until to-morrow, while men are pushing forward the cross or “gaw furrows” with the spade close up to the unploughed land. In ploughing for spring corn in such climates, there is always a man for so many ploughs, on the best conducted farms, whose duty it is to keep the cross-furrows open. These are never allowed to get closed for a single night; and the economy of labour (to say nothing of the consequential profits) is obvious, for, if cleared out when newly-ploughed, the work can be done at half the expense which it would cost afterwards, especially if overtaken by rain. To many, such rules may appear somewhat particular and arbitrary; but to those accustomed to them, and who experience their benefits and necessity, it is otherwise, for they would be surprised to hear of water-furrows being allowed to lie for weeks in November not cleaned out with the spade. They would immediately conclude that they who trusted to the weather thus deserve to have their wheat plants drowned in winter.

Harrowing the plastic clays of Surrey, immediately

after being ploughed wet in November, would doubtless be considered by some of our neighbours rather premature work. At the same time, it must be admitted, in years like the past, that it was perhaps the best of the two alternatives to choose; for if the seed can be got covered when the land is newly ploughed, and the horses kept in the furrows, less injury is sustained than some may imagine, who have never tried the practice. In ordinary seasons, however, of dry weather, it is not to be recommended. This year furnishes numerous examples where lands ploughed wet, about the end of last month, were sown in fine order by the middle of the present (November). But the mode of keeping the water-furrows open in unpropitious climates is deserving of our imitation, both on the score of economy of labour and utility as to produce.

In conclusion, the proper drainage of the winter-rains from our young wheat plants is a work of the highest importance; and the different practices of the provinces afford much useful information as to how it can best be accomplished.

THE DRAINAGE OF THE WOOLWICH AND PLUMSTEAD MARSHES, THE RYE AND DERWENT VALLEY IN YORKSHIRE, AND MARTIN MERE IN LANCASHIRE.

The drainage of the Woolwich and Plumstead Marshes is now beginning to attract attention in a sanitary point of view. It ought to have been undertaken long ago, for its economical importance. It speaks little for the agricultural enterprise of the county of Kent, that so large a tract of fine alluvial land should be allowed to remain in probably the same condition as in the times of the Norman Conquest. The increase of “opulent, enlarged, and still increasing London,” is encroaching every year, more and more, on the belt of market gardens, which surrounds the metropolis; and every year, the cultivation of the vegetables required by its two millions of inhabitants is driven further into the country. In these marshes we have a large extent of fertile soil, favourably situated with respect to the London market and manure. On their drier portions the cultivation of garden crops is beginning to establish itself, and nothing is wanted but effective drainage to render this general. So little, however, has the drainage of this tract been hitherto considered worthy of attention, that, though these lands are below the tidal level, no attempt has been made to divert the upland waters, which might easily be discharged, even at high tide, above the embankment, by means of a raised drain, or fleet as it is called in Norfolk, or by some other better device of modern engineering.

In consequence of their position below the tidal level, these marshes can only be relieved of the water which falls on their own area, by means of steam-power drainage. The great obstacle to the success of such an undertaking will be the difficulty of inducing the many owners and occupiers interested in these lands to co-operate for an object which would be as profitable to themselves as it would be beneficial as a sanitary measure to

the neighbouring community, including no small portion of the population of London.

We therefore recommend to their attentive consideration two articles on district drainage, in the last number of the Journal of the Royal Agricultural Society. One of these is a report by Mr. Henderson, on the Drainage of the Rye and Derwent Valley in Yorkshire. In the other, Mr. White of Warrington, describes the drainage by steam power of a portion of Martin Mere in Lancashire.

It is observed, very justly, by Mr. Henderson, with respect to valley drainage, that, generally speaking, a river will preserve for itself a sufficient fall for the discharge of its waters, proportioned to the tenacity of the soil and the elevation of the basin of the valley above the high-tide level; but that, unfortunately, in a long settled and densely peopled country like ours, there are few rivers, or even minor streams, which retain their natural features, and have not been dammed up above their primitive levels, so as to interrupt or even entirely to destroy the drainage, either for the sake of obtaining water power for mills, or head water for inland navigation.

Such artificial obstructions caused the flooding of a large portion of the Vale of Pickering, which contains about 100,000 acres of valuable land unwatered by the united streams of the Rye and Derwent, and receiving the upland waters of a much more extensive catchment basin. The case is so different from that of the Plumstead Marshes that it is only brought under the notice of the proprietors of that tract as an example of the improvement which may be effected by judicious co-operation. The destructive effects of floods in that valley had long attracted attention, and some progress had been made since the year 1800, in draining the

lower part of it, by diverting a portion of the upland waters directly into the sea by means of a sluice and a new cut, and by means of another new cut which drained a portion of the valley, amounting to about twelve thousand acres. Several proposals had been made for draining the upper portion of the valley; but it was only in 1845 that sufficient unanimity could be obtained to enable an act to be carried, incorporating fifty-three parishes and townships for draining, and appointing seventy commissioners, who were chiefly landowners or their agents, with power to purchase and remove mills, mill-dams, locks, weirs, and shoals, and to assess the lands benefited in proportion to the benefit derived, in a sum not exceeding thirty thousand pounds. At this stage of the proceedings, there were three mills to be purchased, having an estimated available water power equal to that of 109½ horse's power. This water power was valued at £19,700; in addition to which there was mill property, exclusive of any tenant's interest therein, valued at £7,759 more, making in the whole £27,469.

Adding to this, compensation to the tenants, and the purchase of impediments arising from navigation locks, the gross sum required to carry the proposed improvement into effect would have absorbed an amount exceeding by £2,000 that which the commissioners were empowered by their act to expend. Under these circumstances, it became a question whether the commissioners should proceed any further with the scheme, or abandon it, with the loss of the expense of procuring the act, and of surveying and taking the levels of the valley. Lord Fitzwilliam, who owned three-fourths of the mill property, having met the difficulty in a most liberal spirit, it was resolved to negotiate on the basis of converting *actual water-power* into steam-power, and to compensate for the extra cost of maintaining the latter as compared with water-power. Of the 109½-horse power, available by means of water, it was found that only 70-horse power was actually used, and that with the drawback of the loss of several weeks' work from back water and occasionally from drought. The basis of the calculation now became the first cost of erecting the steam-engines required, and the expense of maintenance above that of the ordinary water-power employed. The total cost of establishing and maintaining the requisite amount of horse-power was found in this way to be £16,382 5s.; of which the cost of the engines was £3,500 at £50 per horse-power, and the annual expenses for coal, engine-man, and wear and tear of machinery £669 2s. 3d., amounting at 20 years' purchase to £13,382 5s. In the above calculation the consumption of coal was estimated at 10 lbs per horse-power per hour, working 12 hours daily for 311 days. Coal was valued at 7s. per ton; engineer's wages were charged at 21s. per week; and wear and tear of engine, tallow, hemp, and oil, taken at £1 per horse-power. For the mill property and compensation to the owners for loss and damage in the removal and rebuilding £3,367 was awarded, making the entire cost of the improvement £20,250.

There were claims for the removal of the locks of the Yeddingham Navigation, for the destruction of two fisheries, and for damages to the tenants of the mills for loss of time and derangement of business. The funds at the disposal of the commissioners being inadequate to this, Lord Fitzwilliam, the owner of the property, took the whole upon himself, simply to facilitate the operations of the commissioners, although he was not interested in the drainage to any considerable extent, in consequence of the greater part of his own estate having a complete system of drainage effected at his own cost, with an outfall below the mills which were removed.

The total expense of the improvement was, as we have said, £20,250, exclusive of salaries to the staff, expenses of the act, and of the survey. More might have been effected with a larger expenditure. For this sum, floods have not been wholly prevented; but the highest inundations now run off in two or three days, instead of the whole basin of the vale being converted, as heretofore, into a lake during a great part of the winter; and Mr. Henderson is convinced that one flood before these alterations effected greater damage to crops and tilth, if fairly valued in money, than the whole sum expended under the act.

The drainage of Sir Thomas Hesketh's property in Martin Mere, by steam-power, described by Mr. White, is of more interest to the owners and occupiers of Plumstead Marshes, because it is the kind of improvement adapted to their own case. Our limits will not permit us to go into details, but the following are the general results.

The capital expended in making catchwater drains to carry off the upland water, cutting water-courses to carry the drainage water to the engine, and putting up the engine, was £3,425. The annual expenses for coal, wages, wear and tear of engine, keeping up embankments, and interest on capital, is estimated at £452. For this sum, 1,000 acres were drained; but 300 of them were on more elevated ground, and are therefore considered not to have been increased much by the operation. The annual value of the remaining 800 acres, before being drained, was £529—after drainage £1278; leaving a net annual profit of £297, besides interest on the capital expended.

In this calculation, the coals consumed by the engine are valued at a little above 5s. per ton. In the case of the Plumstead Marshes, the coal would cost five times as much, and the present value of the land is much greater; but on the other hand, the improved value from its contiguity to markets, and from capability of being converted into garden ground, would be much more in proportion. Supposing only a quantity of land drained there, equal to that drained in Martin Mere, viz., 800 acres, the difference in the price of coal would increase the annual expense by about 5s. an acre; but the drainage of some thousands of acres could be effected at a cheaper rate than that of eight hundred.

THE CONSUMPTION OF THE TURNIP CROP.

The most profitable as well as most economical consumption of the turnip crop is a subject of paramount interest at this period of the year to all turnip growers; and as I recently expressed my opinion somewhat disparagingly of the usual practice of storing turnips, it is incumbent upon me to endeavour to point out a better course of management of the crop with respect to its *consumption*. I must, however, premise, that I fully approve of a very considerable proportion of the crop being led off all lands liable to flooding, or to become poached by the treading of sheep during the time of feeding off, or where the lands lie much exposed and the crop is greatly endangered by the severity of the climate, as it will be on all elevated situations or in cold countries; or, again, when the land is required for a succeeding crop; and, furthermore, where the occupier practises the fold-yard system of feeding, be they wanted for either cattle or sheep. For these and many other minor purposes the crop ought to be carried, and appropriated to his stock by the use of cutters and such other devices as the occupier can economically adopt to consume them in the most cleanly and profitable manner. For these latter uses, too, it is very desirable, if not indispensable, that a surplus supply should be always in hand. If they are well stored, and free from heat or fermentation, they are unquestionably improved by it, providing it does not extend over too great a space of time: a fortnight's stock is, perhaps, sufficient; but, unless under apprehension of a protracted frost, it should not much exceed that period.

I must also premise that none of the common varieties of turnips can with any degree of safety undergo storing beyond a few days, and then generally under great depreciation in quality. Common turnips must be consumed immediately after drawing, or loss ensues. Swedish turnips will be improved by careful storing for a short time; but if that is long extended, their quality likewise becomes degenerated. Both varieties suffer much from variable weather, alternate frosts and thaws; and the more nutritive and valuable the bulbs, the more liable are they to rot. When they have once been frozen, great caution should be used in storing: plenty of time should be given for the return of the juices of the bulb throughout the frozen or injured parts; and, as a rule, after a frost, I would urge that common turnips be used fresh from the field, and that the Swedes be left awhile to recover their nutritive quality.

The best and most profitable mode of consumption.

—This I think is unquestionably by sheep on the land upon which the crop is grown, and the mode by which the crop should be supplied to the sheep is by cutting and feeding off in troughs.

The most approved practice is as follows:—The sheep are confined in folds according to the wish or design of the occupier; generally the more delicate and weaker part of the flock take the first fold; the stronger or the fattening portion in the next fold; and these are followed by the ordinary store stock to gather the remains. Frequently they are divided according to sex; particularly, if the usual practice is to dispose of the male lambs in the spring. A man and his assistant lad will without difficulty draw, cut, and carry out to troughs a sufficiency for 250 to 300 sheep, providing the small ones are left to be eaten off the ground; or, if he is provided with a cart, and the turnips are ready graded, he will cut sufficient food for about 500 sheep with Gardner's turnip-cutter. Much, however, depends upon the cleanliness of the roots. The expense of cutting and carrying out to the sheep, taking this as a fair estimate, is then a mere trifle per head per day, which is amply repaid in the extra condition of the animals; indeed, it is asserted that the improved condition and enhanced weight of the fleece alone will pay the cost of cutting and feeding. The economy or saving in the crop is immense, as very little loss ensues if proper feeding troughs are used. The best I have seen are very simple in construction. The bottom is one $\frac{3}{4}$ -inch leaf of a 11-inch deal; the sides, a batten cut into four leaves nailed upright to the bottom, fastened or made up at the ends, with slat across the middle; they stand upon feet about 20 inches from the ground, projecting out to prevent turning over, and are set on about 4 feet from each end of a 20 feet trough. The sheep cannot conveniently get into them, nor throw out the slices, or turn them over; and young sheep are benefited, in appearance at least, by being compelled to hold themselves up while feeding.

The simple process of application is as follows: and so far as my experience has enabled me to decide upon by its adoption, I heartily approve it. Immediately prior to putting on the sheep, the larger portion of the turnips are drawn from the folds into convenient heaps, taking them just as they grow, with the tops on. The sheep are then put into the folds, in order as above, and supplied with cut turnips, as they are feeding off the small ones left on the field to be picked over and browsed at leisure: this mode prevents the injurious effects arising from taking too

much green or succulent food without being sufficiently mixed with the food derived from the bulbs. To correct both, and also to aid in the economy of turnip feeding, the sheep are supplied every morning with a small portion of cut oat chaff before their usual feeding of turnips: this small supply of chaff prevents scouring and flatulency; and the best time to give it is in the morning on the empty stomach. The turnips are cut up along with as much of the tops as possible, as the tops aid greatly in giving bone and muscle to the young sheep. This course is pursued throughout the field. The weaker sheep are supplied with such portions of the turnips as appear most conducive in promoting their welfare—the coarser and more succulent portions being withheld, and given to the stronger sheep. The fattening sheep, or those designed for first sale, are fed upon the general crop, and are with the first fold passed on from fold to fold without being compelled to eat up their folding too closely: this in fact being left to the third fold, or ordinary store stock: these are also supplied with a fair proportion of cut turnips, while they are made to consume all the spare tops and bitten or injured bulbs of the former folds. In this manner the feeding off the turnips proceeds, taking care before every fold is entered upon to draw the best of the crop, and lead them, as before stated, to convenient heaps for cutting.

When the common turnips are done, I proceed

in the same manner with the Swedish turnip, except that the Swedes are all topped and tailed and put into graves as described in my last paper "On the Preservation of the Swedish Turnip Crop." This greatly facilitates the cutting or shepherd's operations; and it is needed, because the quantity of tops being so much less, the greater quantity of bulbs is required. The cutting of swedes for young sheep seems indispensable. They are usually at this period (the early spring, which is the time this crop is commonly consumed,) changing their teeth, and cannot feed with pleasure upon the hard Swedish turnip; and even when the cutting is continued, they will frequently for a short time lose condition: on this account it is desirable to mix the two varieties in the cutter, and thus supply them, rather than make such a direct change at once. The sheep soon become accustomed to them; and then their satisfactory progress is such as to be daily observable. There is no crop equal in bulk and quality to the Swedish turnip, or so valuable as food for sheep in the spring, or upon which they will thrive so fast; and one of its best characteristics is its durability, because if properly stored in the spring, before taking a new shoot, it will retain its value to the last, and may thus be made almost invaluable in providing a supply of the most nutritive food against a cold and protracted season—the bulbs retaining their nutritive value till the summer is fully set in. P. F.

THE KEYTHORPE SYSTEM OF DRAINING.

In the admirable lecture which Mr. Baker of Writtle lately delivered before the London Farmers' Club, on the benefits which science has conferred on agriculture, he remarked that the discordant opinions which prevail respecting the proper depth, distance, and direction of drains, prove the want of some general principle, which geology may perhaps be able to supply.

The Keythorpe system of draining is founded on geological principles; for its distinctive feature is the complete and systematic examination of the soil, subsoil, and water level, which it undertakes in each field, before it commences operations. We expressed, a few weeks since, surprise that the account of this system and of its asserted cheapness and efficiency, which appeared in the last number of the *Journal of the Royal Agricultural Society*, had not drawn forth some comments from those professional drainers who are pledged to opposite and more expensive, but perhaps, after all, better methods.

Since then a controversy on this subject has

been raging, and it is only natural to expect that before long the tide of war may roll into our own territories. We therefore beg to inform our readers that we shall be happy to receive communications on the principles and practice of land drainage. All we require is, that in any discussions which may arise, the real questions at issue may not be lost sight of, and that personal altercations may not take the place of fair and temperate argument. The questions to be decided appear to be the following:—1st. Is or is not the Keythorpe estate effectively drained, and is it drained at from one-third to one-half the cost of draining in the prevalent mode, on soils equally retentive? 2ndly. If the land is not sufficiently drained, the cheapness of the system is only a delusion. 3rdly. Have the subterranean furrows, to which so much of the cheapness and efficacy of the Keythorpe drainage is ascribed, an actual existence, or are they only imaginary? 4thly. If they are real, are they confined to the neighbourhood of Keythorpe and to the lias formation, or are they of general occurrence? 5thly. Where

they occur, have they any definite direction, and what is it? 5thly. In those districts in which they are common, are there any situations and forms of surface which are free from them, and what are they? 6thly. Granting the existence of these subterranean channels, and supposing their direction to be that of the fall of the surface, is there or is there not anything at variance with the laws of gravitation and of hydraulics, in cutting drains obliquely across them, giving to those drains such a fall, that the water which has percolated the soil above them will flow freely along the channel provided for it, instead of filtering through the soil lying lower down the hill than the point at which the drain crosses it?

The eminent professional men who have been acting so extensively for many years as land drainers must be able to answer these questions. Whether they will deem it prudent to answer them is another matter. Perhaps they may prefer shrouding their proceedings in mystery, and may not wish to reveal the secrets of their craft to the uninitiated, or to give instructions which may enable farm bailiffs and land agents to drain land equally well with themselves. Perhaps they may prefer concealing the principles on which they drain, and calling on landowners to trust implicitly to their experience.

If this is so, we have no more to say. No man should be asked to reveal secrets on which his bread depends. Secrets, however, are rapidly disappearing from everything connected with agriculture. There was a time when an opinion prevailed among farmers, that they knew something about land, which it was advisable to conceal from their landlords. They know better now. Moreover, when we have heard such directions given as the following: Commence your drains parallel with whatever fence coincides with the fall of the surface, make them $4\frac{1}{2}$ feet deep, and 8 yards asunder, it has struck us that there can be no great mystery in the gridiron system of draining, and that it is a great waste of talent to call in a draining engineer and a government inspector to do that which any good ploughman could do as well.

After all, this important question remains for consideration: Granting the cheapness and efficiency of the Keythorpe system, is it practicable on a large scale, and for those landlords who are obliged to drain with borrowed capital? May not a more dashing and expensive kind of drainage answer their purpose better? The mode of draining pursued by Lord Berners may be all very well for a landowner who proceeds on the *festina lente* principle, setting apart a certain sum annually with which to drain a certain portion of his estate every year, and employing only the labourers of the

neighbourhood, under the superintendence of his own agents. If, however, a landlord is obliged from pecuniary considerations to have recourse to the aid of a draining company, the time of that company's officers is too valuable to be frittered away on such a preliminary probing of the internal structure of the soil, and such constant and minute inspection as the Keythorpe system requires. Moreover, when a company have made a contract for draining an estate, the work must be done out of hand. The interests of the landowner, no less than those of the company, require that they should send an army of drainers to complete the work as rapidly as possible. Till the drainage is finished, the capital of the company is locked up. It is only then that the rent-charge takes effect; it is only then that the tenants can be asked to pay a rent increased by the per-centage on the sum expended in draining. What if the Keythorpe system saves 20s., 30s., or even 50s. an acre in the cost of draining—what difference will that make in the annual rent-charge, and what matters its amount to the landlord, if he can induce the tenants to pay it? These are some of the arguments which we have heard advanced against any deviation from the present prevalent system of draining. We should be glad to learn what landlords and tenants think of them.

This article is already a string of questions; but there is one more which, in conclusion, we must put to the advocates for running the minor drains up and down the hill. What is their reason for doing this? The practice originated with the late Mr. Smith, of Deanston. The reason assigned for it by him was that the laminae of stratification follow the fall of the hill. It is not very clear whether he meant by this the stratification of the superficial deposits which usually extend to greater depths than even most of the deepest drains which have come into vogue since he wrote the above, or whether he alluded to the stratification of the still deeper rocks which occasionally come to the surface. The diagram which he gave, in illustration, favours the latter supposition; but it shows planes of stratification, dipping into the hill, that is in a direction directly the reverse of that described in the text.

The up and down system of drains has been adopted from Smith. The reasons which he assigned in favour of it appear untenable. Are there any sounder reasons which justify the present general adherence to the practice, and which render—

“His conduct still right, with his argument wrong”?

THE VENTILATION OF FARM BUILDINGS.

LECTURE

BY JAMES D. FERGUSON, ESQ., OF BYWELL, AGENT OF WENTWORTH B. BEAUMONT, ESQ., M.P.,

TO THE HEXHAM FARMERS' CLUB.

A numerous meeting of the Hexham Farmers' Club was held in the spacious room of the Mechanics' Institute of that town, on Tuesday, the 8th of November last, for the purpose of hearing a paper by James D. Ferguson, Esq., of Bywell, on "The Ventilation of Farm Buildings." John Grey, Esq., of Dilston, occupied the chair.

Mr. J. D. Ferguson, who was received with applause, read the following paper:—

"Mr. Chairman and Gentlemen,—When your respected secretary and other members of the club, some weeks ago, solicited me to address to you a few remarks on the subject of ventilation of farm buildings, I very much hesitated at the time whether I could comply with their request, complimentary though I considered it to be; because, as you are aware, my time generally is so fully occupied that I was afraid I should not be able to give the subject that attention and thought that its importance required. If what I am about to state, therefore, should in any respect appear uninteresting or unsatisfactory, the want of proper leisure to prepare and arrange the subject must plead my apology, and I therefore respectfully crave your indulgence. The proper ventilation of farm buildings is a subject which hitherto, I fear, has not much engaged the attention of architects; for, although we occasionally see around us, while travelling through the country, evidence of the enlarged views of landlords expending large sums of money in building handsome farm steadings, and thereby greatly enhancing the value of their estates, by encouraging the enterprise and skill of their tenantry, yet, so far as I have had experience, I have never observed any proper provision made in new buildings either for the admission of pure air to, or the escape of impure air from, houses where cattle are confined. I believe it will be generally admitted by all practical farmers, that it is a matter of serious importance, in order that farm stock may at all times be kept in a healthy and thriving state, that a proper mode of ventilation ought to be introduced in farm buildings, without which it is impossible, notwithstanding well-planned houses, and the greatest care on the part of farm servants, that either horses or other cattle can be kept free from disease. In the remarks which I shall make in respect to a proper system of ventilation of farm buildings, I shall endeavour to be explicit, in order that I may be well understood; and if I can by anything I shall say, with the help of this model of a ventilator before me, aid the enquiry of any gentleman present, by affording useful information on that important subject, I shall feel very great pleasure indeed. In the first place, I shall advert to the style of old buildings, and point out the method which, in my opinion, ought to be adopted to make these more healthy for cattle than at present I believe many of them are. In the second place, I shall endeavour to show in what manner new farm buildings are generally very defective in ventilation, as well as in the proper size and arrangement of the various houses for the confinement and management of cattle; and then point out how these, as well as new buildings which may in future be erected, may at very little expense be improved, so as to make them healthy abodes for cattle. In the third place, I shall point out where some progress has

already been made in introducing a cheap mode of ventilating farm buildings, as well as a proper system of keeping the stables and cow-houses, or feeding byres, always in a clean and healthy state, and then conclude my remarks by making some general observations on the subject, important and interesting as I would wish it to be to all practical agriculturists. In observing, therefore, Mr. Chairman and gentlemen, the rule laid down for myself, I may state, in respect to old buildings, what almost every one knows, that in former times scarcely any plan or data whatever appears to have been observed in planning a farm steading. Sheer but mistaken economy in the erection seemed to be the only point aimed at; for we have evidence in hundreds of places, and in all countries, of the various houses for cattle (evidently built at different periods) being not only badly planned and arranged, and in many respects too small in size, but no provision whatever made either for the access of pure air into the buildings, or the escape of impure air from them, except that which I believe arose from mere chance, and which generally happened to be bad workmanship in fitting the doors and windows, which allowed the free access of fresh air at all times into the buildings, while the vitiated air was allowed to escape through the thatched or tiled roof which, in former days, covered almost every building for farm stock; hence the reason why, in these houses, although often very cold, uncomfortable, and small, cattle (notwithstanding direct currents of cold air into these buildings, which, if possible, should always be avoided) were generally much more healthy than they are now, in close confined houses under air-tight slated roofs; and the reason of this is, they were not subjected to such sudden transitions from heats to colds, and *vice versa*, as in many places they now are, when turned out to the fields, after having been shut up in warm, badly ventilated houses. Such treatment is sure to engender disease. In old buildings, where the roofs are covered merely with grey sandstone slates, tiles, or thatch (and perhaps, gentlemen, some of you even at present may rent some houses such as these), I would venture to recommend that, except keeping the roofs water-tight, they should be allowed to remain as they are, rather than try to improve them, as there will be abundance of apertures or crevices through which the heated and impure air will escape; but in order that a good supply of fresh air, equally essential, may at all times be admitted in an undulating manner (for all direct currents should, as I stated before, be prevented), air holes or ventiducts should be made through the wall behind the cattle, at say every ten or twelve feet, on each side of the entrance or outside door. Into these openings, which may be made through the wall two feet above the floor (the reason of this I shall state by and bye), tubes of wood or iron should be inserted, four or five inches diameter, or they may be made square with a grating on the outside end, to prevent the ingress of rats or mice. The outside end of the tube should be made flush with the wall, when fixed in it, and its length should be five inches less than the wall's thickness, in order that a groove may be cut of that depth and width from its mouth downwards to within six inches of the floor. On this groove a thin flag or board of two inches in thickness should be fixed flush

with the wall inside, and the air is admitted indirectly into the building below the end or bottom of the flag, and about six inches from the floor, by an aperture which will be five inches wide and three deep. The same effect may be produced if tubes are dispensed with, if the job is done in a careless and slovenly manner; but I would recommend tubes as being certainly more tidy and workmanlike; but either plan is very simple and cheap. A more efficient method, however, in my opinion, of allowing the admission of fresh air into a building, and at the same time regulating the quantity, I shall by and bye have occasion to advert to, and point out how it may easily and cheaply be effected. You are aware that it is a very common method to admit fresh air into a building for farm stock by latticed windows; but as these allow direct currents of cold air at an improper place, the plan is certainly objectionable, at any rate for stables, which ought to be kept at a temperature of about 55° in winter, and from 60° to 65° in summer. Cow byres, however, should be kept much cooler, and therefore ought to have more air holes or ventiducts than stables, which would allow a temperature ranging from 55 to 60 degrees. It is important for the health of cattle that the dung in stables and byres should be removed every morning, and a little gypsum scattered over the channel or gutter, which is a good deodorizer or disinfectant; or, what is much better, be completely flushed out with water, and then conveyed either in an open channel or in socketed pipes to a tank, which ought to be situated in every steading, whether old or new. This prevents any injurious effects from the ammonia or emanations arising from the urine, which, in close confined stables tends greatly to destroy the eyesight, as well as the health of horses, and moreover its escape is a very great loss to tenants; but the proper mode of cleansing and purifying stables and cow-houses, &c., I shall more fully detail in the next section of my subject, when I come to treat of the best system, in my opinion, of ventilating new farm buildings. In regard to recently-built steadings (which is the second head of my subject), the following arguments will apply to them, as well as to buildings which may in future be erected; and, in respect to buildings already in existence, I may state that, although many plans have been introduced to admit fresh air into a building for cattle, as well as the escape of impure air from it, such as holes made in the walls at various heights and distances apart, sometimes before and sometimes behind the cattle, and in some lately-built steadings which I have seen, the ventilator or escape vent is made on the side of the roof, and even it is not uncommon that skylights are made to open, to serve as ventilators as well as for the admission of light, all these methods in my opinion are bad, for this simple reason: these openings are made in the wrong place, and moreover no control can conveniently be used to regulate the power of these ventiducts, unless it is the very clumsy and often exceedingly inconvenient method sometimes adopted by servants, of putting a wisp of straw into them in cold weather for the purpose of raising the temperature in the building, or in other words, retaining the heated air which has been deteriorated or made useless by frequent respiration. Now, gentlemen, the model of a ventilator before me, the working of which I shall explain to you by and bye, is a simple, cheap, and efficient contrivance, which in my opinion is well calculated to allow the escape of vitiated air from a cow-house or stable, if set where it ought to be on the apex or highest part of the roof, by the simple process of pulling a cord. This contrivance might also be applied with good effect for the ventilation of churches and school houses, for in these buildings the absence of a proper and simple mode of getting quit of the foul air is sometimes not only very seriously felt, but is at all times most injurious to

health, especially when these houses are in a crowded state. When I practised in Glasgow some years ago as an agricultural engineer, I was sometimes consulted in respect to the proper arrangement of farm buildings, as well as other agricultural improvements, and in travelling through the country I very often found extreme deficiency in the ventilation of farm buildings. I therefore saw at once the necessity of advising the introduction of some cheap but efficient contrivance to admit fresh air, which would enter where it only ought to find admission, viz., at the bottom of a building, while at the same time the vitiated or impure air was allowed to escape at the top. This led me, after some consideration, to cut out a model of the ventilator which you see before me, in pasteboard; and after having got it sewed together, I took it to a cabinet-maker and got two made, one of which I sent to the Agricultural Museum in Edinburgh, and the other I kept. Now, gentlemen, before I describe the working of this ventilator, which is a very simple operation, allow me for a little to offer you my opinion in respect to the proper size or dimension of houses for the feeding of farm stock, and the method by which they may be cheaply and efficiently ventilated. But I may state here, in passing, that I believe the time is not far distant when we shall see excellent and cheap farm steadings all under one roof, railway stations being good data from which a design might be obtained. According, however, to the present mode of building steadings, a feeding byre or cowhouse for one row of cattle when tied up, should not be less in width than 18 feet within the falls, including a passage at their heads for feeding 3½ feet wide. The side walls should not be less than ten feet in height above the floor, and ought to be made smooth with one coat of good plaster, and once at least each year should be carefully washed with hot lime, which makes the atmosphere in the building sweet and healthy for the cattle confined in it. A stable ought to be in every respect (except a passage at the heads of the horses, which is unusual) of the same size, and above neither cowhouse nor stable ought there to be, on any account, any loft or ceiling whatever, but open entirely to the roof, which should be slated on sarking boards, and of the usual pitch. The walls, of course, of the stable ought also to have one coat of plaster, and be carefully lime-washed at least once, if not twice each year. Now, in order that such houses may be properly ventilated, that stock may be kept in them in a perfectly healthy state, ventilators similar to the model before me, which may be made three feet long by two feet wide, should be placed on the apex or highest part of the roof, for this reason, that impure or vitiated air in the building, being heated and consequently lighter than cold air, always rises upwards and vertically, (provided fresh air in sufficient quantity is admitted below,) and flies off by any aperture in a line above it, which may facilitate its escape, and therefore out of reach of respiration. This is a beautiful law of nature, for had it been the reverse, that the specific gravity of foul and heated air was heavier than cold air, as some erroneously suppose, then it would have been continually floating on the surface or sinking into it, and consequently neither the animal nor vegetable creation could have existed for a day. This theory may be proved by any gentleman present riding his horse pretty sharply for a mile on a frosty morning. He will observe the vitiated air, which has passed through the lungs of his horse, expelled from his nostrils at every pulsation, and in place of its being heavy and falling to the ground, rise upwards and escape beyond reach of being breathed again. This is a proof that cold or fresh air should always be made to enter indirectly at the bottom of a building, for where air holes or openings are made for ventilation four or five feet from the floor, as I have sometimes seen them, they are of little or no use whatever, for

they neither allow cold air to get into the building at the proper place, or in a proper manner, nor heated air out of it; for, as I said before, it rises directly upwards, and, if there is a ceiling, spreads along it horizontally, being unable to escape, and consequently condenses or distils on the cold surface, dropping down on the cattle below. This probably may have been noticed by some of you again and again. Now, when we afford means for the escape of the foul air at the proper place in a stable or cow byre, we must not lose sight of the absolute necessity of obtaining fresh supplies of pure air, which should always be admitted into a building at a low level, for the very purpose of lifting or pressing upwards the impure air, which will not ascend otherwise, for exactly in proportion as the cold air is admitted below, will the vitiated air which has been rendered useless by frequent respiration, be expelled or forced upwards, and it therefore follows that an opening in the highest part of the roof should be made to allow its egress, and that opening should be formed in such a manner that direct currents of cold air may not obstruct its upward tendency. (Mr. Ferguson here explained his method of ventilation with the aid of a very neat and ingenious model which was placed on the table before him, showing that, by simply pulling a cord, the valves of the ventilators at the top of the building, which are fixed in a wooden box projecting above the ridge of the roof, are raised for the emission of the impure air, while, at the same time and by the same cord, the fresh air is admitted by means of air drains and chambers placed at intervals at the bottom of the building, and communicating with each other and with the external atmosphere, so as to introduce the vital element in a diffused and undulating manner). Now, gentlemen, if you will have the goodness to look at this model, you will observe that provision is made for the admission of fresh air in an undulating manner, which, if possible, as I said before, should always take place, into a building, as well as allowing foul air to escape from it, by the very simple process of pulling a cord. In every well arranged stable or feeding byre, there ought to be air chambers, (the number of course will depend on the size of these horses,) which may be made about 20 or 22 inches deep, by 14 or 16 inches square, with iron gratings over the top of them. These should be made on the outside as well as the inside of the building, either in the passage of a feeding byre, or behind the cattle on each side of the entrance or outside door, about 14 or 16 feet apart, and about 10 or 12 inches from the side of the wall, similar to the model before me. These chambers should communicate with each other at the bottom by air drains in a line with the ventilator on the roof, by a wooden box, or square building of bricks may do, made through the wall of the building, which may be the same size as the air drains, 10 or 12 inches deep, by eight or nine wide. You will observe by this model, that there is a damper which works in a groove in this box or drain, flush with the inside of the wall, and, on the upper edge of it, a cord is attached which passes over a pulley fixed to the wall plate of the building, and hangs down the wall. The cord which opens the valves of the ventilator on the ridge of the building, you will observe, is made to pass over a pulley fixed to one of the spar legs of the roof, and also down to the wall plate over a second pulley, and then tied to the cord of the damper below. This cord then, forming one only, hangs down the wall like a bell rope, and you see, by giving it a gentle pull, you raise the damper for the admission of fresh air below, while at the same time, and by the same simple process, the valves of the ventilator at the top are opened to allow the vitiated air to escape. The temperature of the building is therefore regulated by the distance you pull the cord; for you observe, when I put the loop of cord on the upper peg fixed to the wall, the damper below, as well as the valves of the venti-

lator above, are only half raised, which may be necessary in cold weather, while in warm weather, if I put the loop of the cord on the lower peg, you see that the damper is fully raised, which allows a rush of fresh air to get in below, while at the same time the valves of the ventilator at the top are fully opened, to allow the impure air to escape. This in my opinion will afford perfect ventilation to any building for cattle, as the whole apparatus is so perfectly efficient, simple, and cheap, (one ventilator with its damper and gratings not costing more than from 20s. to 30s. according to size,) that the most simple and unintelligent boy may so manage them that any stable or cow house, with the aid of one or more thermometers, which ought always to be hung up on the wall, may be kept at a proper temperature summer and winter, according to the number of horses or other cattle confined in the building. I must not omit, however, to notice, that if the dung and urine of the cattle are not carefully removed every morning, and the channels behind them well flushed out with water, as before observed, in vain may the farmer look for healthy stock, however suitable his houses may be; for, depend upon it, ventilation will not cure disease, although it will go a long way to prevent it, if assisted by order and cleanliness on the part of careful servants. And here I may observe that, at all times, servants ought to be allowed by their masters proper time for this part of their duty, for assuredly no part of their employment will in the end remunerate the farmer better than when their stock is carefully and faithfully attended to. In respect to cattle boxes, where perhaps two cattle are loose and fed together, the dung there, if the cattle are littered every day, may, without fear of doing injury by any offensive emanations, be allowed to lie for a month or six weeks, because, as the dung is firmly trodden down by the cattle getting loose, the ammonia cannot escape, and hence no injury can arise. When the dung is removed, a little gypsum thrown over the floor (if water cannot be had) will completely absorb the ammonia and moisture, and the atmosphere again become healthy. I now come to the third part of my subject, which is to point out where some progress has already been made in introducing a cheap mode of ventilating farm buildings, as well as a proper system, in my opinion, of keeping stables and cow-houses always in a clean and healthy state. This, gentlemen, may be seen in some of the farm buildings belonging to Wentworth Blackett Beaumont, Esq., M.P., on his estate of Bywell; and if any of you have a wish to visit these steadings, for the purpose of examining the method of ventilation and other improvements introduced there, some of which I believe are entirely new, I shall have much pleasure indeed in showing them. I suppose the most of you may have seen, or, at all events, may have heard, of the large and well-arranged steading of Nafferton, which in some respects is certainly one of the most extensive and best to be seen in any country. It measures 509 feet from east to west, and from north to south 261 feet, and that exclusive of the corn barn, which projects sixty feet north from the line of the square. The expense of this steading, I am informed, including the stack yard and garden walls, was nearly £7,000. Yet, notwithstanding that immense sum, and the good arrangement generally of the various houses, no attention whatever seems to have been observed in affording sufficient ventilation or light to either stables or feeding byres; and the consequence has been, that the respected tenant of that farm has from time to time suffered much loss in his horses, which I believe has been occasioned very much by the absence of sufficient access for obtaining good supplies of fresh air to his stables, as well as proper apertures for the escape of the vitiated air from them; and, moreover, I have no doubt, occasioned partly also by the negligence of the farm servants in not carefully removing the

dung and urine every morning. The stables are only sixteen feet wide inside, and the side walls a little more than nine feet in height, and they contain stalls for twelve pairs of horses; and although there are no lofts or ceilings in the stables or cow-houses, yet the roofs, which are air-tight slated ones, have no proper escape vents. When cattle were confined in these houses (they are now somewhat improved as to ventilation), and the doors shut, it was scarcely possible in warm weather to breathe; and the consequence was, that the heated air, not being able to escape, condensed on the lime with which the slates are rendered, and caused it again and again to fall off. Notwithstanding all this, the tenant, about a year ago, believing that the heat from the slates was the cause of injury to his horses, applied to have a ceiling put above them in the stable. This assuredly would have added to the evil, as proper ventilation would then have been much more difficult, as ventilators must have been taken through the ceiling, which would have incurred considerable expense without affording a proper remedy. We have therefore put (in lieu of a ceiling) a few ventilators on the ridge or apex of the roof of the stables, to facilitate the escape of the heated air, and have made proper air-holes or openings along the bottom of the wall six inches above the floor, for the admission at all times of a good supply of fresh air below by means of iron tubes with gratings on the outside, exactly in the same manner as I have pointed out and recommended in the beginning of this paper. Water being conveyed to that excellent steading by pipes, enabled me to introduce it into the stables, which before had never been thought of. A spigot or tap is fixed on the end of a lead pipe and inserted in the wall, about three feet in height, at each end of the building, in a line with the channel behind the horses, and a grated chamber in the middle, from the bottom of which a four-inch socketed pipe is laid to the tank in the steading. The gutter or channel is flushed out once or twice every day after the dung is removed, by opening these spigots, and the atmosphere in the stables in this way is rendered sweet and wholesome, while at the same time the contents of the tank are considerably increased. We have therefore reason to believe that, if anything like proper care on the part of the farm servants is observed, the horses and other cattle ought to be in a much more healthy and thriving state than hitherto. The new farm steading of Shilford (belonging to the same young gentleman, Mr. Beaumont), designed by myself, and now all but finished, is another instance where these improvements may be seen carried out in some respects on a somewhat better scale than at Nafferton. The steading is, however, comparatively a small one, to accommodate the farm, which is not large; and, therefore, the dimensions of some of the houses are less than I would have considered myself justified in recommending, if the farm had been extensive, for it is well known that it is much more expensive to build a good steading for a small farm, in proportion to the rent, than for a large one. The stables and cow-houses, the walls of which are plastered with lime, are, therefore, only sixteen feet wide inside, the same as at Nafferton, and the side-walls nine feet, or a little more, in height; whereas, had the farm been of large extent, the width of these houses would have been, as I stated before, eighteen feet at least, and the side-walls ten feet in height. A good supply of water is brought from a high elevation in iron pipes; and the channel in the stables and cow-houses are flushed out every day into grated chambers in the middle, behind the cattle, and conveyed in socketed pipes to a circular tank within the steading, in which there is a force-pump. This pump is wrought by a power from the steam engine, and the tank is emptied, while thrashing, into others at a considerable elevation, and these, again, are after-

wards emptied from time to time, by gravitation, to irrigate a few acres of grass lands in the neighbourhood of the steading. In the fouldyards, riding-horse stable, calf-house, boiling-house, &c., water is also supplied for the purpose of cleansing these houses, and increasing the contents of the tanks; and, with good ventilation and light, of which we have taken care to afford a large supply, we feel confident that, if the farm servants are careful in their management, the cattle cannot but be always in a sound and healthy state—at least so far as good farm buildings are concerned. The houses are all ventilated in the manner represented by this model; but the cow-houses have the appendage of two air-chambers and dampers, each damper being made to work flush with the inside of the wall, which, being exactly similar to this model, allows the ingress of a portion of fresh air below, while the impure and vitiated air escapes above, and this by the simple operation of pulling a cord, which any girl can do, and thereby, by having the help of a thermometer, before observed hanging on the wall, can at any time regulate the temperature of a stable and cow-byre. The whole, however, will be better understood—and, I hope, appreciated—if seen; and it will afford me much pleasure to show these farm buildings to any gentleman who takes a pleasure in seeing substantial and convenient steadings, and who will do me the favour to come down and look at them. I am sure it would gratify Mr. Beaumont to know that you take an interest in anything new in farm buildings; and I think I can speak for the respected tenants of these farms affording us every facility in looking through the various houses, the excellent stock in them being also well worth going many miles to see. I should like, therefore, that twenty or thirty of us would, on an early day, surprise them with a visit. Now, gentlemen, allow me to conclude my remarks by making one or two observations on the value and importance of ventilation of houses generally. There cannot be a greater mistake than to suppose that either human beings or the brute creation can long enjoy good health, if shut up in close, confined houses; and yet how often do we see, even in human dwellings, the greatest care taken to exclude the free circulation of the pure air with which a kind Providence provides us, and that without money and without price! Next to order and cleanliness in respect to all filth and offensive matter, which ought to be carefully removed from dwellings to a distance every day, the free circulation of air, by throwing open all doors and windows for an hour or two every good day, ought to be carefully and scrupulously attended to by every family occupying a house, however humble, or wherever situated. Some time ago, I was greatly astonished to hear of the opposition by some gentlemen in this town to the "Health of Towns Act" being applied. Doubtless, the expense which will necessarily be incurred in carrying out that important improvement was, in some respects, a reason for such opposition; but, when compared with the blessings which it will confer on every inhabitant, were it nothing else than in procuring (which can be done very easily and cheaply by gravitation) a good supply of pure and wholesome water for domestic purposes, as well as for occasionally flushing out the abominable and filthy lanes and drains in the town, opposition to that sanitary measure ought not, by intelligent men, having the interest of the town sincerely at heart, for a moment to have been thought of. Gentlemen, I know few places which might be made more healthy or more pleasant, in which to reside, than the town of Hexham, provided there were at command at all times, for the sake of cleanliness, a good supply of pure water, without which, depend upon it, drains and pipes in any town, however well contrived, do no good whatever, but much evil, unless constantly flushed out. Without

a copious supply of water, they soon get silted up with all kinds of refuse and decomposing matter, and the offensive gases which constantly emanate from them at every opening are most poisonous and suffocating. The dreadful pestilence which has lately visited this place, and which may continue to linger for some time before it takes its final departure (unless the utmost vigilance is observed), invariably first finds its victims in towns, where the people live in close, neglected, and confined places, in the midst of filth and nastiness; and when once the atmosphere gets poisoned and contaminated by the fetid odour, the better localities are of course very soon infected; and often many valuable lives, in consequence, are carried off. This is a proof that all good sanitary measures should not only be encouraged, but effectually carried out without the loss of a day; for futile and vain would the ventilation of houses be, however systematically carried out, if, by the sheer negligence and slothful habits of people, the noxious and poisonous effluvia arising from abominable streets, lanes, and privies, is allowed to be blown about, contaminating the atmosphere, baffling the skill of the best physicians, and carrying destruction and death to hundreds and thousands within its influence. The very same arguments apply to the brute creation; for however perfect the ventilation of farm buildings may be, if the dung and urine of the cattle in stables and cow-houses are not carefully removed at least once every day, and the channels behind them carefully flushed with water, it will be foolish and absurd to expect that such farm stock can long be kept in a sound and healthy state. In respect to ventilation, this is no theoretical notion; for I shall give you an illustration of the fact. Some years ago, I had occasion to look into a gentleman's stable where two or three pairs of carriage horses were kept. The coachman, with whom I entered into conversation, mentioned to me that he could not get his horses into condition, as they would not eat their food, and that when he opened the stable door in the morning, he often found them in a state of perspiration, and seemingly as exhausted and sluggish when he took them out for exercise, as if they had come off a long journey. The stable in which they were confined was ceiled above, and about 8 ft. 6 in. in height, but had no ventiducts through which the impure air could find egress, except a small opening in a pane of glass in each of two windows, which lighted the stable behind. I mentioned that the stable was not properly ventilated, and that there ought to have been no ceiling whatever above the horses, as the vitiated air could not escape; and I recommended that as sleeping apartments were above the stable, and consequently ventiducts could not be made through the ceiling for carrying off the heated air, holes or openings should be made through the side wall, just under the ceiling, opposite the head of each horse, and a wooden box inserted in each opening, 6 in. by 8 in. square. On the outer end of that box I advised that a piece of perforated zinc should be fixed, to prevent the access of birds or mice, and on the inside, flush with the wall, a sliding board, that he (the coachman) might open and shut at pleasure; and by this means, if tubes were inserted through the wall a little above the floor, in the manner I have pointed out that fresh air could be admitted, I thought, with the addition of the opening in the windows, he might, notwithstanding the ceiling above, create a circulation of air, and thereby ventilate his stable, which is a small one; and, providing he was careful to remove the dung and urine once or twice every day, I thought he might find no difficulty in keeping his horses always in a sound and healthy state. Some months afterwards I happened by chance to meet the same man, and he told me he had carried out my recommendation exactly as to the ventilation of his stable, and that he

found the greatest possible difference in his horses. They were then taking their food, and getting into high condition; and when he took them out for exercise they were as playful and in as high spirits as he could wish. It is the very same with human beings; for if people live in the midst of filth, in houses low, damp, and over-crowded, and the fresh and pure air prevented from blowing the noxious and poisonous emanations from their dwellings, in vain may they long expect to avert the ravages of fever and other pestilential diseases. For example, if a man and his wife, occupying a small dwelling, sleep in a bedroom with the doors and windows closely shut, and where there is no fire-place, the room probably only ten or eleven feet square, and the ceiling say only seven or eight feet in height (and unfortunately, gentlemen, there are hundreds and thousands of family bedrooms no larger, if indeed so large as this), they will in the morning rise the very reverse of being refreshed by sleep. Without doubt they will feel themselves, as hundreds have done before, almost as much exhausted as if each had been toiling for hours at some laborious employment, by having breathed over and over again the impure atmosphere confined in the room. If, however, the outside as well as the inside of the dwelling is kept clean and tidy (*and this of itself is of the deepest importance for the comfort and health of every family*), and a little fresh air allowed to get into the sleeping apartment, for instance behind the skirting board, or by any other simple means at a low level, and a small piece of the upper sash of the window kept open, which ought to be observed in good weather, summer and winter, in small family bedrooms, that a gentle movement of air may take place—then these people sleeping in such small apartments will assuredly find their sleep not only sound but refreshing, and the whole system invigorated by this simple and easy mode of ventilation, which by many I have reason to know is never even thought of. It is stated by an eminent engineer, Mr. Tredgold, that four cubic feet of fresh air is necessary every minute for an adult. If this be the fact, we may easily conceive how injurious to the constitution it must be for people to sleep in such small bedrooms as I have described, closely shut up; for, supposing no supplies of fresh air to get into the apartment at night, these two people would at that rate consume or breathe in two hours all the pure air that would be confined in the room, and during the remainder of the night they would be breathing, over and over again, air already much deteriorated by the evolution of carbonic acid gas from the lungs, and therefore most deleterious to the constitution. I now conclude, gentlemen, by expressing my regret that I have been obliged occasionally in my observations to digress from the subject, which was—the proper mode of ventilating farm-buildings; but it occurred to me that I could not, even at the risk of repetition, otherwise well illustrate my remarks without in some measure entering into these details, which I fear may have been somewhat irksome and tedious to listen to. I now beg to offer you my best thanks for the kind and attentive hearing you have given me while endeavouring to elucidate this important subject, and if any further explanation is required by any gentleman present, it will afford me much pleasure to give it. The lecturer concluded his paper, which had been listened to with the greatest interest, and resumed his seat amidst much applause.

The CHAIRMAN said: There is no one who has been attentive to the subject with which Mr. Ferguson is so conversant, but will be ready to confirm a great many of his remarks respecting the very close and confined air of houses. I understand, in some instances, the only access for air getting into farm-buildings is through the chinks of the doors, which, at night, are closed upon the inmates. Nay, even that very

simple mode of access for air is sometimes entirely shut out by dung and straw being stuffed into close the crevices, and so exclude the air from the stock, and making the house as unwholesome for the inmates as possible. I recollect, on one occasion, my attention being called to a farm where there was a great deal of disease amongst the horses; in fact, one horse died, and others were ill, but in this very stable every possible pains were taken to exclude the air these poor animals were dying for want of. (Hear, hear.) This is a state of things which ought to be remedied.

Mr. DOBSON said: Mr. Ferguson's plans are so simple that it is in the power of almost every farmer to adopt them at a moderate cost. The under ventilation, I think, is perfect. (Applause.) It is a subject which I have been connected with for forty or fifty years. There is nothing which I, as an architect, have found so difficult as ventilation; and to ensure ventilation the first and most important difficulty is the prevention of draughts; because draughts, as we all know, are sometimes very injurious to the constitution, and many a one has lost his life by them. There was Major Anderson, of Newcastle, in a public meeting at Newcastle, sat with his back to an open window, and never recovered; and I don't see why animals may not feel as we do. We sometimes see animals stand with their backs to a stone wall, but they rather prefer a hedge through which the draught is diffused and subdued. With respect to the ventilation of farm-buildings, I consider that model (pointing to Mr. Ferguson's model on the table) the most simple and perfect thing I have seen in practice. (Applause.) Now, though not an agriculturist, but knowing something of ventilation, I will call your attention to the subject of light. I think it is almost impossible to sit in an ill-lighted room without feeling some degree of unhappiness. Now, animals are similarly affected. It is necessary to keep animals happy, if you can; and nothing contributes more to that than plenty of light; and since glass is so easily obtained, there is no reason why animals should not be supplied with plenty of light. I agree with Mr. Ferguson about ventilation; but I would also impress upon you the necessity of light. I don't profess to be an agriculturist; but I have been employed for a good number of years now in the erection of farm-buildings. There are many farm-buildings built by architects which are exceedingly ill ventilated; but we must appeal to the farmer for information; if I had to build farm-buildings I should go to Mr. Ferguson, or some other agriculturist, for information; and I merely introduce the subject of light that some person may give us some information upon the subject.

Mr. LEE intimated that there was a prevalent opinion that light was no advantage, and that the less there was of it the better; but Mr. Dobson and the chairman gave expression to a decidedly different opinion.

The CHAIRMAN: Mr. Ferguson, in the course of his able essay, hinted at the idea—not a new one—of having the offices on the farm altogether under one roof, not having a roof over every cowhouse and separate place, but to have the whole under one roof in the same way as you see the roof over a railway station. If that could be done at a moderate cost, it would save all other roofing whatever, and you would have no need of ventilation, because if you had a glass roof, it would be open and effect the purpose. Now, if you could produce a plan to effect the roofing of offices in that way, you would deserve the credit, praise, and thanks of all agriculturists, because nothing would conduce so much to the health of animals, and the security of property, as to have something with a free access of air at all points. Mr. Ferguson mentioned another thing which I was glad to hear, because it is what I have acted upon ever

since I had anything to do with farm building in this country; but it was so much against the feelings of the farmers that it was a difficult thing to get them to do away with it—that is, to do away with hay lofts above their stables, which keeps together and returns the vitiated air upon the horses in a very unhealthy way; besides, if hay is kept there long it becomes very much deteriorated in quality, for bad air is continually accumulated there. If, instead of having the hay loft overhead, there was a certain place in the stable or some place adjoining it for the hay, it would be a very great advantage indeed. But there is not one farmer in ten would be a convert to that. There is another thing very desirable, and which would be inexpensive, that is, that there should not only be water to wash out the dung and stalls of the horses, to make them sweet and clean, but that the horses should have access to water circulating round their mangers, with a place they could drink at. A great deal of injury is done to horses by keeping them a long time from water, and then allowing them the free use of it. We cannot regulate the water a person will drink. Sometimes, when heated, or after much walking, I will drink a good deal—other days I will drink none at all. The same with animals. If they can have water of their own taking, they will take it when it is required, and in less quantities, and it will do them more good than if they are brought to the water at certain times, when they take more than they would do if they were always to take it when they like, and more perhaps than is good for them. The fact is, if horses had access to water at all times, they would never take a quantity to injure them.

Mr. TROTTER, of Healey Mill, combatted the notion that the vitiated air from animals had a tendency to rise; he had always believed the contrary, and thought that such air, being composed principally of carbonic acid gas, would be considerably heavier than the surrounding atmosphere, and consequently fall.

The CHAIRMAN, Dr. NICHOLSON, and Mr. DOBSON pointed out that Mr. Trotter had overlooked the fact that the rarefaction of the air caused it to ascend, and that then the object should be to carry it off, and supply its place with pure air admitted from the bottom, rather than allow the vitiated air to accumulate above, and then, by its specific gravity, to descend and be breathed over again by the animals.

The Rev. J. JACQUES: With the permission of the chairman, I will relate an anecdote which I think will help to illustrate the subject we are now discussing. The circumstance is this: A gentleman of property had a fancy to keep a number of monkeys, and, with a view to this object, had a large room constructed under his directions, something like a gentleman's drawing-room, for their reception. In this apartment was placed a kind of framework of wood, reaching a considerable height, for the accommodation of these animals, and suited to their well-known habits of climbing. When all was ready, 60 monkeys were placed in this habitation, and regularly supplied with suitable food. All went on well for a time. But a month had not passed before it was observed that most of these creatures became sickly, lost their vivacity, and discontinued their tricks. This was remarked to be particularly the case with those which had at first appeared the strongest, the most lively, and the most masterful, and which always selected for themselves the highest parts of the framework. In short, within six weeks from the time of their admission into this abode, 50 out of the 60 of these creatures died; those being the first victims which were originally the strongest, and accustomed, as I have said, to take the loftiest places. Of course, on investigation, it was ascertained that the cause of this disastrous result was the want of proper ventilation—that the monkeys died, in fact, from the effects of a poisoned at-

mosphere. Accordingly the survivors, which were found in a very sickly state, were removed to another apartment duly constructed with reference to this point; and the story goes on to say that these quickly recovered their health, and returned with their natural agility to their former habits. In the same paper is mentioned another striking circumstance in further illustration of this subject; but I do not exactly remember whether this was related as an actual experiment, or only mentioned as a result sure to happen under the conditions described. I will take the latter supposition. It is stated then, and no doubt correctly, that if a person on retiring to rest should draw the curtains of his bed closely around him, and at the top of the bed, within those curtains, should suspend a cage with one or two canaries in it, he would find the poor birds dead in the morning—the victims, of course, of the poisonous gas from his own lungs. The rev. gentleman concluded by observing that he had himself noticed the rising of carbonic acid gas in extensive breweries, though he admitted that this rising upwards was always in proportion to the quantity of heat evolved in the process of fermentation.

The CHAIRMAN: There is a continual evolution of gas in the air, and the practical illustrations afforded by Mr. Jaques to prove the ascent of the vitiated air are certainly very striking ones. The very same thing occurred to me about the injurious effects of people sleeping in beds enclosed by curtains. It is

very certain that if two people sleep in the same room, without any aperture or fireplace to allow the impure air to escape, the effect will be that they will rise unrefreshed, and have a headache in the morning. I would go a little further than Mr. Ferguson. I would not only condemn all small rooms, but all bed-hangings; because I am quite certain if two people enclose themselves within bed-curtains, in the course of the night the air will be so much vitiated that it will become extremely detrimental to them; and the experiment mentioned by Mr. Jaques, of the destruction of the bird hung up in a cage over a bed, proves how deleterious the air becomes within the enclosed curtains of a bed in a confined room in which two persons are sleeping. This shows two things—that the air is soon used up without the introduction of fresh air; and it shows also (what Mr. Trotter contests) that bad air rises up, because, if it does not, why should it kill the canary? It was found hovering round the top of the bed.

The thanks of the meeting were then passed to Mr. Ferguson, amidst loud applause, for his able and instructive paper.

Mr. FERGUSON begged to offer his best thanks to the chairman and gentlemen for the compliment they had paid him, and again urged the members of the club to visit the farm steadings he had named, and judge of the improvements themselves.

The proceedings terminated with the usual vote of thanks to the chairman.

ON THE USES OF GORSE.

On Saturday, the 6th of Nov., the members of the Newcastle Club met in their room, at the Literary and Philosophical Society of this town, G. H. Ramsay, Esq., presiding, when the following subject was brought forward by Nicholas Burnett, Esq.—“On the uses of Gorse.”

Mr. BURNETT, in opening the subject, observed that it had often been to him a matter of great surprise that a plant like the gorse, which was one of the most useful, should be so neglected by agriculturists generally. About 40 years ago, he was led to ride from Black Hedley to Mr. Thomas White, of Woodlands, who, he was informed, used gorse for food for his stock; and soon after, on a visit to that gentleman, he saw the whole process of cutting and grinding whins to prepare them for food for the cattle, &c. Mr. White also detailed to him the advantages to be obtained from the use of this plant; but, notwithstanding, he left Woodlands under the same impression as most of his neighbours, that Mr. W. was an enthusiast; and, for a long time afterwards, he (Mr. B.) thought no more about the matter. Some years elapsed, when his attention was again drawn to the subject by reading an excellent article on the crushing and value of whins, in “British Agriculture,” Vol. I, and he was induced to make some experiments. He first requested the servant to cut him a quantity of last year's shoots, and put them in the thrashing machine; but in this he was not successful. He next tried them through a powerful straw cutter, but he found the process so slow that it would not do; and then afterwards, he attempted to boil them, but he found that the thorny part was so strong as to make them uneatable. After these failures, he still persevered, and, as an experiment, he sent two sacksful to Newcastle, to a friend who had a pair of edge stones; but the motion was so slow that he abandoned this method also. In the year 1847 he found another article on gorse in “British Agriculture;” and after carefully perusing the article, he took one of his men, with a pair of garden shears, into the lanes on

the highway, and set him to cut some of the last year's shoots. From the time the man was employed, he (Mr. B.) found that if he could get the plant manufactured as he wanted it, the expense would be trifling; and having a bone-mill on his premises, which was worked by a small steam engine, he procured two horizontal fluted rollers, and introduced them into the mill; but, after working a short time, the rollers were clogged up. He then sent the rollers to Newcastle, and had them fluted perpendicular to the axis instead of horizontally; and he also contrived to make one roller revolve twice as quick as the other. On trying this experiment he found that it answered remarkably well, and the following is the result of his labours:—In the first year, viz., 1847, he used 8 tons, which were given to the horses and cows for food. In 1848 he increased the quantity to 21 tons, and fed the sheep with it, in addition to the horses and cows. In 1849 he used 30 tons, and in the winter of 1850, 40 tons, and with the latter supply he fed 283 ewes with gorse from the beginning of November to the latter end of February, besides his horses and cows. During the time he used the gorse he never had a single complaint regarding his stock, and they never were more healthy. They ate it greedily, and thrived well; and he was firmly persuaded that gorse thus supplied to cattle was equal in value to the best hay that could be given; besides, he calculated that the plant did not cost him more than 2d. per stone, 14lbs. to the tone, after cutting, carting, and grinding. He, however, found that the gorse, after being ground, soon lost its freshness, and fermented and turned sour; therefore the sooner it was given to the cattle the better; and it would be as well to grind it every day. In some instances, after being ground, and it had lain some time, he turned it over, and applied hot water to it, which revived it, and made it fit for use. The gorse generally was fit for food from November to the first of May. After the plant flowered, the cattle did not relish it. At the Royal Agricultural Society's show held at York some years ago, a

premium was offered for the best mill for crushing gorse; but after examining it minutely, he thought it so deficient that he would not have had it as a gift, as he felt convinced that nothing was equal to the stone and edge system. As an example, Mr. Moody, of Mill-shield, near Minsteracres, has a stone for crushing gorse, which is worked by the water-wheel, and it has been used with success for several years; and any party paying a visit to the farm may see and judge for themselves. In addition to this mill, there are five others at work in the vicinity of Black Hedley. With respect to his friend Mr. White, whom he once considered an enthusiast, he had completely changed his opinion of him, and thought that gentleman had displayed great ingenuity by affixing his stones for crushing gorse to a wheel of his horse-thrashing machine. After the experience he had had, he considered gorse was one of the most valuable plants the farmer could use, if it was cultivated as it ought to be. Nature presented the plant to view almost at every place, and it only required a little of man's skill to make it a most excellent and profitable means of food for his stock of all kinds. It was remarkable; but it seemed only one of those wise provisions which nature always makes, that the thorny part of the plant cannot be used in summer, and it was thus permitted to grow until winter, when it became arviceable at the time other kinds of food were becoming scarce. It also appeared indigenous to this country; for wherever he had travelled he had seen it growing, and especially on poor land. Its limits were extensive, as it grew even from the sea to the height of a thousand feet beyond its level; and its latitude reached from the far north even into Spain. He knew that at different times the attention of agriculturists had been drawn to the florin and tussac grasses for food; but was it not a surprising thing, that when nature presented the farmer daily with such a valuable plant as gorse, it should be comparatively neglected? He did not wish that they should receive what he said without searching into the matter for themselves; and in order to enable them to do so, and get some valuable information, he referred them to the following authorities, where they would find some excellent papers on the subject. The first was the Annual Register for 1762, where an account was given of cattle being prevented starving by the use of gorse; also in the same register, they would find articles written in 1763, 1771, and in 1787. In vol. 5 of the Highland Society's Transactions of 1820, and in vol. 15 of 1841 there were two excellent papers. There was also another paper in the Quarterly Journal of Agriculture of 1831, and in vol. 8 of the same work they would find another paper. In the Royal Agricultural Society's proceedings of 1846, there was also a very excellent paper. Mr. Burnett then concluded by stating that it was his belief that on poor land, if each farmer had five acres of it devoted to gorse, it would be found in reality the most valuable part of his land, as it would yield him the most profit.

Mr. WEEKS thought they ought to feel much obliged to Mr. Burnett for bringing the present subject forward. It was of considerable importance; and he had always had an idea that gorse was a valuable thing for cattle; but what was a great difficulty was the crushing of the plant, as many farmers had not stones to do it. If a suitable machine could be constructed, it would be of great service to the profession.

Mr. BELL testified to the experiment of Mr. Burnett, and stated that the plan had succeeded well.

The CHAIRMAN said that, as usual, they always got something of value from Mr. Burnett. He must confess that he never thought that gorse could be applied to the extent it had,

until he heard the statements of Mr. Burnett, and that too at only 2d. per stone. With respect to Mr. White, he could bear out all that was said as to that gentleman feeding his cattle on gorse, and as to their thriving on it. For himself he could not doubt the nutritive qualities of the gorse, but he doubted the practicability of crushing it, as it would not do to crush great quantities at once. The subject certainly had not made much progress; but, on the face of it, there appeared something worthy of the attention of the farmer, as a time might come when the ordinary supplies of food might become remarkably scarce, and when gorse could be resorted to in the emergency. It was necessary at present that the farmer should look into everything with great care, as everything touching pounds, shillings, and pence was of the greatest importance to him, seeing that, notwithstanding all his exertions, he had much difficulty to get on.

Mr. GLOVER, the secretary, thought there could be no question of the nutritious qualities of the gorse, and, as a proof, instanced how the late General Napier contrived to feed his cavalry horses, when other food was scarce. In the Royal Agricultural Society's proceedings there was a prize given to Mr. Roberts, of Bangor, for a paper showing how gorse could be grown as a regular crop, and with great profit. If that were so, he did not see why it could not be produced either in Northumberland or Durham.

Mr. STEPHENSON said that, although he had no experience in the matter, yet he thought the subject worthy of consideration; and as Mr. Burnett had brought it forward, he moved that a vote of thanks be given to him.

The motion having been seconded, it was put and carried.

The CHAIRMAN, after requesting the secretary to retire for a few moments, called attention to a matter which had been recently mooted regarding the propriety of presenting Mr. Glover with a suitable testimonial, for his long and valuable services to that society ever since its establishment. The subject had been named to Sir M. W. Ridley, the president, and he not only spoke highly of Mr. Glover's services, but, as a proof that he appreciated them, he consented to head the subscription with the sum of £20 (applause). He, therefore suggested that a committee be appointed to receive the subscriptions of the members, and to carry the object fully out.

After some conversation, a circular was agreed to be sent to the members on the subject, and the committee of the club authorised to receive subscriptions in aid of the testimonial, which would be presented at the annual dinner in January next.

The meeting then broke up.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—Allow me to express my concurrence in the views of Mr. Burnett, and other gentlemen of the Newcastle Club, "on the uses of gorse." Having proved its utility as food for stock, but discontinued it solely on account of the trouble and expense of preparation, I am induced to make the following remarks, in the hope of drawing the attention of some of our agricultural machinists to the subject.

I conceive the principal thing required to bring it into more general use is a *cheap and efficient* crushing-machine, capable of being worked by *one*, or at most *two* men. My reasons for preferring manual to other power are—

Firstly, that it is essential the gorse should be crushed daily, and not in larger quantities than would be consumed in twenty-four hours.

Secondly, that many small farmers could use gorse to great advantage with such a machine, who do not possess thrashing

or other machinery to which a more powerful engine could be attached.

Thirdly, that larger farmers, who may have horse or steam power, would find it more economical to use manual labour in preference to putting their horses to the thrashing-machine, or getting up the steam when not required for some other purpose.

Perhaps you or some of your numerous readers would inform me if there is a *really good machine*, of the description alluded to, as I have not yet seen one.

Apologizing for trespassing on your valuable space,

I am, yours truly,

JAMES BOURN.

Cleobury Mortimer, Nov. 30, 1353.

W A G E S .

No. XX.

THE EFFECTS OF THE EMPLOYMENT OF CHILDREN IN AGRICULTURE ON THEIR OPPORTUNITIES FOR OBTAINING SCHOOL INSTRUCTION.

What a never-ending subject are we upon! The more one writes, the more there remains to be written. "I projected a pamphlet, and lo a duodecimo!" for one point infringes upon another, and we cannot do justice to the question under hand unless we view it in all its many aspects.

And while human nature continues to be what human nature now is, there ever will be need for radical reform in all parts of the body social and politic.

All things human are imperfect, and contain in themselves the very elements of change and decay. The world moves from worse to better—from better to that final condition of completeness to which we gradually approximate. It becomes each of us to be very humble in his own esteem, and to be careful now, in view of such universal imperfection, he arrogates to himself for his opinion an exclusive *right*. We are none of us exclusively right—there is defection in the course of each; for although a man may walk up to the measure of his light, yet, if his light be not certain, but flickering, inconstant, and too often a dim rush-light, it is not to be expected that he will describe a straight path. And what illumination have we of this age but that of the morning twilight?

Cutting short my prefatory remarks, allow me to transcribe here a passage from the "Records of Creation," by Dr. Sumner, the present Archbishop of Canterbury, from which you will see that I intend in this letter to say somewhat respecting the education of the poor and labouring classes.

"Of all obstacles to improvement, ignorance is the most formidable; because the only true secret of assisting the poor is by making them agents in bettering their own condition, and to supply them, not with a temporary stimulus, but with a permanent energy. As fast as the standard of intelligence is raised, the poor become more and more able to cooperate in any plan proposed for their advantage, and more likely to listen to any reasonable suggestion, and more able to understand, and therefore more

willing to pursue it. Hence it follows, that when gross ignorance is once removed, and right principles are introduced, a great advantage has been already gained against squalid poverty. Many avenues to an improved condition are opened by one whose faculties are enlarged and exercised; he sees his own interest more clearly, he pursues it more steadily, and he does not study immediate gratification at the expense of bitter and late repentance, or mortgage the labour of his future life without an adequate return. Indigence therefore will rarely be found in company with good education."

I wish my readers to bear this paragraph in mind while we give attention to the effects of the employment of children in agriculture on their opportunities for obtaining school education, and also religious and moral instruction.

We may as well look over the minutes of the Committee in Council on Education, for a little statistical information.

Mr. Mosely, in his report on the Elementary Schools of Wiltshire and Berkshire, states that 66 per cent. of the children in attendance at school left before they were twelve years of age, 36 before they were eleven years of age, and 18 before they were ten. Beneath is a table, in which the proportions per cent. are given of the different ages in the aggregate, of the schools inspected in Wilts and Berks.

AGED		NUMBERS PER CENT.
		Aggregate of the Scholars in Wilts and Berks.
Under	7	37-29
Between	7 and 8	13-22
"	8 " 9	12-83
"	9 " 10	11-51
"	10 " 11	9-81
"	11 " 12	6-91
"	12 " 13	4-63
"	13 " 14	5-72
Above	14	2-29

The inspector for Middlesex, Bedford, Bucks, and Hertford gives the per-centage of children attending elementary schools above the age of twelve as 11-28, and that of children under eight years of age as 50-0. These figures are accompanied by this

remark, "That the children of agricultural labourers and common workmen, with few exceptions, do not remain in school even till they reach their eleventh year."

Mr. Bellairs, in his report on the counties of Gloucester, Warwick, Worcester, Hereford, and Oxford, states that the main difficulty to the educationist, is the great demand for juvenile labour.

Mr. Watkins, inspector for Yorkshire, shows that the per-centage of children attending school under ten years of age is 78.0; between ten and eleven years, 10.56; between eleven and twelve years, 6.23; and between twelve and fourteen years is 1.57.

Mr. Mitchel, reporting on the state of schools in Cambridge, Essex, Huntingdon, Norfolk, Suffolk, and Bucks, remarks that "the age to which the children of agricultural labourers attend school is so limited, that extensive acquirements in a teacher are not needed, and few men of active habits and mental vigour could support an existence where the labour and interest is so confined, and the emolument so inefficient."

From these facts we can draw but one conclusion — namely, that the effects of the employment of children in agriculture must be prejudicial in this respect, that it removes them so early from school. And we have then to bear in mind what a large proportion of children, owing to the poverty-stricken circumstances of their parents, never cross a school threshold.

It seems that the age at which boys usually go out to farm-labour is between seven and twelve. Many are taken from school to go to work before they reach the best class, and the majority of them soon after they have reached it. I have observed, that boys taken from school to be put to farm-labour can generally read pretty well, but can scarcely ever write. Where, as in dairy and grazing counties, the boys are required to attend the cows or cattle on a Sunday, they are prevented attending the Sunday-school, and are thus early—how too early!—removed from all opportunity of retaining the little stock of knowledge already gained.

It sometimes happens, when boys remain at the day-school later than the age of seven or eight, until they are finally removed, that they are taken to work in the field at particular seasons. This is a universal source of complaint and discouragement on the part of all schoolmasters with whom I have conversed. Mr. Austin, in his report, states that—"Girls are also sometimes, but much more rarely than boys, taken from the day-school to work in the hay-harvest. Girls are also frequently kept from school at certain times of the year, in order to attend to their younger brothers and sisters, whilst their mothers are employed in the fields. Boys and girls are also kept from school to help their mother glean-"

I am aware that it is difficult for farmers to do without child labour at certain periods, at least with their present notions; but I am in hopes that they will discover it in time to their interest to do with less of it, and that children will not be visible in our fields, save under the beneficial influence of some system of industrial training—when the education of mind and limb, that species of education most desirable, shall be united. The frequent interruption to which children are exposed in their attendance at school, cannot but be vexatious to the teachers and mischievous to the taught. Progress under such circumstances cannot be expected; for the mind becomes debilitated by thus playing fast-and-loose with school instruction, and at length estranged.

The masters I have consulted generally concur in stating that a busy field season empties their schools of two-thirds of their scholars, that the progress in each case is checked, and that children thus called away from their lessons are, when they return, invariably put into a lower class than what they occupied when they left.

Amongst practical folks it is a common opinion that, unless a boy begins to work in the fields when young, he never thoroughly learns his business. The age at which a boy should begin work is fixed by some at seven, by others at eight, nine, ten, and eleven. One gentleman who is an undoubted authority, thinks that eleven is the proper age for boys to begin farm-work. I take this opinion in preference to that which is in favour of employment at an earlier age; because the latter one seems to be recommended by persons who consider the boy's thorough knowledge of agricultural labour of more importance than intellectual improvement. "But," says my authority, "if the age of eleven is the earliest at which a boy may be put out to farm labour, without interfering with the instruction he may obtain at school, it follows that the greater number of boys are employed at an age which deprives them, on the average, of nearly two years' instruction, and at an age when they would belong to the best class of the day-school.

In allowing the justice of the boy's removal from school at the early age of eleven, I must insist upon one condition, which is this: that evening-schools shall be provided. To prevent a boy's religious and moral improvement being obstructed by his quitting school at eleven years of age, a punctual attendance to such a provision is essential. Carried with however much care up to the age we mention, and then—as so frequently occurs in the southern counties to which I have alluded before—exposed without a counteractive influence—alas! how shall I write it?—to the vicious instruction and example of home, his principle is immature to the severe test. What years more try the fixity of moral principles than

those in which external circumstances have so much importance with us—those, in fact, upon which we enter from the restraints of school to the period of manhood? One of the most important questions connected with the education of the children of agricultural labourers is, therefore, the practicability of continuing their education after they quit the day-school. The Rev. Mr. Austin, of Pimperne, Dorset, says, that “evening-schools seem a fit means for this purpose, in which with school instruction could be combined intellectual pursuits sufficiently attractive to wean boys and young men from their present habits, and of a description to elevate their moral character.” Mr. Austin’s evening school shows the alacrity with which, after the day’s labour, young men seek instruction, and the ease with which they may be kept from the beer-shop, and other vicious pursuits. I will conclude with his own description of it:—

“The evening-school I allude to is one established a few years ago in my parish, for boys and young men, whose time during the day was taken up by their work; and I have much reason to be satisfied with the result. They formerly paid fourpence per week: I am happy to say I am now able to let them come free. I observe that the young lads who were inattentive as children of the day-school now attend the evening-school, and are most anxious for instruction. The school is open from six till eight; and the young people who come home tired at five o’clock from work, take their meal and hasten to their school with manifest pleasure. This evening-school is open for the four winter months, beginning in November; and I feel it has been a most important advantage in one respect—it keeps the young man out of the beer-shop and other mischief, and finds him rational and instructive pursuit. It is held in the National School-room; and the scholars have the use of the books, desks, &c., supplied to the day-school, the master of which superintends for a little additional gratuity. The number of scholars of course varies; sometimes we have had between forty and fifty, another year not more than thirty: their age from eleven to twenty.”

No. XXI.

INDUSTRIAL EDUCATION.

But to continue the subject of my twentieth letter—I had said that if I gave way and yielded to the justice of removing boys from school at eleven years of age, I should insist upon the general establishment of evening schools; such efforts are more common than they were, and I rejoice in the fact: I know many. A young farmer of my acquaintance hired a large room, and himself attended two evenings a week for the six winter months, two hours each

evening, to instruct his own labourers and others in reading, writing, arithmetic, history, and geography. The progress they made was astonishing and their attendance most regular. Another young man threw open his kitchen two nights a week and taught with eminent success. Such facts are encouraging, and serve to show how much may be done in this way. The example is highly valuable, and if it causes any individuals to reflect upon the dangers to which youths, under these circumstances, are exposed, and reflection is followed by practical and personal exertion in the right direction, I shall indeed be most happy.

I am, however, for doing away with this fixed period, beyond which, boys shall not be considered eligible for school, but doomed to manual toil. By the judicious introduction of Industrial training, the instruction of the boy in matters appertaining to his daily craft might commence, if you please, so early as seven years of age; while the cultivation of his mental faculties may be extended far beyond the limit of eleven years. Both would be conducted together so that in muscle and in mind he would be growing a fitter workman, a man more likely to prove a credit to his country, and a happiness to himself.

How congenial is this system, with a definition of education such as that to which common sense can affix its seal! True education, as I take it, by giving to man the perfect control of his faculties, by enabling him to *apply* his knowledge, observation, and judgment upon the combination and arrangement of the materials around him, in the readiest, cheapest, and best manner, thus fits him to occupy his present position to the greatest possible advantage, and gives him the power of adapting himself to any or all of the varying circumstances in which Providence may place him.

If this definition is true, then is there truth in the system of industrial training answering to the expressed and manifest requirements of the labouring classes. That which fits a child for its future station and prospects, that which imparts the power derivable from knowledge, and teaches the art of applying it, is education. Such essentially is the education provided under the industrial training system.

“But” writes a school inspector, “against this positive mischief, arising from the employment of children at the age of nine, or even earlier, the very important fact must be taken into consideration, that from the time they begin to work, however young they may be, they very nearly, if not wholly, support themselves. The relief to the parents, particularly when the family is large, from the employment of their children, is very great. Any plan of education that tended to retard the age at which boys begin to work in agriculture, would seriously affect the physical condition of the labouring families.”

This is, indeed, a melancholy fact, one that reflects no credit upon our country, the stain of which we should be solicitous to burn out. Time for amendment, is it not? when the father's earnings are not sufficient for the support of the family, and his necessities oblige him to force his child to contend with him in the labour market, with a view to better the family circumstances. But even this difficulty is overcome by the industrial system. Since if the boys cannot absolutely work to a net profit, they can materially lessen the cost of their own maintenance, as is very well proved by experiments made in the Union schools.

I must request the patience of my readers, while I give them from the minutes of the Council on Education, some specimens of what has been and can be effected in this direction.

The Rev. J. P. Norris, in his General Report, mentions the school at Acton, near Nantwich, in this manner:—

“The girl's school has extended its industrial department since my last visit. On two days in the week, four girls are occupied for three hours before breakfast in laundry work. The apparatus is of the simplest kind. The girls cook a dinner occasionally; they invited me to dine with them on Thursday, and gave me an excellent dinner of their own cooking. Most of the girls in the first and second classes had made their own frocks. The boys continue to work in the garden; it comprises 1 rood 2½ perches altogether, and a more fruitful plot of ground it would be difficult to meet with. Six boys in it at a time work one or two hours daily. The first class of boys had some knowledge of chemistry, and agriculture, &c.”

Of the Lawton Industrial School, apparently the peculiar care of a benevolent lady, named Lawton, the same authority writes thus:—

“There are few schools in my district that please me more than this: two years ago, a laundry was added, and from that time to this, 6 girls have been employed, during 2 half days of each week, in washing the school pinafores, &c., and such clothes as their parents like to send (providing their own soap and starch for the latter). The industrial work has been recently extended, so as to include baking, household work, and such cooking as can be learned by preparing a dinner every Thursday; they not only cook the dinner, but calculate and set down the cost. Twelve ‘industrial girls,’ distinguished by rosettes on the shoulder, undertake these household tasks in turn, according to the following time-table.

6 girls washing and ironing, 7 hours on Tuesday and Wednesday.

2 girls doing household work 2 hours daily.

2 girls making bread 1½ hours on Tuesday.

2 girls cooking a dinner on Thursday, 3 hours.

Each girl leaving the school for service, and retaining her place 2 years, receives a present of half-a-sovereign, and at the end of the third year another half sovereign. No girl is recommended to a situation, who has not been 12 months in the industrial department.”

“Here then is a direct attempt to give the school instruction a specific bearing on the future employment of the children; and the result has been so sensible an appreciation of it on the part of the parents, that when last summer I recommended a higher scale of payment, and explained the reasonableness of the charge to a meeting of parents, and then put it to the vote, they were unanimous in favour of a higher rate.

The school fees were a penny a week: they are now—

Industrial and 1st class girls 4d.

2nd class 3d.

3rd and 4th class and infants 2d.

Widowers' children belonging to the parish 1d.

Widows' children belonging to the parish free

This school is self-supporting. But again of the school at Sandbach, Mr. Norris remarks “the industrial apparatus is very complete, and the training every way praiseworthy and successful.”

Of *field gardens*, Mr. Norris mentions that in connexion with Lilleshall school, containing $\frac{3}{4}$ of an acre, which is divided into 20 allotments cultivated by 20 boys, each finding his seed and having the produce.

“At Ipstones, there is 1 acre of land attached to this school, a smaller quantity than was at first proposed. The prejudices of the people at this place are against allowing their boys to work, and although we at first offered the land rent-free to the boys, there was great difficulty in getting them to take it. The boys are, however, much improved, and I have great hopes of success.”

The account given by Mr. Caird of the industrial class of boys on Lord Hatherton's farm at Teddesley, is deserving of notice, particularly the last sentence:

“I spent the afternoon and evening at Teddesley. My object was to see a gang of boys at work. I found them, 30 in number, between the ages of 11 and 14, thinning carrots with the hand, and afterwards binding oats, under the superintendence of a suitable labourer. I watched them for a couple of hours, and conversed with many of them. They appeared to work cheerfully and very industriously; their manner and behaviour delighted me; they gave me most intelligent answers about the farm work, but when I examined them in the old school work, I found they had forgotten it nearly all. But Lord Hatherton is most particular in requiring a certificate from the schoolmaster before anybody is allowed to join the class. I went away with a strong impression that, if the schooling were continued two or

three hours each day, along with this field discipline, a better training could hardly be imagined for boys above 12 years old, in agricultural districts."

The half-time system, in exact conformity with this, has been, I find, fairly tried and realized at Betley, 5 miles from the Crewe Station.

I take from a clever little note before me. "Betley, December 30, 1851. Immediately after your visit I proceeded to form an agricultural class on the half-time system. We began with one set of 4 boys, whose work was to be let out to the neighbouring farmers at the rate of 4d. for the half-day. I have not the least doubt but we shall be able to form a morning and an afternoon set in the spring. The farmers to whom I made application expressed their approbation of the plan, and of their willingness to give such employment as was suitable. The boys were accordingly sent for by Mr. —, November 12, to clear land after potatoes. On Monday the 24th, and the two following mornings, they were employed by Mr —, to pull and top turnips, and on Thursday by Mr. —, in drawing carrots. Each expressed his entire satisfaction with the manner in which they had done their work. Mr. — sent for them again, December 4, to finish his turnips. Friday proving an unfavourable day, they were at school morning and afternoon. Saturday, they were at work the whole day. Monday morning at school: the afternoon, they finished the turnips. On Thursday, December 11th, hedging, &c., for Mrs. —. During this time (13 half-days) they earned amongst them 16s. 4d. The overlooker was paid 6d. for each half-day; and of this, 3d. came from the boy's earnings, and 3d. was paid by the managers of the school. Each boy therefore received 3s. 3½d., as his share of the profits of the 13 half-days, and the overlooker was paid 6s. 6d. for his attendance; the only expense to the managers being half the latter sum."

This system is highly recommended by the Poor Law Board. It has been tried and, as Mr. Bager's Reports of the Training of Pauper Children in Lincolnshire and Nottinghamshire will show, with the utmost success. It is approved alike on economic as on prudential grounds.

What, then! we not only feed our paupers better than we allow independent labourers to feed themselves, but we educate them better also! This surely is mad work. Verily the premium is given to the lazy, and withheld from the worthy, to the derangement of all social principle, and the decay of that great tap-root of a nation's prosperity, the people's *self-reliance*.

If the child of the pauper has the advantage of this sort of training, surely that of the independent labourer is entitled to the provision. The provision in the latter case will merely be a loan, not a gift. All who view this case in a right light will own, that

it is far wiser to prevent pauperism than to remedy it.

Let the managers of our elementary schools look well to the matter, and they will render their efficiency more complete, and constitute them self-supporting; for they will attract more children, retain them longer, and secure the direct and cheerful co-operation of the farmers, nay, of all capitalists. This must naturally be so, since an education to be appreciated must be *manifestly* advantageous.

1st. It must be an advantage to the parents, satisfying their demand (a very false and unnatural one, but one which, as we are at present placed, must be admitted and remembered) upon the labour of their children. It is certain that all descriptions of labourers would wish to see their children receiving that kind of instruction which will further them best in their several callings. This would require that a prominence should be given to different handicrafts and studies in different localities. It is quite right that such a distinction should be made, and that a rural and a manufacturing school should have a peculiar character.

2dly. An education that will meet with the support of the farmer must satisfy his requirements for better servants. "The gulf between the school and the workshop is too wide"—the preparation of the one should have some positive reference to the requirements of the other. Hear the farmer's case:

"I am a farmer, and I find it to be a complaint with those interested in education, that farmers as a class do not give them the assistance that they might. The reason I believe to be, that the present system is so obviously ineffective, that, till there is some alteration, they will not lend more help to that which, in nine cases out of ten, is thrown away. We do not find our boys, when grown up, and as labourers on our farms, to have acquired (what ought to be, I think, the object of their education) *any habits of industry, honesty, and fair dealing between man and man.*"

And 3rdly. An education to be really serviceable must fill up that *hiatus* before-mentioned, between the ages of 11 and 21; the period during which, under the present system, all the good instruction inculcated in early life is swamped, and the little vessel with its first cargo of good motives and principles becomes a wreck and a castaway.

But if the farmers complain of the education of the present day, why do they not set about in earnest to remedy it? The funds, in some measure, come from them; and if schools are well managed, they will be as profitable speculations as any man can engage in. It is preposterous for a man, with one, or two, or three hundred acres of land, to sit down and refuse his annual guinea to the school because the attendance falls off, and its results do not answer

his expectation. It should not be thus—this is pure cowardice, and insufferable selfishness. Waste not your money upon a worthless system; but give your mind to making it what it should be.

If you think it desirable that there were means devised for carrying the boys on till they are much older, under the eye of a master, and, at the same time, of enabling them to be earning bread by the sweat of their brow, and this as a part of their edu-

cation, lose no time in setting to work to reform the old system and introduce the new, which I agree with you is the only one that will be found to serve the purpose of this country.

The sun of success shines upon many interesting "clearings" already made in the bush-land of prejudice and ignorance. There are some fine spirits beforehand with you, in this work; therefore be up and doing.

F. R. S.

CAN THE FARMER ECONOMISE HORSE LABOUR?— EMPLOYMENT OF OXEN.

If the adage be true, that necessity is the mother of invention, it is no less true that "self-interest is the true perpetual motion." It is difficult, indeed, to say whether stern necessity, or powerful motives of interest, act the most effectually in impelling men to invention and discovery. The period of the farmer's difficulty, during the years 1850, 1851, and 1852, and more especially the two former years, were not remarkable for any agricultural discovery. Guano, and dissolving bones, and autumn cleaning and subsoiling, and green cropping, were all due to a period antecedent to this; nor did deep drainage owe its origin to the necessity of those times of pressure. The question is, will the new state of things, with prices higher than they have been, with about five* exceptions, since the commencement of the present century, now more than half passed away, induce the farmers to shape some new mode of making money by growing more produce at less cost? Will the price stimulate them not only to improve in general, but to go beyond this, and discover some royal road to corn growing, enabling them to save money, or time, or both, to produce at less cost and in greater quantity?

The experience of the last three or four years shows that we do not grow corn sufficient for our own population. We import what approaches to nearly five millions of quarters of corn; it ran, if we remember right, and we are speaking off the book, to some 4,800,000 quarters and a fraction over; but assuming that we have just a deficiency this year double that of an ordinary year—a very moderate calculation—we shall require about 10 millions of quarters of foreign corn for our own consumption.

Now can farmers, with corn at the stimulating price of 80 shillings per quarter, invent any mode of realizing to themselves the amount which is spent in this deficient season? Taking the average, say 5 millions of quarters, and assume it to cost one-

half of the present price, or 40 shillings per quarter, will not the sum of £10,000,000 (ten millions) be enough to tempt the farmers to make a desperate effort to grow corn to realise that sum, instead of sending for it to the valleys of the Mississippi or the Danube, the far distant plains of Poland, or the shores of the Black Sea?

Let them look about, and see if they can economise expenditure. They are consumers of corn to a very great degree themselves. Every acre producing either twenty or forty bushels, consumes two bushels at least of seed corn; every labourer consumes one quarter of wheat; but every *horse* consumes either an acre and a half of corn or its equivalent—some horses far more; and these are on every farm.

Can the farmer economise horse labour?

A Mr. John T. Osborne wrote a strong pamphlet in 1847, on the "Food Question," which, theoretical as it was, contained some of the most startling facts we ever remember to have seen, and the object of which was to prove that from 40 to 50 millions of pounds annually were lost by feeding and working what he called "unproductive horses."

We once remember expostulating with a farmer on his heavy horse stock, and told him that his horses were costing him £400 per annum. He started at the expression, more from amazement than displeasure, for he did not credit the statement. When we sat down to calculate 20 horses at £25 per annum each, and asked him if he would undertake to keep horses for that amount, he began to see that £500 far more nearly represented the annual cost of his horses, than the sum we had named, and he was glad to dismiss the subject.

Taking M'Culloch's estimate, copied as it is from Middleton's Survey, so far back as 1815, of the horses of this country employed in agriculture at 1,200,000, and estimating the keep of these at £25 each, the writer made out a sum for their keep of £30,000,000 sterling. He supposes, and correctly,

* In 1805, it was 88s.; in 1810, 106s.; in 1812, 122s.; in 1817, 96s.; and in 1847, it was near the latter price.

that M'Culloch's estimate is too low, and reckoning 5 horses to every 100 acres of arable land in Great Britain and Ireland, or 50,000,000 acres, he obtains 2,500,000 horses at £25 each, costing in fact £62,000,000, including Ireland in his estimate, which M'Culloch did not. He then went on to show that these horses were working one-third of the year, while they were to be kept for 365 days, showing each horse being unemployed and unproductive, though consuming food, for a period of 6,360 hours per annum. Taking this proportion for his sum total, he makes out that of the 62 millions of pounds, £45,847,750 is totally unproductive.

We ought to have said his object is to put farmers out of love with such an amount of horse labour, and to advocate the substitution of steam power; but there is a still more forcible way of putting it in times of scarcity like these. If we take each agricultural horse as consuming five quarters of oats only, we leave out all his grass and dried food, for corn cannot be given without green crops; but assuming their oats to be consumed on an average by a reduced estimate of 2,000,000 horses in Great Britain and Ireland, we have the enormous quantity of 10 millions of quarters of oats consumed every year by the horses employed in agriculture, which would be more than equivalent if produced in the shape of human food to supply all the deficiency of corn this country ever did, or probably ever will, experience in the ordinary course of years.

Now here we arrive at an important starting point. Can not the number of horses for agricultural purposes be diminished?

To entirely remove them is not the question, at least, as far as our present state of knowledge is concerned; but if they can be at all diminished, it is worth the most serious consideration of the farmer, and is a vital question as regards the whole community.

A mode not altogether unpopular, of diminishing the quantum and cost of horse labour, is the substitution of the ox for the horse. Thus, it is urged, in taking an improving animal, and putting it in the place of a deteriorating one—in another point of view, obtaining the labour, or power used on the farm from elements necessary to the existence of the farm itself, the making of its manure, and the consumption of its green crops. A recent advocate of this measure is a Mr. Stokes, land agent of the City of London, who addresses a short pamphlet, denuded of preface, of some ten pages of not very closely printed octavo, to Mr. Mechi, in which, by calculations founded on thirty years' experience of ox labour, he makes out a gain by their employment, as regards their comparison

with horses, of £87 4s., at the end of eight years, on a small farm of 100 acres.

Mr. Stokes starts off with the idea that the subject is a novel one. He says: "I have looked over various works, in which one might naturally have expected to find notices of some description relative to this animal as a beast of draught; but although I have explored the contents of such publications as Loudon's Encyclopædia of Agriculture, Stephens's Book of the Farm, and Wilson's Rural Cyclopædia, I have found nothing relative thereto; nor have I by enquiry at several publishers', viz., Longman's, Baldwin's, Blackwood's, and Ridgway's, met with anything further than the customary answer that 'nothing of the kind is published.'"

This gentleman is evidently not a reader of agricultural works; for though there is not perhaps any particular treatise on the exact question of ox *versus* horse labour as such, there are few agricultural works of any standing, which profess to embrace the principles of any system of agriculture, that do not comprehend the bearings of the question. From Sinclair, and even from his predecessor Parkinson, down to the publications of the Farmers' Series of the Society for the Diffusion of Useful Knowledge, published by Baldwin himself, the question has been discussed, not to mention the incidental notice of it in the transactions of almost every Society from the Board of Agriculture to the present time.

Mr. Walker, of Mellendean, in Roxburghshire, had tried the system twenty-five years before 1821. Mr. Madison, the President of the United States in 1819, detailed his practice of this system in the "American Farmer." As old a farmer as Lord Somerville advocated the plan in his day; and Sir Thomas Carmichael, about the same period, showed the superiority in a matter of cost, of ox over horse labour. The Bath and West of England Society, that old and venerable body, now so successfully resuscitated under Mr. Acland's auspices, gave testimony to their value, as "cheapest and best." The Dublin Society did the same in effect; and Findlater, in his Survey of Peebleshire, for the Board of Agriculture, discusses the question, and condemns oxen, only afterwards to retract his objections and confess himself a convert to ox labour. The Leicestershire report gives the prominent mention of successful ox labour; the Nottinghamshire report does the same. The North Riding of Yorkshire report, and that for Herefordshire follow, in the same strain; while the surveys of Gloucestershire, of Norfolk, of Essex, of Oxfordshire, of Shropshire, of Cornwall, and of Sussex, all more or less allude to the successful application of ox labour. Mr. Brown of Markle, Mr. Parkinson, and the Middlesex reporter take against them; while Sir John Sinclair, as we said, closes our list with a report, in

the appendix to his work, by a paper on the Comparison between Horses and Oxen as Beasts of Draught; moreover, Arthur Young, in his Annals of Agriculture, also discusses the question.

We might go on for a long time quoting authorities *pro* or *con.* on this subject, as we think if there is one topic which the agricultural world has exhausted it is this very subject, which it fully discussed at the commencement of the present century.

The farmer king, as he was called—George the Third, left off the use of horses in agriculture to a great extent and substituted oxen; so that Mr. Stokes has certainly trodden no new ground, in bringing before the agricultural world the utility or economy of ox labour; and we must say that, to us, it seems far too slow a prospect for Mr. Mechi, who had rather hear of steam and machinery consuming carbon in the shape of coal and propelling by steam, than dream of returning to the antiquated and leisurely-treading ox. As likely, indeed, to see him advocating the common stage waggon as a substitute for the express train for passenger transit, as to find him goading on his yokes of oxen.

Into Mr. Stokes' calculations we shall feel it our duty carefully to go; but before we do so, we must premise that ox labour is contrary to the spirit of the age.

When oxen were ordinarily kept to five or six years of age before they arrived at maturity, it might be worth while to consider if a little work should not be got out of them; but now, when improved breeding and grazing have been attained, it seems as if no place were found to employ the cattle in labour. He is a bad farmer, or has a bad trade, who cannot sell fat oxen at two years old, and three years old is monstrous.

To employ oxen in farm work is to take them away from the purpose they are evidently intended to fulfil in the present age, and, beyond all controversy, would prove a vast diminution of that rapid turning over of capital, and that repetition of profit, which every good farmer has now a right to expect.

Nor must the horse be taken as deteriorating. Let young horses be broken and used, as cattle must be, and sold say at six, after working three years on the farm, and they will be found to increase and not decrease in value; and yet this is the item, and the only item, adduced in favour of the economy of ox labour.

The eligibility of the employment of oxen as a substitute for horses, in the operations of the farm, resolves itself into the two following points—which is the most economical in a pecuniary point of view? and which is most desirable, assuming the point of economy to be settled? for it is evident

this is not the whole of the question under consideration.

There are many conclusions afloat on the question, from, as we said, the middle of the last century, to the calculations of Mr. Stokes, given in his pamphlet, published or rather written in August last. Having had all past experience, as well as all the general knowledge attained since, to assist him, he takes for his basis a period of eight years. He supposes horses to be purchased at six years old and the oxen at the age of two years, and by that period the one would have arrived at the age of ten and the other at fourteen years; but as the oxen will sell best at the age of six, he changes these once in the period, and hence works them four years and purchases others to replace them, after premising that he makes no charge for veterinary bills, nor does he make any provision for replacement or death. This however, may be fairly omitted, for there are numbers of farm horses performing the whole of their work in the most satisfactory manner, *years* after the age set down by Mr. Stokes as the proper victims of the knacker. Without entirely consigning them to this, Mr. Stokes values them at £5 each, and his calculation stands thus:—

FOUR HORSES.	£	s.	d.
Four horses at £25 each	100	0	0
Set of harness for four horses	24	0	0
Blacksmith and harness mender, £4 4s. per annum for 8 years	33	12	0
Attendance carter 12s. per week, for 8 years	249	12	0
Under carter or strong lad 8s. per week, for 8 years	166	8	0
One year's keep £104, for 8 years	832	0	0
	<hr/>		
	1405	12	0
Deduct from this cost the sale of four horses aged 14, at £5 per head	20	0	0
	<hr/>		
	£1385	12	0

He then gives the following calculation for oxen—

EIGHT OXEN.	£	s.	d.
Eight oxen bought at 2 years old £7 10s. each, to be sold to the grazier after 4 years' work	60	0	0
Eight other oxen bought to replace them	60	0	0
Set of harness for 8 oxen at 30s. each	12	0	0
No blacksmith, but harness mender at £1 per annum for 8 years	8	0	0
Ox man or carter, two at 10s. each per week, £52 for 8 years	416	0	0

Two boys, 4s. each, £20 16s. for	
8 years	£166 8 0
Keep of 8 oxen £2 per week, £104	
for 8 years	832 0 0
	<hr/>
	1554 8 0
Deduct from this cost the sale of	
16 oxen, aged 6, at £16 per	
head	256 0 0
	<hr/>
	£1298 8 0

Now, if this were so, there would be a clear gain of £87 4s. at the end of eight years ; and assuming, as Mr. Stokes does, that the rent of the 100 acres is £200 per annum, the saving is taken at very nearly 6 per cent. of the whole rental, or a little more than 2s. per acre.

But we must be allowed to demur to two points in this gentleman's calculations, which will, if we mistake not, annihilate the difference, if not throw the actual balance the exact converse of what he has made them. We begin with expressing our conviction of the unfairness of commencing the proceedings by purchasing his horses at six years old, the full period of the animals' working maturity, finding them broken and ready for work the very moment he brings them from the fair, and comparing them with two years old oxen, all utterly unfit for work, and with a considerable time to be lost and expense to be incurred in breaking. If two years old oxen are taken, why not take two years, or at most, three years old horses? This will considerably reduce the estimate for the horses. Then we can hardly see how four horses' harness can cost £24 and 8 oxen's harness only £12 : the most costly parts of the harness, as cart saddles, &c., will be common to both ; but if the oxen's harness is taken at one-half of the horses', that for eight oxen being put in fact at the same as that for four horses, it will be, we think, much nearer the truth. Assuming the repairs in a similar ratio, and we shall have only the saving of blacksmith's bills as far as shoeing is concerned ; but even this, when the oxen have to travel on hard roads, will not be entirely confined to the horses, as some of the cattle must also be shod. Nor can we see how the difference can take place in the wages. We know of no reason why the two carters, when oxen are used, should not be taken at the same wages as when horses are employed ; for if a carter has 12s. per week when he has horses to follow, we can hardly see how the mere fact of having oxen instead will induce him to take less. And then Mr. Stokes admits that four hands, instead of two, will be necessary where oxen are used.

Again, he puts the keep of the eight oxen at

the same as the four horses. We cannot see the fairness of this. We know of no reason why, if oxen are to do the same amount of absolute work, they will not take nearly the same amount of food ; nor will anything ever be gained by stinting either the one or the other.

It also appears to us that partiality is shown in the list of expenses, on the oxen side, in another way. We think £7 10s. a somewhat small price for two-year-olds, fit for the farm-work ; and if in the course of eight years the prices varied, it would be far more likely to be above than below the sum stated.

Furthermore, we incline to the opinion that, as regards pure economy, there is nothing gained by the employment of oxen for labour instead of horses ; and how far any other expedient can render it desirable, we shall proceed to consider.

In endeavouring to set Mr. Stokes right with our readers, in his estimates of the comparative economy and efficiency of horse as against ox labour, we must, having protested against some of his calculations, enter a little more into the elementary question of cost ; and before we do so, it will be necessary to bear in mind, that though in the one case we are keeping an animal which will ultimately be useful for human food, and in another one which never can be, yet it is not the most profitable to keep the food-producing animal for a period anything like so long as is absolutely essential to his usefulness as a beast of draught. To sell a beast at two years old fat, or at most at two and a half, ought to be the object of every breeder ; and something is radically wrong, either in the breed, the pasture, or the management of the animal, if he does not. Hence the beast, though getting larger, and able to carry more food on its back when older, is not really food-producing ; for by the time it will be six years old, it has really displaced three animals which might otherwise have been fed on the same food it consumed. As a mere food-question, therefore, we are not sure that it is a saving at all on national grounds.

We think arithmetically, however, that the real state of the question is somewhat as follows :—

	£	s.	d.
Cost of keeping four horses per annum at £23 each	92	0	0
Decrease in value £3 each per annum			
Blacksmith, farrier, saddler	12	0	0
Man's wages 12s., boy's 8s. per week ..	52	0	0

Total cost of four horses per annum. . 168 12 0

This is taking an animal view of the case ; and applying the same principles to the ox labour question, we have the following results :—

	£	s.	d.
Cost of keeping eight oxen at £15 } per annum each }	120	0	0
Saddler, blacksmith, farrier }	10	0	0
Two men at 12s. each, and two boys } at 3s. each per week }	78	0	0
	<hr/>		
	208	0	0
Deduct increased value of eight oxen } at £3 each }	24	0	0
	<hr/>		
Total cost of eight oxen per annum	184	0	0

Then taking from this the cost of horse labour £168 12s., will show a difference in favour of horse labour of £15 8s. per annum. Nor is this all. The work is more rapidly and expeditiously done in busy times, as seed time, harvest, turnip and hay time. For ploughing, carting corn, stacking hay, and rapid walking, the horses will beat the oxen hollow. Time saved, it is well known to every practical man, is the great element of success in farming—it saves a season, it secures many a crop, which a slow, hesitating dreamy farmer will lose. *Energy is everything in farming*, but no extra rapidity of action in the most favourable season can be exercised where horses are supplanted by the honest but slow and heavy yokes of oxen.

It may be readily granted that there are operations where oxen are invaluable. They will tire out horses on very heavy land, where all labour must necessarily be slow; but then heavy land is fast giving way before drainage and ameliorating systems of cultivation, and therefore the less necessity for any such slow processes.

But for subsoiling, for drain-cutting machines, for very deep ploughing or trenching, for using the digging-machine, or possibly in some cases for Biddle's scarifier or Crosskill's clod-crusher, the ox will be preferable to the horse or the team of horses, because of the great superiority of power at such slow work.

These, however, are all exceptional cases, and can only make out a strong reason for a combination of horses and oxen so long as soils remain untractable, to be discarded when they have arrived at a proper state of improvement.

Mr. Stokes will perhaps say the calculation is incomplete because we do not take the first cost of horses and oxen into account at the outset. This, however, is of little consequence. The generality of farmers breed sufficient of both, for the one purpose and the other; and therefore, taking the expense of rearing, &c., at half for oxen that horses will cost, they will be very much on a par. But if two-year-olds are bought in each case, the cost will not, it appears to us, be so very different. Eight oxen at only £8 each is £64, and we are not mis-stating the fact when we say that two-year-olds cannot be bought for that sum. The two-year-old colts for draught will cost £15 to £16 each; both will be to break, it is true, and the oxen may a little sooner be got to work than the young horses, and do more the first summer; but if the horses were sold off at say six—kept, in fact, as long as the oxen and sold off, there would not be any deterioration in price, but a great increase in value. Thus, if three-year-olds and broken colts were purchased, say at £21 each, and sold at six years old, they would be worth, if judiciously purchased, more than £3 per annum increase in value, or £30. To make the comparison at all fair, the cases must be strictly parallel.

Nor are we certain that much is gained in risk of loss. Assuming the horse to be more liable to disease than the ox in a twofold degree, which we think no one would assert, we have the chances of eight oxen against those of four horses, again rendering the risks exactly equal. But when we take the present liability to pleuro-pneumonia, and to the mouth and foot disease in cattle, we might reasonably infer that often in a busy season the farmer would find he had to depend on something else than his cattle, owing to these causes.

We are not prepared, however, to say that on strong-land farms a pair of oxen might not be useful along with the horse team. The heavy and slow work might be very satisfactorily left to them, while the lighter horses would more rapidly perform the kind of labour requiring rapidity and activity in its performance. We do not think, on the whole, that Mr. Stokes' recommendation adds much to the practical knowledge of the agriculturist.

THE P O U L T R Y S H O W S .

The many poultry exhibitions now starting up, and to which reference has already been made in these columns, are opening the campaign with every promise of a successful issue. Their supporters are returning once more rapidly into the realms of common sense. They are gradually coming to

question whether, after all, the sovereignty of King Stork is the only one they should acknowledge, or if there be not others quite as worthy of their allegiance. The comparison is surely telling against this once mighty bird, and the most he can now expect is but a divided empire. The poultry exhi-

bition of a few months since was enacted, like the entertainment at a country theatre, with one grand "star," engaged specially for the occasion. In him all the interest centred. The other performers had, of a necessity, to appear, and make up a show; but no one noticed them. Every eye looked for Hamlet, and Hamlet alone. He enjoyed a name and a price—commanding his forty or fifty pounds where others took hardly as many shillings. This King Stork was the Cochin-China fowl; this great star, that all fashion followed so obediently, was the Cochin-China. Dorkings, Spaniards, and Game birds were but too glad to play up to him, and to gather those crumbs of profit he would deign to spare them.

We were bold enough from the first to doubt the real superiority here so strongly assumed. While artists were painting his picture, and authors singing his praises, we still felt compelled to press "the reason why?" If there should be a mistake, it was one unquestionably that was taking the worst possible form. This fashion was to be a national advantage. It was to be the common good that people were found to buy chickens at thirty and forty guineas a-piece; and those that hesitated to do so were unworthy of their country. But why these Cochin-China chickens only, at thirty and forty guineas each? Take the Dorking, the Spanish, or the Game, and where was this immense "pull" in favour of the latest arrival? Was it his beauty of form? Decidedly not: beauties he might have, but they were not those of personal appearance. Was it his delicacy of flavour? Decidedly not: delicacy of any kind was scarcely within the catalogue of his graces. Was it economy simply—the little it took to feed him up for the table, and the way he could contrive to pick this up for himself? Decidedly not: if the Cochin China was a big bird he was a proportionately big feeder. One advantage, however, was admitted to him from all quarters—and this was his prolific recommendations. That is to say, in other words, when you gave the thirty or forty guineas for him, it was with the full conviction that you were buying up a rarity, with which, providing he only acted up to his character, the country must be overrun in less than twelve months.

The full force of this absurdity struck us on our visit to the Birmingham Show, just previous to last Christmas. The mania was at its height, and we spoke of it as strongly then as we do now. In the farm-yard family, poultry, perhaps, had not come in for that share of favour it should have enjoyed. The farmer himself might look a little more to it; but we cautioned him that he must not expect to find the philoso-

pher's stone in a hen's egg. We plainly told him to leave these high-priced articles alone, and to look about for something, perhaps quite as good, at a little less money. None but those connected with the business of a paper like this can imagine the amount of tribulation we were thus bringing on ourselves. Two or three gentlemen took the matter as personal; went on some way to deny what we had advanced, and hinted with tolerable distinctness of expression that we knew but little of that we were talking about. The influence of fashion was strong on them; and, could they have had their will, there would not have been a farmer in England without a five-and-twenty guinea bird in his yard. Others, again, though more lenient, "were afraid we were retarding progress"—"hardly acting up to our own principles as the tenant-farmer's advocate"—in which capacity it was no doubt our duty to assure him that nothing could pay better as an investment than Cochin-China chickens at twenty guineas a-piece.

We felt, on the other hand, it was a hazardous business that he had better leave to those amateurs who were already going so boldly into it. He did so. Still it has no way followed that because he would not purchase certain sorts at humbug prices, that this poultry movement must end, so far as he was concerned, in a failure. The result is exactly the reverse. The poultry shows, we repeat, are now becoming daily more legitimate and useful in their character. The fancy reign is all but over, and a man who wishes to improve his breeds may now do so without any great violence to his feelings or his pocket. One of the best, as one of the first meetings of this season, was that recently held at Colchester. The show of birds of nearly every variety was said to be very good; but what we would chiefly call attention to here, is, the expression of opinion at the dinner which followed. Almost every speaker had something to say "appropriate to the occasion," as some preference to give, from his own experience in the pursuit. Mr. George Round, whose health was proposed as "the founder of the Institution," said, "Although they had not come to the real question as to what were the distinctive merits of the Cochin Chinas, he thought it was admitted throughout England there was no fowl could come up to the genuine Dorking in its prolific properties." Mr. Attwood "preferred the game fowl—there was no bird equal to it, and he would always exhibit it." The Reverend G. Wilkins "thought the most profitable were the spangled Hamburgs, which would lay eggs all the year round if properly managed. They were very delicious to eat, as very beautiful to admire." Mr. Caldecott's experience was, that "there was no bird so profitable as the

Dorking." We have ourselves frequently instanced the recommendations of this Dorking fowl, certainly first favourite at Colchester. Mr. Fisher Hobbs thus explained why he preferred him :—

" He had tried all kinds, and had come to the conclusion that there was no bird so fit for common farm premises, and which the farmer could call his stock, equal to the Dorkings. He believed it was the best bird to place in the farmers' hands as domestic poultry. No doubt the Cochins had certain properties; they were good brooders, and produced eggs at a very early period of the year. For that purpose they were good; but when they came to consider the great amount of food they consumed, and the inferior quality of their flesh, he believed, for general purposes, they would not equal the Dorkings. There were other breeds beneficial for certain localities and certain purposes. He thought the Spanish was a nice bird for a gentleman in a town, or inn-yard, as it required warmth and would produce a great number of eggs; it grew very slowly, but when it came to maturity was a nice bird upon the table. One of their exhibitors, Mr. Punchard, had made more out of a few Cochins China hens than he had out of his flock of 600 breeding ewes; but they could not expect that the high price that enabled him to amass that large sum would continue, and therefore they must give up the idea of that extravagant price, although at the present day five guineas for the male bird was likely to answer the purpose. The Dorkings were in the ascendancy, while the Cochins were going down."

We believe we are justified in saying that if Mr. Hobbs had a prejudice at starting with them, it was in favour of the Cochins. The result of his experience comes to what we advanced twelve months since—not only the same argument, but

almost in the same words—"The great amount of food consumed by the Cochins—the inferiority of their flesh—and the fitness of the Dorking for common farm premises." If there was another point we endeavoured to impress upon our friends it was that they must give up any idea as to the continuance of "that extravagant price."

We have only to add that our extracts from the Colchester Meeting are not picked out merely to suit one certain purpose. We quote every opinion we can find reported as to the excellence of the different breeds of poultry. Amongst these it will be seen the Cochins China experiences the most cruel of all treatment—neglect. He is never mentioned except in a comparison; and that is certain to tell against him. Our own opinion is still that his chief merit, after all, will be found for a cross. In all his overgrown native purity, with his buff plumage, his feathered leg, and his sonorous note, we rate him but lowly. We should hesitate long ere we went up to that five guineas Mr. Fisher Hobbs assures us yet may be ventured to, on certain occasions. In so far opposing the outrageous value put upon this bird, we feel that we have been denouncing a humbug; that it was to the farmer's interest to leave to itself. It is satisfactory, no doubt, to find our impressions so fully confirmed; but yet more, to be able thus early to congratulate the poultry world on its return to the limits of fair profits and common sense.

THE SMITHFIELD CLUB CATTLE SHOW.

SHORTHORN CATTLE.

The shorthorn saddle of this year carried away the chief prize in the gold medal as the best beast of any breed, most justly, thus rescuing that celebrated breed from the very general imputation of having retrograded for some years past. The county of Wilts is not a breeding district, and much less for shorthorns; yet Mr. Stratton has been very successful for a long time. The prize ox of this show was not fashionable in the colour, being a vulgar red, with sparing streaks and spots of white. The symmetry however was most exact: broad and level back, round shoulders, and well obliqued, short neck, small head, and tapering muzzle. The posterior width of twist and buttock supported the shorthorn character, though not particularly so; the short tail was a slight derogation. The flank was comparatively lean, and the side paunch too projecting. The bareness of the point and face of the shoulder remained, as is usual in the shorthorned cattle. The chine was very full and deep, and the opening of the short ribs was well fleshed over. The short opening between the ribs and hook-bone, and a full level covering of flesh which hides the small vacant space, is an essential property in a fattened

carcase of cattle. The animal is prepared for the special purpose of producing beef; and it must be placed on every part of the body that will receive it. The case is wholly different with horses, which are intended for exertion: a very considerable latitude may be allowed in that respect, in order to procure a lengthened action of movement.

The animal girthed eight feet eight inches, and measured in length five feet four inches; thus showing very moderate dimensions in both sections. Not the size or lumpy fatness was to be admired, and was not found; but the very even fleshiness of the carcase was worthy of every praise that was obtained, and reflects great credit on the breeder and feeder—in this case, as always should be, united in one person. Much more refined shorthorns are found than Mr. Stratton's; finer and more glossy in the skin, and more fashionable and attractive in the colour; but for general purposes no equal competitor has yet appeared.

This animal gained the first prize of £25, and silver medal to the breeder, with the gold medal as before mentioned (in the class above three years old).

The second prize of £10 went to a very good animal

belonging to Mr. Frost, of West Watling Hall. This animal showed well, in a much more fashionable colour than Mr. Stratton's, and in most points but little inferior. The top of the shoulder was narrow and pointed, and the fore point bare of flesh. The back ribs and hook bones were uncommonly well covered with flesh, levelling the back, and widening the rump. The twist was wider than in the shorthorn medal ox, and the bushy tail was very gracefully suspended. The horn, ear, and forehead were very superior, but the lower forehead was narrowly bridged to the muzzle, which was black, and formed exceptions to the general symmetry. The whole frame constituted a very superior animal, and well deserved the prize. The girth was eight feet three inches, and the length five feet ten inches. The narrow fore-top of this animal formed the objection to the carcase.

In the class of shorthorns below three years old, the first prize of £25 went to Mr. Stratton for an ox, of a colour nearly wholly red. The shoulder was much narrower than of the gold medal ox, showing a very large inferiority, but with a very wide chine. The body was deep rather than cylindrical, and the flank depending rather than prominent. The posterior width was deficient, and also the perpendicular upstanding of the hind legs in the shorthorn cattle. It was a good fleshy carcase; in girth eight feet four inches, and in length five feet. The tail deforms Mr. Stratton's oxen—short, and wanting in bushiness.

Among shorthorned heifers the first prize went to Mr. Philips, of Wantage, for a wholly red cow, and of most complete symmetry. The carcase was uncommonly flat and level, without any lumps or protuberances of fat; shoulders round and well covered both on the top and points. The head showed much beauty and refinement; the neck was shaggy and thick. The width of loin was extraordinary, the under-belly very straight, flank full and quite properly appended. The leg bones were of a strength approaching coarseness, but constituting no deformity. The very straight face and rather short neck formed the only faults in this animal. The girth was eight and a-half feet, and length five and a-half feet, showing as large a carcase of fine useful flesh as ever was shown—not exceeding four years old.

The second prize animal of £5 was a wholly white cow, which was very much admired. Many opinions preferred the beast to the first prize, and a difficulty might occur in the decision. The body was more fleshy in the touch, and the shoulder was rounder and better covered on the top and back and fore points, but the neck was short and leathery, showing a coarseness. The head, ear, and horn were unexceptionable in a proper refinement. The width of the whole length of back was extraordinary. The thigh declined a little in width below the rump of fat, but the fore-ribs were covered almost beyond precedent. The girth was nine feet two inches, and the length six feet.

A nice competition must have existed between these two cows, in deciding the prize. The majority of extra-judicial opinions reckoned the second prize to be

the best beast in the show; and with that verdict our own judgment agreed. The direct front view of the animal exceeded our recollection of twenty-one years at the show, in the depth and width of the shoulders, and breadth of top. The hind quarters did decline a something. In these parts the first prize was superior; but in the fore-parts the second prize was immeasurably the best beast, and not only over the first prize competitor, but beyond any beast in the show-yard. The sum of £5 is a pitiful compensation for such animals: the amounts should be quintupled. These two beasts formed the only nice competition in the show of this year. Many opinions would have preferred the second prize animal to the gold medal.

Among the shorthorn cows above four years old, the first prize was awarded to a light-roan-coloured cow, of very large dimensions. The barrelled symmetry failed in competition with the last-mentioned animal, though superior in some points. The loin was uncommonly well covered, and the fore-ribs, and also the fore-shoulder. The neck excelled the last animal's, in being finer, though the cheek-bone was very wide. The chine was deep and large, and the head very properly refined. The girth was 9 feet 2 inches, and the length 6 feet 10 inches. This beast gained the gold medal, as the best cow.

The second prize went to a cow of very inferior fore-quarters, and bare in the shoulder. The colour was the most fashionable of all the animals shown—viz., a strawberry-roan, and darker on the neck and head. The back and ribs were well covered, and the flank was properly set. The fore-ribs were lean, and the bareness continued over the shoulder. The girth was 8 feet 2 inches, and the length 5 feet 9 inches—showing the justice of our remark, in the inferiority of the fore-quarters, as to girth and expansion.

The shorthorn cattle have been exhibited in a more refined manner than in the show of this year, but never more usefully. The carcases have been much more fattened; but better frames of beef have not often appeared. The prize oxen of Mr. Stratton fall under the denomination of useful rather than of a very refined organization. The parts of the animal are all very conformable, but never reach the highest point of breeding. As useful animals, they may be unrivalled.

Much attention was attracted by a shorthorn ox of nearly six years old, belonging to Sir Harry Verney, Bucks, of which the height averaged 6 feet, and the dead weight was placed at 300 stones of 8lbs. The girth was 9 feet 8 inches, and the length 6½ feet, which, according to the best rules of computation, gives a deficiency of nearly 30 stones below the weight as above stated. The animal had no recommendation except his huge bulk, and mostly in the height. The chief parts were coarse and heavy.

Our attention was very much fixed on the two shorthorn cows, below four years old, which have been already mentioned. The animals stood side by side, and afforded a fair competition, and much ease of comparison. It was by far the most interesting part of the cattle department.

HEREFORD CATTLE.

The first prize, as feeder and breeder, went to the Earl of Radnor, for animals not above three years old. The beast was white-faced, of the new Hereford breed, and fairly symmetrical. The top of the shoulder was narrow, and the points not so well covered as in that breed of cattle. The ribs were very level in the flesh; the flank very good, and standing well out. The thighs were lean, and the posterior width rather deficient. The loins were level, and the flank deep. The level covering of the ribs was the chief recommendation. In all other points, our opinion is, that better specimens were exhibited. The girth was 7 feet 10 inches, and the length 5 feet 4 inches. The temper of this animal seemed very mischievous.

The second prize showed a beast of inferior parts—long, bending horns, drooping rump, narrow twist, as was the whole body. The ribs were very well covered, and the loins level. A height in the back, behind the shoulder, destroyed the straight line; the neck lowered to the root of the horns, which formed a large osseous summit of the head. The beast was certainly very inferior. The girth was 7 feet 8 inches, and the length 5½ feet.

The first prize, above three years old, was awarded to a very superior animal of the Hereford breed, of great width and rotundity of carcase. The shoulder, ribs, and hook-bones were uncommonly level in the covering of flesh, with the back corresponding. The posterior width failed, as is usual with Hereford cattle. The hind-legs hunkled forwards beneath the body, and stood inwardly, almost touching the knees—another unseemly peculiarity of this breed. The flank was good, but failed at the junction with the hip-bone. The girth was 8 feet 7 inches, and the length 5 feet 7 inches.

The second prize was a highly-fattened animal, full in the fore-ribs, and wide over the loins. The fore-shoulder was bare, and high on the top. The opening at the short-ribs wanted covering. The thighs were lean, and the buttocks very protuberant. These deformities were balanced by the fore-ribs, which were very superior. The girth was 9 feet 1 inch, and the length 5½ feet.

HEREFORD COWS,

Not over four years old, in the first prize showed an animal of very excellent quality, and of a very true feminine appearance. The mottled face showed the old Hereford breed. The loin was very extraordinary, as also the rump and flank. The posterior width was good, and the legs straight in the upstanding. The stature was low, but the carcase very handsome. The girth was 7 feet 8 inches, and the length 5 feet 4 inches.

The second prize went to a white-faced cow, of very fine loin and flank; the fore-quarter was light, and the hind parts very hunkled. The carcase was an indifferent specimen. The girth was 7ft. 2in., and the length 5ft. 4in.

The first prize for cows above four years old was given to a very superior animal, of much compass and symmetry. The carcase was very uncommonly even in the fleshy

covering; the hind-quarters sufficiently wide; the shoulder obliqued with much covering. The back was level, and the loin wide. The fatness was very middling, but the even fleshiness not surpassed in the show. The girth was 7ft. 8in., and the length 5ft. 4in.

The second prize had no competition.

The Hereford cattle have certainly been very much better exhibited than in the show of this year, and more especially the oxen of that breed. The first prize of the oldest animals was a fair specimen; the others were certainly inferior. The girths fall much behind the short-horned animals—the lengths are more approximated. The unsuccessful animals were a much better exhibition, comparatively, than the prize beasts, which did not rank high, with the exception of the first prize of above three years old; and that animal only sustained in a fair manner the reputation of the Hereford breed.

Among Hereford oxen above three years old, his Royal Highness Prince Albert exhibited an ox of great merit. The girth was 9ft. 4in., and the length 5½ft.—dimensions equal to many of the shorthorn beasts, and exceeding the prize animals. The carcase was very primely fattened, but lumpy rather than even in the covering of flesh, and tending to secretions on particular places. The body wanted length to form a handsome carcase, for however desirable and essential a deep girth may be, a very considerable degree of cylindrical length is required to constitute a handsome ox; and this requisite holds in every animal life—in horses, cattle, sheep, pigs, and even in poultry. The now mentioned beast was high in the shoulder, but a most respectable animal.

DEVON CATTLE.

The chief prize went to the Earl of Leicester, for a most handsome ox under three years old, of the most symmetrical breed of all British cattle. The appearance was neat and feminine almost beyond example, and the carcase was fleshy in a uniform covering. The twist was narrow, as happens with the Devon cattle. The Holkham cattle are well known by their very compact symmetry and general contour. The girth was 7ft., and the length 4½ft.

The second prize showed a bullock with a curly coat of hair, and of much symmetry, as is known of Mr. Turner's cattle. The shoulder was exquisitely fine, round on the top, and well covered with flesh on every part. The flank was very good. The girth was 7ft., and the length 4½ft.

Above three years, the Devon cattle in the first prize showed an ox from Dorsetshire, of the larger kind, and of most superior quality. The wavy coat of hair was most pleasing, and the silky gloss much enhanced the appearance. The whole carcase was a great improvement of the Devon cattle, in the much-required increase of bulk, in the length of body, and the posterior width. The horn was not disproportioned, but still too long, and very much wants reduction. The girth exceeded many of the Herefords, even the prize animals. This animal was much and deservedly noticed. The girth was 8ft. 9in., and the length was 5ft. 2in.

The second prize went to the Earl of Leicester for an ox of much merit—a curly coat of hair, and a lengthy carcase of uniform fleshy covering. The narrowness behind very much subtracted from the general merits. The girth was 7ft. 3in., and the length 5ft. 4in.

DEVON HEIFERS,

Not exceeding four years old, showed in the first prize a most symmetrical animal, of small size, but a very beautifully fleshed carcase. The back very straight; ribs full; loin wide; and all bones wholly covered. The posterior width very fair, and the flank full. A more complete little carcase has seldom been brought to view. The girth was 7ft. 4in., and the length 5ft. 2in.

Second prize not given.

For Devon cows, above four years old, the Earl of Leicester obtained the first prize and silver medal for a cow of the small size of the Holkham breed, but of the well-known symmetry. The carcase was uniformly fleshy, and measured in girth 7ft. 4in.; and in length 4½ ft.

The second prize went to a larger cow belonging to Lord Portman, and of much merit; in girth 8ft. 3in., and in length 5ft. 2in. This cow pleased our judgment very much—of a good size, and retaining the symmetry of Devon cattle. The animal stood alongside the first prize, and appeared to be the most useful and appreciable animal with which general opinion agreed.

The Devon cattle were well exhibited, though wanting the curly coat of hair and thick gelatinous skin in the stock of Mr. Quartly, which never ceased to attract our attention, and always obtained a superior notice. The Holkham animals are too small, too silky in the skin, and too thin in the hairy covering. The symmetry is unquestionable. Mr. Turner's stock is better, but Mr. Quartly's exceeds them; and our opinion prefers to all the prize ox of this year, above 3 years old. The dimensions give a weight of from 90 to 100 imperial stones, which is almost sufficient for any fattened purposes. Lord Portman's cow stands on the same grounds of commendation, reaching a weight of 80 to 90 imperial stones—a very large departure from the general weight of Devon cows. Our opinion has long maintained that the Devon cattle being enlarged in the size, widened in the twist, with upright buttocks, and the horn reduced to one-third of the present length, and retaining the symmetry now possessed, would exhibit a *ne plus ultra* specimen of animal organization in the genus of cattle. The two animals now mentioned are a large advance in that direction, and, if followed, may reach the end desired.

CROSS BRED

classes of cattle did not possess any very particular merit. The Scotch cattle were badly exhibited—particularly the Argyle breed. The two prizes in polled Galloways were poor specimens—down in the back (a great fault), low in the paunch, narrow in the twist, and high on the rump. A pure Norfolk beast was very commendable. Two good specimens were shown of longhorn cows or heifers, one of which obtained a prize.

The length of the body of this breed is the chief and almost only recommendation; the lightness of the fore-quarter sinks the animals into neglect. But the breed may claim a class for the name it inherits. The long body is more cylindrical than any other cattle, but light, and wanting in girth. A prize was given to a cross heifer—Durham and Galloway Scot—a most handsome animal, polled, and beautifully variegated in colour, 3 years and 8 months old. There was merely shown a reiteration of the amalgamation of animal qualities which has produced the present shorthorn breed of cattle.

THE EXTRA STOCK

showed a very superior shorthorn cow, which won the silver medal, belonging to Mr. Barnard. The colour was most fashionable, and the carcase handsome almost beyond a fair equality. Few such specimens appear of the shorthorns.

SHEEP

were exhibited this year in a very superior manner in every class. The Leicester sheep of Mr. Foljambe were superb animals, of fine bone, and suitable action; lengthy in the carcase, and of a proper height from the ground. The wool might be rather open in the pile. Two first prizes, with silver medals to the breeder, obtained the gold medal for Mr. Foljambe. No objection could be made; though, for useful breeding stock, our opinion would prefer the animals of the third prize of long-wooled sheep, as more lively and active, and also finer in the head. The size was sufficient, and the wool was closer in the coat than of the higher prizes. Long-wooled sheep were never better exhibited.

SOUTHDOWN SHEEP

The chief prizes, and the gold medal, were in the hands of the Duke of Richmond. His Grace's perseverance has overcome all obstacles, and reached the summit of excellence. Mr. Rigden bore hard upon the first prize for one-year-old sheep. The pens were adjacent, and showed a fine competition. In the class of aged Downs, the sheep of Earl Radnor were highly respectable in the second prize.

COTSWOLD SHEEP

Were largely exhibited, and in a very superior manner. This breed creeps yearly into notice, and into public estimation. The pure-bred prize animals were excellent specimens.

The cross breeds and extra stock showed several very good animals; the best, as usual, in the Leicester and Southdown, which cross produces a truly excellent animal, handsome and fleshy, with a wool of first-rate quality and quantity. No sheep is provided with better qualities.

PIGS

Had a large exhibition in every class, except in the large breeds, which are declining. Only one very large animal was exhibited, which had no recommendation except "monstrosity." The small breeds and middle bulks were very superior.

His Royal Highness Prince Albert was the chief winner of prizes in young and aged pigs, and also of the

gold medal. The younger pigs are unexceptionable ; the older animals are very low and heavy, unwieldy, with a head that is very disproportionately small and unseemly. The pigs belonging to Mr. Marjoribanks are more active ; and our opinion gives the preference to the stock of Mr. Crockford's, Stanmore, possessing more length of body, higher on the legs, a better sized head, and a better coat of hair. The pig is naturally a drowsy, sluggish, and stupid animal, and the fattening organization should not be reduced beneath some degree of sprightly vigour, in order to promote the action of the digestive and functional organs. Lateral extension is a great essential in a pig, but it must not overbalance the length, and produce an unwieldy sideling bulk. A breed of swine is preferable, which in the young condition affords small fresh pork, and in the advanced state yields hams and bacon of sufficient size. This breed would dispense with small varieties, which suit only one purpose, and also the large breeds that yield bacon only.

The success of his Royal Highness Prince Albert in the breeding of pigs, and his complete failure this year of the four oxen exhibited in Devons and Herefords, suggests the expediency or necessity of breeding, as well as feeding the cattle, when the same success might attend the performance. There is much more merit in breeding cattle than in feeding them, the latter being altogether mechanical, and the former a very high exertion of intellectual judgment and calculation. There is little merit, comparatively, in refining the organization of swine, as the hog is very susceptible of variations, and an almost universal cosmopolite. The frequent bearing of young, shows the effects of sexual intercourse much sooner than the yearly productions of cattle and sheep. Prizes for any animals might be confined to the breeders "only."

IMPLEMENTS

Were shown in the usual multitudinous variety—corn drills by Garrett, drop drills by Hornby, and ploughs by Busby and Howard ; chaff cutters by Wedlake, with the well-known very excellent hay tedding machine. The reaping machines appeared only to show the inferiority to Bell's, which exceeds the reimportation from America. Ploughs with mould-boards burnished, as for a furnishing ironmonger's show room, and provided with wheels and skim coulters and many fastening screws, are encumbrances well suited for indolent ploughmen, spending time at the ends of the field in making the adjustments of the many parts. Simplicity, in our opinion, is the grand point in machinery of every kind.

Among turnip-slicers we admired the simple construction by Mr. Healy, of Oxford-street. The quarter of a circle is provided with two knives facing in opposite directions, which being driven by a handle with a crank rod, makes a rocking motion, cutting a slice in the outward motion, and another in returning. It is much the simplest thing of the kind, at the same time strong and efficient.

Draining-tile making machines decrease in number ; we highly approved the barn fanners by Dray, which gained the prize medal at the Exhibition. It is very

easily driven, and uniform and steady in the motion. That machinist had a splendid stall of very useful tools, both large and small in the shape and application.

Mr. Cogan showed the usual very large assortment of glass articles, most useful in milk dishes, beehives, and hand churns. The syphon, which draws the milk from the basin and leaving the cream, is an implement for every dairy.

Diagonal iron harrows are always shown largely. Except on clay land fallows, iron harrows are too heavy—sink into the soil, and make very unseemly trailing marks. The diagonal form confers no advantage over the square shape drawn by the corner, as in the common way. Draining ploughs fail in the exhibition as formerly ; the impossible application becomes apparent.

ROOTS AND SEEDS

were exhibited in the usual quality and abundance by Messrs. Gibbs, of Half Moon-street, who had an excellent collection of turnips and beet-root, and Mr. Gibbs, of Down-street, Piccadilly. Mr. Skirving, of Liverpool, showed the large-sized roots of Swede turnips, which are now well known.

The Royal Dublin Society exhibited a large collection of roots, turnips, parsnips, beet, and cabbages, that have never been exceeded by any show in Britain. The size was not very extraordinary, but very amply sufficient ; a much better quality was possessed in being strictly useful, and adapted to the special purposes. No monstrosity appeared of any kind, but most useful products existing in the superlative degree. The specimens of white drumhead cabbages, in the compact shape and most proper bulk, defied any superior competition. Ireland merely wants the application of the common means.

Public opinion having now, by the removal of Smithfield Market, determined the principle that no large public congregations, as markets and exhibitions, should be held in the thronged streets of large towns, it follows that the place of exhibition for the show of fat cattle be removed outside the crowded parts of the metropolis, and held in some open ground. It might well suit the purpose to have a place for the show in the market ground now being fitted in Copenhagen Fields, and roofed with glass for protection. The place could be used for common market purposes at other times, as the fat cattle require only four days in the year. The cost would not be large, and the convenience would be immense. Railways from every terminus around the metropolis will speedily be erected to lead to the new market ; thus affording a continued conveyance to all traffic upon the road of iron. This arrangement will be a very large convenience in forwarding the fattened animals, which dislike disturbance and annoyance.

Our report closes with a notice of Mr. Davis, artist, Chelsea, who is found at every show in making most correct and striking likenesses of the prize animals. He is largely employed, as his productions are allowed the highest grade in the portraiture of animals.

ANNUAL DINNER.

The annual dinner of the Smithfield Cattle Club took place at Freemasons' Tavern on Wednesday, Dec. 7, and was attended by upwards of 100 of the leading agriculturists of the kingdom. His Grace the Duke of Richmond presided, supported by Lord Berners and Mr. P. Pusey; and amongst the company we observed Lord Portman, Admiral Saumarez, Mr. Barrow, M.P., Sir J. V. Shelley, M.P., Mr. H. Brandreth, Mr. C. Barnett, Mr. Raymond Barker, Mr. Milward, Mr. H. Hall, Mr. C. Hall, Mr. R. W. Baker, Professor Simonds, Mr. Brandreth Gibbs (hon. secretary), Mr. Hudson of Castleacre, Mr. Loft, Mr. T. Davy, Mr. L. Willmore, Mr. J. Clayden, Mr. S. Druce, Mr. G. Turner, Mr. Chamberlain, Mr. Shearer, Mr. Hitchman, Mr. Moore, Mr. Wilson, Mr. Fisher Hobbs, Mr. G. P. Tuxford, Mr. Mechi, Mr. Stratton, and Mr. Rigden.

Her Majesty's health having been drunk with all the honours,

The Duke of Richmond proposed, as the next toast, "The Health of Prince Albert, Albert Prince of Wales, and the rest of the Royal Family." He gave the health of Prince Albert on this occasion with the greatest pleasure, because he thought his Royal Highness, by being a member of the Smithfield Club, and constantly exhibiting his stock at its shows, did a great deal in leading the way to make agriculture fashionable (cheers). He was happy to find that Prince Albert had this year been the winner of one of the gold medals, and that in a class—the pigs—which he believed had never been exceeded in the Smithfield show-yard (Hear, hear). With regard to the Prince of Wales, it was his earnest desire that his Royal Highness, educated under the eye of his parents, might follow their example, in entertaining a kindly feeling towards men of all countries, and in devotion to the land of his birth (Hear, hear). It was a matter of great importance, not perhaps to one so old as he (the Duke of Richmond) was, but to those who might hereafter be under the rule of the Prince of Wales, that his Royal Highness should be educated as an English gentleman, in sound principles, and with the desire honestly to do his duty in that station which, when he did succeed to it, he (the Duke of Richmond) hoped he would fulfil for the benefit of all classes (cheers).

The toast was drunk with loud cheers.

The Duke of RICHMOND would now give "Success to the Smithfield Cattle Club" (cheers). He believed that every individual then present was aware that this society had been established for the purpose of improving the breed of cattle, sheep, and pigs—that its object was not to produce the monster animal that they had seen from the county of Buckingham, but to bring to the show animals which had reached an early maturity, and were wholesome and cheap food for the consumers (Hear, hear). He was authorized in stating, on behalf of the judges, that they considered the show of this year better than an average one; that the sheep and pig classes had seldom, if ever, been exceeded; and that the show, as a whole, was highly creditable to the exhibitors (cheers). It was a very numerous one, too,

as they all knew, and contained many most superior animals (Hear, hear). Only a few years since, it was predicted that the Smithfield Club would no longer continue to have such splendid shows in the metropolis, because Birmingham and other places were treading on its heels, and that the attempt to compete with them would be utterly useless. Now he sincerely hoped there would never be any rivalry between the Smithfield Club, that at Birmingham, the great one in Yorkshire, and others in different parts of the country, except the honest emulation to do the best they could for the agricultural interest and for the general body of consumers at large (Hear, hear). For it appeared to him that the field was wide enough for the operations of many more societies than those now in existence. But if these societies were flourishing, to whom, he asked, was the credit due? Surely to the energies of the Smithfield Club. It was they who set the example, which had been followed so extensively in every part of the country, and which he thought was an amply sufficient answer to those who asserted that such associations were of no service to the country (cheers). If they had been of no service, was it reasonable to suppose that they would be found in every county in England? No (cheers). He contended, therefore, that they had been of service; and he wished them all the utmost prosperity (renewed cheers). Moreover, they could not have failed to observe the immense throng of persons who had visited the show-yard yesterday and to-day. And was it not something in favour of the Smithfield Club that, whilst it was promoting that interest which was paramount to all others, the interest of agriculture, it also afforded pleasure to vast numbers of their fellow-citizens, who never saw a sheep elsewhere than Smithfield Market (Hear, hear, and laughter). He was happy to be able to add that in the matter of finance, which usually had a great deal to do with the prosperity of most institutions, there was no fear of the members of the Club being called upon to contribute any additional taxation. There was a large surplus in the hands of their chancellor of the exchequer; and at the present moment the funds were in such a position that they could pay all demands, and still have a clear year's income in reserve to meet the liabilities of next year (cheers). He would detain them no further, but give, in a bumper, "Prosperity to the Smithfield Cattle Club."

The toast was drunk with three times three.

Mr. BRANDRETH GIBBS, the Hon. Secretary, then read the award of prizes; after which "The health of the winners of gold medals" was proposed.

The Duke of RICHMOND (the winner of the gold medal for the best pen of short-woolled sheep), in returning thanks for the compliment done him, said he had always endeavoured to do his utmost to advance the weal of the empire at large, and he thought that in promoting the agricultural interest he was doing by far the best thing to promote the interest of all (cheers). He had been a member of the club for many years, had often exhibited his stock at its shows, and formerly returned thanks for the unsuccessful competitors, and

occasionally for himself as the winner of second prizes, but only once before as having cleared the field in all the classes in which he had competed. Now, he did not think it was owing alone to his own judgment, and he thought it might be instructive to young flockmasters and farmers of the country if he told them that the great reason why they did not all improve was, that it took a long time to convince them that their own flocks needed improvement (Hear, hear). Whenever he attended a show he carefully examined the animals that competed with him. Sometimes he might have considered that he ought to have been in a prouder position; but never, either in public or in private, had he stated that he ought to win (Hear, hear). And why? Because he felt it was his duty to bow to the decision of the judges (cheers). Besides, he had invariably found upon those occasions a very good reason why the judges deemed his animals not quite so perfect as he himself had fondly imagined them to be. And the moment he made that discovery, he at once said to his agent and shepherd, who were the prime ministers of those who did not always reside upon their farms, "You see the reason why we are beaten. We must do our best to correct these faults, and before long we shall get in another and a better position" (Hear, hear). That had happened in the present instance (Hear, hear). His friend, Mr. Rigden, than whom a better or more straightforward Sussex farmer did not exist, stated to him this evening that he hoped next year to change places with him (the Duke of Richmond). Well, he felt obliged to his friend for that, because it implied that he (the Duke of Richmond) would be at least second best; but he begged to tell Mr. Rigden that if beaten next year, it should not be because he wanted perseverance, or did not exert himself. Mr. Rigden might depend upon it that he would have some little difficulty in getting three sheep to beat three of his (the Duke of Richmond's), because, although one of Mr. Rigden's young sheep was nearly as good an animal as ever he saw, yet that was not enough, for the remaining two were quite the other way; and if Mr. Rigden could not muster three as good, he could not expect to win. The exhibitor who was second to him (the Duke of Richmond) on this occasion was Lord Radnor, whom he had known and highly respected for very many years. And he would now warn Mr. Rigden and other flockmasters that Lord Radnor was rather a dangerous customer to deal with (Hear, and laughter), and that they must take exceeding good care, or in the dispute between the two Sussex men as to which was to be first or second, Lord Radnor would come in and beat them both—a circumstance which, he was sure, Mr. Rigden would not like (cheers and laughter). Care and perseverance were as necessary in the breeding of sheep as in other pursuits; and it was just possible that all were too apt to find fault with the judges when they would be much more profitably employed in examining and comparing the animals, and then correcting the mistakes of their own flocks (Hear). The noble duke concluded by giving "The Health of the Unsuccessful Competitors."

Sir JOHN SHELLEY admitted that he had always

striven to avoid false shame; and in such a superb show of sheep as there was in the yard on this occasion he did not know that there was anything in his position as an unsuccessful competitor to be ashamed of (cheers). He could only promise, in his own name and in the name of the other unsuccessful competitors, that they would do their best to reverse their position, if they were spared to another year (cheers).

The CHAIRMAN then proposed "The Vice-Presidents and Trustees of the Club."

Lord PORTMAN, in reply to the toast of "The Trustees," observed that the objects of the Smithfield Club were to support not so much the beginning as the end of farming, by bringing the best of food to market at the cheapest rate, to pay at the same time the grazier and the butcher. He, however, must say that he regretted to see that the butchers of the metropolis were not so active as they ought to be, in supporting that which was so much to their own benefit; and he trusted his honourable friend, Sir John Shelley, who was a vice-president of the Butchers' Charitable Association, would stir them up in this respect (laughter).

Lord BERNERS, in reply for the toast of "The Vice-Presidents," alluded to the advantages which the Royal Agricultural Society of England were to the graziers and breeders, and related a case of his own, where he was continually losing valuable animals by disease, until, under a rule of the Royal Agricultural Society of England, he made application for a professor from the Royal Veterinary College, which they supplied gratuitously, and under the advice of Professor Simonds thirty-nine valuable beasts were saved. It should be known to all that, upon application to the Royal Agricultural Society, they gave this service gratuitously (cheers).

The CHAIRMAN proposed "The Royal Agricultural Society of England, coupled with the health of Mr. Philip Pusey, its President" (loud cheers).

Mr. PUSEY returned thanks, and said that the last few years had been an anxious time for all agriculturists, and they might believe him when he said he shared in their anxiety. He trusted, however, that the Royal Agricultural Society, which this year he had the honour to represent, and certainly it was a high honour for a private individual like himself to be the representative of five thousand of the most intelligent farmers of England, had contributed in some degree to relieve their anxiety; and now that they had in a measure weathered the storm, he hoped that it would be conceded that the Royal Agricultural Society had so far conferred a national benefit as to have helped a very important class of Englishmen to get through their difficulties—a class of Englishmen who could never experience suffering without the whole body politic suffering along with them (Hear, hear). All that the Royal Agricultural Society had done depended, of course, upon the support it had received from the tenant-farmers, and he was happy to say that he observed no symptom of a withdrawal of confidence on their part (cheers). Indeed, some such institution as the Royal Agricultural Society was necessary to them from the very nature of their pursuits, and because they were scattered over the

country from Berwick to the Land's End, and the cliffs of Dover. Isolated in a great degree, they could not live together like merchants or manufacturers, who the moment any improvement took place, either in the art of dyeing or machinery, or anything else that concerned them, were at once made acquainted with it, and were thus enabled to keep pace with improvements in science and the spirit of the age. Until the Royal Agricultural Society was called into existence, very few persons had the least idea of many improvements which had been long practised in various counties of England, and the knowledge of which had up to that time been entirely confined to those counties. Next year the society intended visiting a county which bore upon its face the stamp of all the most recent improvements, and he felt sure the meeting would be a successful one (Hear, hear). They had heard of the drainage of Holland. Well, in the county of Lincoln there were upwards of 600,000 acres of land which had been recovered from the sea by the gigantic system of drainage adopted there. And on the occasion of their meeting next July in the ancient city of Lincoln, they would have an opportunity of seeing not only the exhibition of stock and agricultural implements, but of making themselves acquainted with palpable facts, a result of the energies of the men of Lincolnshire (cheers).

"The Health of the Stewards," "The Judges," "The Hon. Secretary," and some other toasts followed, the list concluding with that of "The Labourer," proposed in a speech of much feeling and ability by the noble President. We only regret that the many demands on our space prevent our giving it in full.

LIST OF PRIZES.

DEVONS.

Class 1.—STEERS NOT EXCEEDING 3 YEARS OLD: 1st prize £25 and silver medal as the breeder, the Earl of Leicester, of Holkham-hall, near Norwich; 2nd prize £10, Mr. George Turner, of Barton, near Exeter—*purchased by Mr. Curtis, of Aduer.*

Class 2.—STEERS OR OXEN ABOVE 3 YEARS OLD: 1st prize £25, Mr. John Coate, of Hammoon, near Blandford—*purchased by Mr. Chas. Frampton, of Wimborne, Dorset*; silver medal as the breeder, Mr. Edward Bond, of Heathfield, near Taunton; 2nd prize £10, the Earl of Leicester, of Holkham-hall, Norfolk—*purchased by Mr. E. V. Collingwood, of Westbourne-place, Paddington.*

Class 3.—HEIFERS NOT EXCEEDING 3 YEARS OLD: 1st prize £15, Mr. Samuel Farthing, of Stovey-court, near Bridgewater—*purchased by Mr. J. M. Stedwell, of Twickenham*; silver medal as the breeder, Mr. John K. Farthing, of Nether Stovey, near Bridgewater.

Class 4.—COWS ABOVE 4 YEARS OLD: 1st prize £20 and silver medal as the breeder, the Earl of Leicester; 2nd prize £10, Lord Portman, of Bryanstone, near Blandford—*purchased by Mr. R. Doring, of Blandford, Dorset.*

HEREFORDS.

Class 5.—STEERS NOT EXCEEDING 3 YEARS OLD: 1st prize £25 and silver medal as the breeder, the Earl of Radnor, of Coleshill-house, Berks—*purchased by Mr. Henry Edwards, of Tonbridge Wells*; 2nd prize £10, Mr. Joseph Phillips, of Ardington, near Wantage—*purchased by Mr. Cooping, of Habbington.*

Class 6.—STEERS OR OXEN ABOVE 3 YEARS OLD: 1st prize £25, Mr. Isaac Niblett, of Conygre Farm, Filton, near Bristol—*purchased by Mr. J. Bancroft, of Great Grimby*; silver medal as the breeder, Mr. T. L. Meire, of Cound Harbour, Shrewsbury; 2nd prize £10, Mr. John Phillips, of Ardington, near Wantage—*purchased by Mr. W. Smith, of Exeter.*

Class 7.—HEIFERS NOT EXCEEDING 4 YEARS OLD: 1st prize £15, Mr. Robert Beman, of Moreton-in-Marsh, Gloucester; silver medal as the breeder, Mr. Joseph Bayzand, of Kingley, near Alcester; 2nd prize £5, Mr. Joseph Phillips, of Ardington, near Wantage—*purchased by Mr. J. Kingham, of Whittingham.*

Class 8.—COWS ABOVE 4 YEARS OLD: 1st prize £20, Mr. W. S. Cartwright, of Stow-hall, Newport, Monmouth; silver medal as the breeder, Mr. Henry Collins, of Newport, Monmouth.

SHORTHORNS.

Class 9.—STEERS NOT EXCEEDING 3 YEARS OLD: 1st prize 25*l.*, and silver medal as the breeder, Mr. Richard Stratton, of Broad Hinton, near Swindon; 2nd prize 10*l.*, Mr. Robert Lynn, of Stroxtun, near Grantham—*purchased by Mr. H. F. Hill, jun., of Harrow-on-the-Hill.*

Class 10.—STEERS OR OXEN ABOVE 3 YEARS OLD: 1st prize 25*l.*, and silver medal as the breeder, Mr. Richard Stratton, of Broad Hinton, near Swindon; 2nd prize 10*l.*, Mr. Edward Frost, of West Wrating-hall, Linton, Cambridge—*purchased by Mr. Ferris, of Bath.*

Class 11.—HEIFERS NOT EXCEEDING 4 YEARS OLD: 1st prize 15*l.*, Mr. Joseph Phillips, of Ardington, near Wantage; silver medal as the breeder, Mr. Thomas Garne, of Broadmore, near Northleach; 2nd prize 5*l.*, Mr. Henry Ambler, of Watkinson-hall, near Halifax.

Class 12.—COWS ABOVE 4 YEARS OLD: 1st prize 20*l.*, Mr. Henry Smith, of the Grove, Cropwell Butler, near Bingham, Notts; silver medal as the breeder, Mr. William Smith, of West Rasen; 2nd prize 10*l.*, Mr. Henry Roberts, of Paxford, near Bloxley, Worcester.

SCOTCH, WELSH, OR IRISH.

Class 13.—STEERS OF ANY AGE: The prize 10*l.*, the Rev. J. Arkwright, of Mark-hall, Harlow, Essex—*purchased by Mr. John Mann, of Croydon.*

Class 14.—HEIFERS OR COWS OF ANY AGE: The prize 5*l.*, the Earl of Leicester—*purchased by Mr. H. Speed, of Queen's-road, Chelsea.*

OTHER PURE BREEDS.

Class 15.—STEERS OR OXEN, ANY AGE: The prize 10*l.*, Mr. J. H. Gurney, of Easton, near Norwich—*purchased by Mr. Collingwood, of Lamb's Conduit-street*; silver medal as the breeder, Mr. G. S. Kett, of Brooke, Norfolk.

Class 16.—HEIFERS OR COWS, ANY AGE: The prize 10*l.*, Mr. James Caines, of Cheselborne, near Dorchester—*purchased by Mr. Henry Kellaway, of Dorchester*; silver medal as the breeder, Mr. James Davies, of Melcombe Horsey, near Dorchester.

CROSS OR MIXED BREED.

Class 17.—STEERS NOT EXCEEDING 3 YEARS OLD: The prize 15*l.*, and silver medal as the breeder, Mr. William Hever, of Sevenhampton, near Highworth—*purchased by Mr. R. Brooks, of 14, Hampstead-road.*

Class 18.—STEERS OR OXEN ABOVE 3 YEARS OLD: The prize 15*l.*, the Earl of Darnley, of Cobham-hall, Gravesend; silver medal as the breeder, Mr. John Rogers, of Leddicott, near Leominster.

Class 19.—HEIFERS OR COWS NOT EXCEEDING 4 YEARS OLD: The prize 10*l.*, Mr. W. M. Farrer, of Kempstone-lodge, Swaffham—*purchased by Mr. Pethurbridge, of Hastings-street, Burton Crescent*; silver medal as the breeder, Mr. Christopher Twiss, of Swardeston-hall, Norwich.

LONG-WOOLLED SHEEP.

Class 20.—1st prize £20 and silver medal as the breeder, Mr. G. S. Foljambe, of Osberton-hall, Worksop, Notts—*purchased by Mr. T. Baker, of Old Kent-road*; 2nd prize £10, Mr. J. Mudford, of Hoe-fields, Thurlaston, near Hinchley—*purchased by Mr. H. Barclay, of 96, Great Tichfield-street, Portland-place*; 3rd prize £5, Mr. R. F. Hall, of Hesley-hall, near Bawtry—*purchased by Mr. R. Phillips, of Somers-town.*

Class 21.—1st prize £20 and silver medal as the breeder, Mr. G. S. Foljambe, of Osberton-hall, near Worksop, Notts—*purchased by Mr. G. Bridges, of East-street, Manchester-square*; 2nd prize £10, the Marquis of Exeter, of Burghley-park, Stamford; 3rd prize £5, Mr. R. L. Bradshaw, of Burley-on-the-hill, Oakham—*purchased by Mr. Townsend, York-road, Lambeth.*

LONG-WOOLLED (NOT LEICESTERS).

Class 22.—1st prize £10 and silver medal as the breeder,

Mr. W. Slatter, of Stratton, near Cirencester—*purchased by Isaac Polhecarry, Esq., of the Grove-place Asylum, Southampton.*

CROSS-BRED SHEEP.

Class 23.—1st prize £10 and silver medal as the breeder, Mr. S. Druce, of Eynsham, near Oxford—*purchased by Mr. Holmes, of Fore-street, Cripplegate*; 2nd prize £5, Mr. John Hitchman, of Little Milton, near Wheatley, Oxon—*purchased by Mr. J. Emery, of Leyton, Essex.*

Class 24.—The prize £10 and silver medal as the breeder, Lord Walsingham, of Merton-hall, Thetford—*purchased by Mr. Matlock, of Marsham-street, Westminster.*

SHORT-WOOLLED SHEEP.

Class 25.—1st prize £20 and silver medal as the breeder, the Duke of Richmond, of Goodwood, near Chichester—*purchased by Mr. Thos. King, of Paddington*; 2nd prize £10, Mr. William Rigden, of Hove, near Brighton—*purchased by Mr. Davey, of Brighton.*

Class 26.—The prize £10 and silver medal as the breeder, the Duke of Richmond—*purchased by Mr. Henry Edwards, of Tonbridge Wells.*

Class 27.—1st prize £20 and silver medal as the breeder, the Duke of Richmond—*purchased by Mr. King, Mary-le-bone*; 2nd prize £10, the Earl of Radnor—*purchased by Messrs. J. and G. Stevens, of Oxford.*

SHORT-WOOLLED (NOT SOUTH-DOWNS).

Class 28.—The prize 10l. and silver medal as the breeder, Mr. Stephen King, of Old Hayward Farm, Hungerford—*purchased by Mr. E. Orris, De Beauvoir-square, Kingsland.*

PIGS.

Class 29.—1st prize 10l. and silver medal as the breeder, Mr. John Coate, of Hammoan, near Blandford—*purchased by Mr. Gorton, 8, Tichborne-street, Piccadilly*; 2d prize 5l., His Royal Highness Prince Albert—*purchased by Mr. T. Wall, Jermyn-street.*

Class 30.—1st prize 10l. and silver medal as the breeder, His Royal Highness Prince Albert—*purchased by Mr. T. Wall, Jermyn-street*; 2d prize 5l., Mr. John Coate, of Hammoan, near Blandford—*purchased by Mr. Jno. Hagnier, 125, High-street, Poplar.*

Class 31.—1st prize 10l. and silver medal as the breeder, Mr. John Coate, of Hammoan, near Blandford—*purchased by Mr. D. Hedges, 2, Sussex-terrace, High-street, Notting-hill*; 2d prize 5l., Mr. E. L. Betts, of Preston-hall, near Maidstone—*purchased by Mr. Hagniers, St. George's-street, St. George's East.*

GOLD MEDALS.

Gold medal for the best steer or ox in classes 1, 2, 5, 6, 9, 10, 15, 17, or 18, Mr. Richard Stratton, of Broad Hinton, near Swindon.

Gold medal for the best heifer or cow in classes 3, 4, 7, 8, 11, 12, 16, or 19, Mr. Henry Smith, of the Grove, Cropwell Butler, near Binsham, Notts.

Gold medal for the best pen of long-woolled sheep in classes

20, 21, or 22, Mr. G. S. Foljambe, of Osberton-hall, Worksop, Notts.

Gold medal for the best pen of short-woolled sheep in classes 25, 26, or 28, the Duke of Richmond.

Gold medal for the best pen of pigs in classes 29, 30, or 31, His Royal Highness Prince Albert.

EXTRA STOCK.

Silver medal for the best beast, Mr. Charles Barnett, of Stratton-park, Biggleswade, Beds.

Silver medal for the best long-woolled sheep, Lord Berners—*purchased by Mr. Colebrook, of 1, Prad-street, Paddington.*

Silver medal for the best short-woolled sheep, the Duke of Richmond—*purchased by Mr. T. King, Paddington-street.*

Silver medal for the best cross-bred sheep, Mr. John Hitchman, of Little Milton, near Wheatley—*purchased by R. Colegate, of Great Bell-alley, Moorgate-street.*

Silver medal for the best pig, Mr. W. J. Sadler, of Bentham Purton, near Swindon—*purchased by Mr. Ponting, of Stroud, Gloucestershire.*

COMMENDATIONS.

HIGHLY COMMENDED.

Mr. Joseph Phillip's Hereford steer.

Mr. Isaac Niblett's shorthorn cow.

Mr. Charles Howard's cross-bred wethers—*purchased by W. Hawkins, of Harrow-road, Paddington.*

Mr. James Fletcher, jun.'s, cross-bred wethers—*purchased by Mr. Thos. Cook, Clapham-road.*

Mr. Charles Howard's cross-bred sheep—*purchased by Mr. H. Morris, of 1, Queen's-road East, Chelsea.*

Lord Berners' cross-bred sheep.

Mr. John William's Southdown wethers.

Mr. Wm. Rigden's Southdown wethers—*purchased by Mr. Davey, of Brighton.*

Mr. Wm. King's west country down wethers—*purchased by Mr. H. Walling, 21, Marchmont-street, Brunswick-square.*

Mr. John William's Southdown sheep.

Mr. George Sexton's Southdown sheep.

Mr. W. C. Cartwright's improved Middlesex pigs—*purchased by Mr. R. Bonny, Camberwell-gate.*

Mr. Stewart Majoribanks' Suffolk and Yorkshire pigs—*purchased by Mr. Sinkler, of Brompton.*

Mr. Samuel Druce, jun.'s improved Oxfordshire and Essex pigs—*purchased by Mr. Garland, 26, Oxford-market.*

COMMENDED.

Mr. W. M. Gibb's Devon steer.

Mr. J. H. Gurney's Hereford steer.

Mr. Robert Lynn's short-horn ox.

Earl of Leicester's Down and Leicester sheep—*purchased by Mr. C. Adams, of the Hackney-road.*

Mr. E. F. Whittingstall's cross-bred sheep.

Sir R. Throckmorton's pure Sussex wethers—*purchased by Mr. E. Williams, Canal Bridge, Old Kent-road.*

Mr. J. V. William's improved Leicester sheep.

SMITHFIELD GREAT CHRISTMAS CATTLE MARKET.

MONDAY, DEC. 12.

From the fact that the supplies of home-fed Beasts exhibited in this market for several weeks past having been deficient both in number and quality compared with many former corresponding periods, it was pretty generally anticipated that the show here to-day fit for Christmas consumption would be extremely large. That this anticipation has been fulfilled must have been evident to every admirer of fat stock who had an opportunity of minutely examining the various breeds.

Prior to entering into any detail in reference to the trade, we may briefly review the different breeds as they have come under our immediate observation. In the

first place we may observe, that for many years past there has been a spirited contest between the Devon, Hereford, and Short-horned breeders—in other words, each party has used great efforts to increase the numerical strength and weight of the respective breeds. These efforts have been so completely crowned with success on this occasion, that it is somewhat difficult for us to determine to whom the palm of the greatest amount of merit belongs. However, we may intimate that the Devon class—to which our attention was in the first instance directed—exhibited several points of excellence worthy the serious attention of gra-

ziers and breeders in all parts of the country; indeed, we may remark that, collectively, this was one of the most remarkable portions of the exhibition. Let the reader conceive for a moment that there were collected, almost in one spot, 1,300 or 1,400 Devons, chiefly from the westward, all nearly of the same weight and colour—that each animal was worth, on the average, fully £30—and it will at once be perceived that the show was indeed well worthy of a close inspection. With the remark that the Devons were decidedly superior to those brought forward in 1852, we shall now pass to the consideration of the Herefords. This noble breed, which was contributed largely from different localities, kept up its long-established character surprisingly. In the Baker-street Exhibition last week this particular breed showed a slight falling off, but to-day it exceeded all former markets to an important extent. Not a few of the Herefords shown were estimated to weigh from 200 to 230 stones—a weight that would have done credit to the show yard. Thus far, therefore, to-day's supply of Devons and Herefords has proved superior to some past years, and agreeably added to the good things for Christmas consumption in this great metropolis. We now come to the Short-horns. The great attention shown to this description of stock for many years past has materially assisted in bringing it into great repute; indeed, we may venture to observe that there are larger numbers now fed in this country than of any other separate breed. Formerly, the Shorthorns were chiefly bred in Lincolnshire and Leicestershire; but now they have greatly extended themselves into other parts of England, but more particularly into Norfolk, where, apparently, they have displaced the once celebrated Home-breeds from, possibly, their comparative hardiness and aptitude to fatten. Amongst the stock to which we have here particularly alluded were some of the heaviest weights we almost ever remember to have witnessed in an open market. Lincolnshire, Leicestershire, Northamptonshire, Norfolk, and other quarters showed specimens of the breed which excited the admiration and wonder of the visitors, however practical might have been their judgment and experience. With these general remarks, we have now to place the Shorthorns *first* as respects weight. In the second class we assign the Devons, for weight, number, and quality; whilst the Herefords must be placed in the third class for *number*, though they were quite equal in quality to many of the Scots. Be it understood that we have here drawn no invidious comparison, that we have not endeavoured to detract from the merits of any breed, and that our sole object has been to state particulars, which may be found essentially useful in following years. In addition to the breeds above mentioned, there was an average supply of Pembrokehire runts, Sussex oxen, Irish beasts, &c., which attracted great attention.

It would be almost impossible for us to over-estimate the wonderful show of Scots. That it was, collectively, the finest ever witnessed in this or any other market, was evident at a glance. In another portion of our report we have particularly referred to the wonders

brought forward; but we may here remark that very general surprise has been expressed that this extraordinary breed should have been so long neglected by the supporters of the Smithfield Club. We, with others, maintain that the small amount of premiums offered in the Scotch class will eventually have the effect of inducing parties in Scotland wholly to refrain from entering their stock for competition. Thus one of the most interesting portions of the exhibition will be lost, solely from the want of spirit in offering a few additional premiums. We trust, however, that this point will be duly considered ere another year has elapsed.

It is gratifying for us to observe that the stock, both Beasts and Sheep, came to hand free from lameness, notwithstanding the enormous weight and bulk of most of the animals; that our accounts from the leading districts state that the health of most breeds continues good; that very few losses have been of late sustained from disease; and, further, that graziers in general are well satisfied with present prices. Owing to the steady advance in the value of rough fat, butchers have been in a better position to give higher prices for stock. For instance, at the corresponding period in 1851, rough fat was quoted at only 2s. 1d., in 1852 it advanced to 2s. 8d., now it is worth 3s. 1d. per 8 lbs. Thus it will be perceived that the article has risen 1½d. per lb. in two years. Other portions of the offal have advanced considerably, arising from an improved demand.

It is calculated that fully two-thirds of the stock brought forward were by railway conveyance; and we may observe that great credit is due to the various railway companies for the judicious arrangements made by them to meet the great extra demand upon their locomotive powers.

The arrangements on the part of the City authorities for the reception of the stock were as complete as space would admit; but this is the last time—after twenty-five annual visits—that we shall have to report the holding of the Great Market in Smithfield. Of course the influx of visitors from different parts of England, as well as from the continent, was large. During the day the number increased to a most inconvenient extent.

The following are the numbers of Beasts exhibited, and the prices obtained for them, on the great days during the past fourteen years:—

YEAR.	BEASTS SHOWN.	PRICES.			
		s.	d.	s.	d.
1839	..... 5,074	3	4	to 5	0
1840	..... 3,528	4	4	5	8
1841	..... 4,500	3	8	5	0
1842	..... 4,541	3	4	4	8
1843	..... 4,510	2	8	4	4
1844	..... 5,713	4	0	4	6
1845	..... 5,326	3	6	4	8
1846	..... 5,470	3	6	4	6
1847	..... 4,282	4	0	5	8
1848	..... 5,942	3	4	4	8
1849	..... 5,765	3	4	4	6
1850	..... 6,341	3	0	3	10
1851	..... 6,103	2	8	4	2
1852	..... 6,271	2	8	4	0

The imports of foreign stock into London last week were tolerably good. The total supply amounted to

4,795 head, against 4,869 in the corresponding period in 1852; 3,628 in 1851; 5,734 in 1850; 3,720 in 1849; 3,155 in 1848; and 1,913 in 1847.

IMPORTS INTO LONDON LAST WEEK.

From whence.	Beasts.	Sheep.	Calves.	Pigs.
<i>Harlingen</i>	429	1187	9	17
<i>Rotterdam</i>	305	1003	58	7
<i>Hambro'</i>	59	80	—	—
<i>Ostend</i>	—	169	—	—
<i>Amsterdam</i>	71	119	—	—
<i>Nieu Diep</i>	124	1047	11	—
<i>Antwerp</i>	—	50	50	—
<i>Total</i>	988	3655	128	24

By sea, from Ireland, last week, we received 29 Oxen, 16 Calves, and 12 Pigs.

In further analyzing the show of Beasts here this morning, we may observe that Mr. Robert Morgan had a large number of well-made up animals. Those forwarded to that gentleman from Scotland were the property of Mr. W. Milne, Mr. Peter Milne, Mr. H. Knowles, Mr. Cooper, Mr. Thompson, and Messrs. Martin and Livingstone. From Lincolnshire, Mr. Morgan also received some fine stock, the property of Messrs. Goodall, of Market Deeping, Mr. Robert Cooke, Mr. W. Thomas, Mr. Plowright, and Mr. W. Hewson; likewise some wonderful Scots from Norfolk, belonging to Mr. Felton and Mr. Robert Leeds. Mr. Daniel Maidwell showed some extremely fine Galloway Scots, and which were greatly admired. These animals, 32 in number, belonged to Mr. W. M'Comby, of Tillyfour, Aberdeenshire. Her Majesty's butcher, Mr. Banister, of Windsor, purchased twelve of them, from one of which the baron of beef for the royal table will be furnished, as has been the case for some years past, and which has given great satisfaction. On Mr. Dixon's stand we noticed a most excellent collection of Beasts, forwarded chiefly from Norfolk. Some of them were above average weights, even at this period of the year. Mr. Vorley brought forward a large number of very useful Beasts, belonging to Mr. George Phillip, of Keith Hall, Aberdeenshire, and Mr. Cooper, of Hillbera, in the same county. Mr. W. Allenborough,

of Northamptonshire, and various other gentlemen, forwarded some fine stock to the above-named salesman. Mr. Collins had an extremely fine show of Scots; which attracted great attention. Mr. Lamb disposed of several wonderful Scots, from Norfolk, at £45 each. The stock on Mr. Heath's stand was remarkably good.

Amongst the Sheep were 120 very superior half-breds and Gloucesters exhibited by the Messrs. Weall, the property of R. Rowland, Esq., of Creslow, Bucks; 30 very superior Downs from the flock of E. F. Whitting-stall, Esq., of Lanley-Bury, near Watford, and several lots from Henley, Oxon, and St. Alban's, Herts. Mr. W. Starkey had on sale 14 very good half-breds, fed by W. Sharpe, Esq., of Popenhoc Farm, Walsoken, Wisbeach. Mr. Eland showed 80 rare Lincolnshire sheep, the property of Messrs. Everington and Henry, of the Lincolnshire Marshes. Some of them realized £5 each. Mr. Hancock and several other salesmen had some remarkably fine sheep; but we must not forget to notice particularly the remarkable show of Messrs. Giblett and Gurrin; they exhibited six wonderful downs, the property of Mr. John Shelley, and several belonging to Mr. Cardwines, together with Mr. W. Ifewer's Gloucesters. Three of the rams weighed nearly 40 stones each.

STATE OF THE TRADE.

Notwithstanding the large number of beasts in the market, the demand for all breeds, owing to the favourable state of the weather for slaughtering, and the large attendance of butchers, was steady, at an advance on the prices obtained on Monday last of 2d. per 8lbs. A few Scots realized 5s. per 8lbs.; but the top general figure for Beef was 4s. 10d. per 8lbs.

From the northern grazing districts about 2,500 Beasts came to hand. The arrival from the westward amounted to 1,400 head, from Norfolk and other parts of England 750 do., and from Scotland 540 Scots.

The supply of Sheep was seasonably good. For most breeds we had a steady though by no means brisk inquiry, at full quotations. The best old Downs were worth 5s. 2d. per 8lbs.

There was less activity in the Veal trade than on Friday. However, the prices of Monday last were maintained.

About an average business was transacted in Pigs, at last week's currency.

THE BIRMINGHAM CATTLE SHOW.

The promoters of this exhibition must become more and more convinced of the good policy of selecting an open week for the celebration of their proceedings. Much as the increasing success of these meetings is attributable to the excellent management for which they are so remarkable, there is little doubt but the extraordinary advance observable within the last two years, proceeds directly from Birmingham being no longer in antagonism to any other gathering of a similar character. The show profits in every way from so judicious and so necessary an alteration. You see faces, and you find entries, that could not have been there under

former circumstances; while the meeting thus gradually acquires a national, rather than that merely local repute, for the attainment of which it was originally established. The confirmation of the Smithfield Club week must alone make the Midland Counties meeting one of exciting interest.

It is but fair, however, to say that this exhibition has some attractions peculiarly its own. It is not always that the first discoverer reaps the great benefit of that his labours have led to; but at Birmingham—so far, at least—justice still awards the greatest merit to those to whom it is chiefly due. The first to institute an exhibition of poultry, Bir-

mingham yet remains the first. As we take the stranger to Newmarket to show him the best horses, so should we direct him to Birmingham for the best chickens. All other displays of the kind give way before this, as, to carry out our simile, a man would not risk his chance of winning the Two Thousand Guineas, or the Cambridgeshire, by running his horse the week before, for a plate at some meeting of less renown. It was thus the Metropolitan Poultry Show suffered last week, and from the same cause, most probably, will it suffer again. The visitor there might have reasonably concluded the poultry mania was dying out—if anything, a little too fast—the birds sent scarcely reaching that average excellence into which such emulation should subside. At Birmingham, on the other hand, only the week following, never did the rage appear so great—never were so many entries made—never were so many varieties exhibited!—and never did so many spectators swarm the avenues, all more or less qualified to criticise, and anxious to approve. The poultry mania, instead of going off, is, if we are only to believe what we see, but yet more and more extending. It is, though, a mania no longer. It is gradually losing that absurdity of excess, by which it was at one time so strongly characterized. We are getting to the best and most useful breeds of poultry, and we are getting to them at fair and reasonable prices. The best classes, of all the many arranged in Bingley Hall last week, were the Dorking and the Spanish—the farm-yard fowl of this country. Superior as they mostly were, too, a set of four birds might have been had, almost generally, for three or four pounds. It is true, there were some marked at fifties and hundreds; but it by no means followed that the highly-priced were the first-prized; and people only laughed at what they read in their catalogue, but in which it would seem they seldom put much faith. We give it, not so much as our opinion, but rather that we gathered in Birmingham this last week, that the immense sums now and then announced as realized for cocks and hens are not attended with much practical effect. The world regards them more as entertaining romances, or as some such bargains as that the University of Oxford made with Charles the Second, when he wanted of them a curious portrait of his father. His Majesty would give anything they liked to ask for it; and to this they agreed—what they asked being, that he would give it them back again. There must often be a vast deal of the “give it them back again,” when we hear of a couple of fowls fetching a hundred guineas.

The birds famed, thus far, for these enormous prices, were well represented on the present occasion. The Cochins were as plentiful as ever,

although it is only right to add that never did they appear to attract so little notice, and never, certainly, to command so little admiration. There were still some good fowl amongst them—in the whites more particularly—many of the hens and pullets in this class being really well-shaped birds. The black, and partridge or speckled, were also in some force; while, wonderful to record, the worst of all were unquestionably the buffs. The worst formed, the most awkward looking, and, very justly, the least regarded, were the pure, feather-legged buffs—the only kind that a few months since were worth buying or talking of! Everything, in fact, tends to assure us that the breeding of poultry is surely reaching that reasonable improvement so desirable. Cochins and Brahma Pootras will come to be taken at that they are really worth; and we shall have occasion more and more to congratulate those friends with whom we have been at some little variance, on their return to the dictates of common prudence and common sense.

We have made the poultry show that it was in point of fact—the first feature in the exhibition. We have but to repeat our approval of the excellent manner in which it was arranged, to which the recent enlargement of the Hall greatly contributed. As it was, we imagine the entries were yet more numerous than the Committee could have expected, and hence the limited space in the avenues between some of the pens. So narrow were these, as at times to be actually impassable. It must be remembered that it is here the crowd gathers; and there is room, and more than room, in other parts of the building that might yet further be devoted, to what the flippant still designate as, “the cocks and hens.”

As a purely agricultural society we have said that Birmingham now does much in confirmation, or, perhaps, more properly in support, of the Smithfield Club. We have every reason for recording as much of the meeting just over. We get here a further test of what is doing, and so arrive at sounder conclusions than those we could depend on from the experience of one show alone. This was strikingly remarkable in that description of cattle to which the gold medal of the Midland Counties was awarded. The visitor to the Smithfield Show must have felt that the Herefords were but poorly represented, and that they only suffered by that distinct classification to which they were subjected. Certainly, not as much talked over of late, as either the Durham or the Devon, it might have been reasonably assumed that they were not progressing in accordance with that repute they once enjoyed. The Birmingham meeting corrected any such impression as this. The gold medal went ho-

nestly to a Hereford, while the Herefords generally were unquestionably the best lots of beasts in the yard. When we come to remember that the gold-medal ox of the Smithfield Club stood in another distinct class, and that he was fairly beaten here, we come at once to some direct proof of how necessary this second week's show was, to do proper justice to all those important varieties of stock on which we have chiefly to depend. The Devon suffered in much the same proportion as the Hereford profited, at Birmingham; compared with the London show, he was not fairly represented, although Lord Leicester and Mr. Turner contributed some of those fine, really thoroughbred-looking animals for which they are so deservedly celebrated.

The shorthorn display, generally good, was far more in unison with that we had seen the week previous. The premiums, in fact, went much to the same animals, though not always in the same order; Mr. Stratton here, again, being first and first, but once more without the fame of his gold-medal ox obtaining that further distinction he might reasonably have expected. Decidedly the best specimens of the shorthorn sort were to be found amongst the heifers, of which there was a very strong show; the palm being again disputed by Mr. Ambler's white, and Mr. Phillips' red cow—concerning the real merits of which there was so much controversy in Baker-street. The Birmingham judges refused the precedent of their learned friends who presided on that occasion, and gave the first prize to the white and the second to the red. With this, too, they awarded the gold medal to Mr. Ambler's, as being the best cow in the yard; and there is little question but that in every respect they were right. It is an ungrateful task to dispute the awards, or find fault with the labours of gentlemen who give themselves so much trouble, and who act, we believe, so conscientiously as judges at the agricultural meetings. We take such murmurs, generally, as but symptoms of disappointment and bad taste. There is no doubt, however, that the Smithfield judges made a mistake; and here, again, the value of the Birmingham meeting as confirming, or rather, in this instance, correcting a point, which will now come to be recorded and remembered with far more good feeling and satisfaction, than it otherwise might have been.

Co-equal with the Herefords in merit, though necessarily inferior in numerical strength, came the Highland cattle—a variety for which this Show has always been somewhat celebrated. Mr. Robb, of Thirsk, had a whole "string" of justly "*commended*" beasts, although the first prize was as fairly given to Mr. Campbell—who sent an ox exhibiting in a very extraordinary degree the best points of this picturesque-looking animal.

The Birmingham Show is seldom very famous for its sheep—the best, or at least that class for which it is more peculiarly celebrated, being that very useful animal—the Shropshire Down. In this variety the locality gives it a strength seldom seen at any other meeting. In other sorts, however, the exhibition is but poorly supplied—the Southdowns making but a weak fight of it after the perfections of Smithfield, and the Leicesters yet further tending to add to the retrograde movement there observable. The Leicester, indeed, appears to be growing out of his best points, and declining into a coarse uneven sheep, whose admirers are naturally becoming more and more limited. It is yet but right to say that Mr. Sandy, as one of the judges, was prevented from exhibiting, or his flock might have added materially to the character of the class. It does not sound well, however, when a breed has to depend mainly for its repute on the exertions of any one man.

With his Royal Highness Prince Albert, again, to lead off, we turn into a department of Bingley Hall, that rivals—if anything can rival—the Poultry Show. The Mayor of Birmingham confessed that in all his struggles upwards, to that position he now occupies, there was nothing he was prouder of than his prize pigs. There was some reason, too, for what his Worship admitted. A man to carry off the prize at Birmingham must have a good pig, indeed; and we know few societies where the award would speak more directly to the excellence of the animal. The larger kind are chiefly in favour; the long-sided, lean-headed, curious-coloured Tamworth—the curly-coated, irascible white pig, with other sorts of the same colour, but of far more perfect form. Indeed the white pig of all sizes abounds here; the darker hues, down even to the improved Essex, showing only at long intervals, and then, rarely, with any great distinction.

Our readers will gather from the prize-list we subjoin something beyond that general tone and character of the meeting it is our endeavour to convey in these reports. We give with this, to as full an extent as other claims will admit, an account of the dinner which took place on the Tuesday. Under the direction of a very able president, Lord Howe, "the business of the evening" was kept well and appropriately to the occasion, the townsmen themselves being especially remarkable for the active interest they take in the meeting. As one local orator observed, "Birmingham had always been anxious to do something worth talking about, and there was nothing they had more reason to be proud of than that splendid exhibition they now saw so firmly established." Perhaps the most practical speech of the evening was that from the essentially

practical man—Mr. Wright, the gentleman to whom above all others is due the credit of originating the Midland Counties' Show. It will be found that in the course of his remarks, Mr. Wright took occasion to comment on what Mr. Willoughby Wood has written with so much ability in the *Mark-Lane Express*, as to the prizes to be offered for Horses at the forthcoming summer show. This was done in the best spirit, as a question should be argued; although we believe our correspondent, as well as our own reasoning, yet remains unanswered. To ensure a better show of horses you must give better prizes.

LIST OF PRIZES.

HEREFORDS.

CLASS I.—OXEN OR STEERS.

First prize, £10, and silver medal as breeder, James Ackers, Esq., Prinknash Park, near Painswick, Gloucestershire. Second prize, £5, Mr. Joseph Greenaway, Radley, near Abingdon, Berkshire.

Highly commended, Mr. John Tucker, Abbey Print Works, Stratford, Essex.

Commended, Mr. John Tucker, Abbey Print Works, Stratford, Essex; and Mr. Joseph Phillips, Ardington, near Wantage, Berkshire.

CLASS II.—STEERS.

First prize, £10, also the gold medal and extra prize of £20 for the best ox or steer in the yard, Mr. William Heath, Ludham Hall, Norwich; silver medal to the breeder, Mr. Thomas Carter, Dodmore, Ludlow, Shropshire. Second prize, £5, Mr. John Tucker, Abbey Print Works, Stratford, Essex.

Commended, The Earl of Warwick, Warwick Castle; Mr. Samuel Druce, Eynsham, near Oxford; and Mr. John Tucker, Abbey Print Works, Stratford, Essex.

CLASS III.—COWS.

First prize, £10, Mr. Richard Hill, Golding, near Shrewsbury; silver medal to breeder, Mr. James Badham, Pontpianna, Vowchurch, Herefordshire. Second prize, £5, Lord Hatherton, Teddesley Park.

Commended, Mr. William Sheward Cartwright, Newport, Monmouthshire; and Mr. John Walker, Westfield House, Holmer, Herefordshire.

CLASS IV.—HEIFERS.

First prize, £10, Mr. Wm. Heath, Ludham Hall, Norwich; silver medal to breeder, Charles Henry Beddoes, Esq., R.N., Hopesay, Shropshire. Second prize, £5, Captain Musgrave, Claverdon, Warwickshire.

Very highly commended, with silver medal to exhibitor, Mr. Robert Beman, Moreton-in-the-Marsh, Gloucestershire; and Mr. Wm. Stedman, Bedstone Hall, near Ludlow, Shropshire.

SHORT-HORNS.

CLASS V.—OXEN OR STEERS.

First prize, £10, and silver medal as breeder, Mr. Richard Stratton, Broad Hinton, near Swindon. Second prize, £5, Mr. William Brandham, Dringhoo, near Louthorpe, Bridlington.

Commended, Mr. Stephen Gooch, Honingham, Norwich.

CLASS VI.—STEERS.

First prize, £10, and silver medal as breeder, Mr. Richard Stratton, Broad Hinton, near Swindon. Second prize, £5, Mr. James Stratton, Reading.

CLASS VII.—COWS.

First prize, £10, Mr. J. H. Lees, Bacon's End, near Birmingham; silver medal to breeder, the late Mr. Henry Lees, Bacon's End. Second prize, £5, Mr. Henry Smith, The Grove, Cropwell Butler, Bingham, Nottinghamshire.

Commended, Mr. Henry Ambler, Watkinson Hall, near Halifax, Yorkshire; and Mr. William James Sadler, Bentham Purton, Swindon, Wiltshire.

CLASS VIII.—HEIFERS.

First prize, £10, and silver medal as breeder; also the gold medal and extra prize of £20 for the best cow or heifer in the

yard, Mr. Henry Ambler, Watkinson Hall, near Halifax. Second prize, £5, Mr. Joseph Phillips, Ardington, near Wantage, Berkshire.

Commended, Viscount Hill, Hawkstone, Shropshire; Chas. Barnett, Esq., Stratton Park, Biggleswade, Bedfordshire; and J. H. Langston, Esq., M.P., Sarsden House, near Chipping Norton.

DEVONS.

CLASS IX.—OXEN OR STEERS.

First prize, £10, Earl of Leicester, Holkham Hall, Wells, Norfolk; silver medal to breeder, Mr. George Turner, Barton, near Exeter. Second prize, £5, Mr. William Heath, Ludham Hall, Norwich.

Commended, Earl of Aylesford, and Earl of Leicester.

CLASS X.—STEERS.

First prize, £10, and silver medal as breeder, Mr. George Turner, Barton, near Exeter. Second prize, £5, the Earl of Leicester.

CLASS XI.—COWS.

First prize, £10, and silver medal as breeder, Mr. Abraham Umbers, Weston Hall.

CLASS XII.—HEIFERS.

First prize, £10, and silver medal as breeder, Mr. Abraham Umbers, Weston Hall. Second prize, £5, Earl of Aylesford.

LONG-HORNS.

CLASS XIII.—COWS OR HEIFERS.

First prize, £10, and silver medal as breeder, Mr. R. H. Chapman, Upton, near Nuneaton. Second prize, £5, Mr. R. H. Chapman, Upton, near Nuneaton.

FOR OTHER PURE-BREEDS AND CROSS-BRED ANIMALS

CLASS XIV.—FAT OXEN OR STEERS.

First prize, £10, and silver medal as breeder, His Grace the Duke of Beaufort, Badminton. Second prize, £5, Mr. R. H. Chapman, Upton, near Nuneaton.

CLASS XV.—FAT COWS.

(No entry.)

CLASS XVI.—FAT HEIFERS.

First prize, £10, and silver medal as breeder, Mr. George Worth, King's Newnham, near Rugby. Second prize, £5, Mr. George Worth, King's Newnham, near Rugby.

SCOTCH OR WELSH BREEDS.

CLASS XVII.—OXEN OR STEERS.

First prize, £10, Alexander Campbell, Esq., Monzie Castle, Crieff, N.B. Second prize, £5, the Duke of Beaufort.

Commended, five West Highland animals belonging to Mr. Joseph D. Rob, Thorpfield, Thirsk, Yorkshire.

CLASS XVIII.—HEIFERS.

Prize, £5, Robert Berkeley, Esq., Spetchley Park, near Worcester. Also commended.

EXTRA CLASSES.

FOR ANIMALS NOT QUALIFIED TO COMPETE IN ANY OF THE PRECEDING CLASSES.

CLASS XIX.—OXEN OR STEERS.

Silver medal, Mr. Thomas Walker, Newbold-on-Avon, near Rugby.

CLASS XX.—COWS OR HEIFERS.

Silver medal, Lord Berwick, Cronk-hill, near Shrewsbury.

SHEEP.

CLASS XXI.—LEICESTERS.—FAT WETHERS, NOT EXCEEDING TWENTY-TWO MONTHS OLD.

First prize, £10, silver medal as breeder, and also silver medal as exhibitor of the best pen of long-woolled sheep in classes 21, 22, 23, and 24, the Marquis of Exeter. Second prize, £5, Mr. Lawrence Willmore, The Newark, Leicester; who was also commended, with the Marquis of Exeter.

CLASS XXII.—LEICESTERS.—FAT WETHERS, EXCEEDING TWENTY-TWO MONTHS OLD.

First prize, £10, and silver medal as breeder, Mr. George Turner, Barton, near Exeter. Second prize, £5, Mr. J. H. Lees, Bacon's End, near Birmingham.

Commended, the Marquis of Exeter.

CLASS XXIII.—LONG-WOOLLED SHEEP, NOT BEING LEICESTERS.—FAT WETHERS, NOT EXCEEDING TWENTY-TWO MONTHS OLD.

First prize, £10, and silver medal as breeder, Mr. Robert Beman, Moreton-in-the-Marsh.

CLASS XXIV.—LONG-WOOLLED SHEEP, NOT BEING LEICESTERS.—FAT WETHERS, EXCEEDING TWENTY-TWO MONTHS OLD.

First prize, £10, and silver medal as breeder, Mr. Robert Beman, Moreton-in-the-Marsh.

CLASS XXV.—SOUTH AND OTHER DOWN SHEEP.—FAT WETHERS, NOT EXCEEDING TWENTY-TWO MONTHS OLD.

First prize, £10, and silver medal as breeder, Mr. John Williams, Buckland, Farringdon, Berkshire. Second ditto, £5, Lord Walsingham.

Highly commended, Mr. John Williams, Buckland, Farringdon, Berkshire.

Commended, Viscount Hill; and Earl of Leicester.

CLASS XXVI.—SOUTH AND OTHER DOWN SHEEP.—FAT WETHERS, EXCEEDING TWENTY-TWO MONTHS OLD.

First prize, £10, and silver medal as breeder, also silver medal as exhibitor of the best pen of Short-woolled Sheep in Classes 25, 26, 27, and 28, Sir Robert Throckmorton, Bart., Buckland, Farringdon, Berkshire. Second ditto, £5, Viscount Hill.

CLASS XXVII.—SHROPSHIRE, AND OTHER BLACK OR GREY-FACED SHORT-WOOLLED SHEEP.—FAT WETHERS, NOT EXCEEDING TWENTY-TWO MONTHS OLD.

First prize, £10, and silver medal as breeder, Mr. Stephen Mathews Mountford, near Shrewsbury. Second ditto, £5, Thomas Charlton Whitmore, Esq., Apley Shropshire.

Commended, Mr. Richard Thomas Woodhatch, near Bishop's Castle, Shropshire; and William Foster, Esq., Kinver Hill Farm, near Stourbridge, Worcestershire.

CLASS XXVIII.—SHROPSHIRE AND OTHER BLACK OR GREY-FACED SHORT-WOOLLED SHEEP.—FAT WETHERS, EXCEEDING TWENTY-TWO MONTHS OLD.

First prize, £10, and silver medal as breeder, the Hon. Robert Curzon, Hagley Farm, near Rugeley, Staffordshire. Second ditto, £5, Earl of Aylesford.

Commended, Mr. William Masfen, Norton Caines, near Walsall.

CLASS XXIX.—CROSS-BRED SHEEP.—FAT WETHERS, NOT EXCEEDING TWENTY-TWO MONTHS OLD.

First prize, £10, and silver medal as breeder, Mr. John Benjamin Twitchell, Wilby, Northamptonshire. Second ditto, £5, Mr. William Gillett, South Leigh, Oxfordshire.

Commended, Mr. Samuel Druce, Eynsham, near Oxford; the Marquis of Exeter; the Earl of Leicester; Mr. Thomas Hemming, Coldcott, Moreton-in-the-Marsh; Mr. William Gillett, South Leigh, Oxfordshire; and Mr. Charles Howard, Biddenham, near Bedford.

CLASS XXX.—CROSS-BRED SHEEP.—FAT WETHERS, EXCEEDING TWENTY-TWO MONTHS OLD.

First prize, £10, and silver medal as breeder; also silver medal as exhibitor of the best pen of Cross-bred Sheep in Classes 29 and 30, Mr. Thomas Hemming, Coldcott, near Moreton-in-the-Marsh; second ditto, £5, Mr. Thomas Walker, Newbold-on-Avon, near Rugby.

Commended, Mr. Samuel Druce, Eynsham, near Oxford.

PIGS.

CLASS XXXI.—FAT PIGS, NOT EXCEEDING TEN MONTHS OLD.

First prize, £10, and silver medal as breeder, his Royal Highness Prince Albert. Second prize, £5, Mr. William Beach, Monument Lane, Birmingham.

CLASS XXXII.—FAT PIGS, NOT EXCEEDING FIFTEEN MONTHS OLD.

First prize, £10, and silver medal as breeder, Mr. William James Sadler, Benthams Purton, Swindon, Wiltshire. Second prize, £5, Mr. James Wyley, jun., Longdon, near Rugeley.

CLASS XXXIII.—FAT PIGS, EXCEEDING FIFTEEN MONTHS OLD.

First prize, £10, and silver medal as breeder, Mr. L. Brodhurst Hill, Bach Hall, Chester. Second prize, £5, the Duke of Sutherland, Trentham, Staffordshire.

Commended, the Duke of Sutherland; Mr. William James Sadler, Benthams Purton, Swindon, Wiltshire; and Mr. William Hopkins, Deritend, Birmingham.

CLASS XXXIV.—BREEDING PIGS OF A LARGE BREED, EXCEEDING THREE AND NOT EXCEEDING SIX MONTHS OLD.

First prize, £10, Mr. William James Sadler, Benthams Purton, Swindon, Wiltshire. Second prize, £5, Mr. William Endall, Henley-in-Arden.

Commended, Mr. Joshua Kershaw, Knostrop, near Leeds.

CLASS XXXV.—BREEDING PIGS OF A SMALL BREED, EXCEEDING THREE AND NOT EXCEEDING SIX MONTHS OLD.

First prize, £10, and silver medal as breeder, Mr. Samuel Wiley, Brandsby, near York. Second prize, £5, Mr. Charles Leigh Clare, Hindley House, Liverpool.

JUDGES OF CATTLE.—Mr. John Booth, Killerby, Catterick, Yorkshire; Mr. Philip Halse, Molland, near South Moulton, Devon; Mr. Henry Chamberlin, Desford, near Leicester.

JUDGES OF SHEEP.—Mr. William Sanday, Holme Pierrepont, Nottinghamshire; Mr. Valentine Barford, Foscoate, near Towcester; Mr. John Meire, Newport, Salop.

JUDGES OF PIGS.—Mr. John Moore, Kelland Barton, near Crediton, Devon; Mr. William Torr, Aylesby Manor, Great Grimsby; Mr. J. C. Etches, Harley Thorn, near Stone, Staffordshire.

REFEREE FOR THE AGE OF PIGS.—Mr. William Hollingsworth, Bilston.

THE ANNUAL DINNER.

There was a good attendance, upwards of one hundred gentlemen being present. The Right Hon. Earl Howe occupied the chair; Alderman Hawkes (the ex Mayor) discharged the duty of Vice-President. There were also present, J. Baldwin, Esq., Mayor; Lord Calthorpe; the Hon. Mr. Butler; C. N. Newdegate, Esq., M.P.; R. Spooner, Esq., M.P.; W. Mathews, C. M. Caldecott, Baron D. Webster, C. Shaw, W. James, H. Luckcock, Chandos Wren Hoskyns, and T. B. Brandreth Gibbs, Esqrs.; Aldermen Lucy, Phillips, and Hodgson; Councillors Mole, Blews, Harlow, and Lingard; Rev. L. P. Mercier, Rev. W. R. Bedford (of Sutton); Messrs. J. B. Freer, E. T. Cox, Baldwin, Stanley, Stratton, Neve, Harris, Moon, Boddington, Halse, G. Turner, of Barton, Corbet, V. Barford, H. Chamberlin, Heath, Jeremiah Matthews, T. B. Wright, J. Lowe, J. Shackel, B. Dain, W. Mathews, jun., H. Wildman, and others.

After the usual loyal toasts,

The Mayor gave, "The House of Lords" (cheers). Although it might seem strange that he—a Radical—should be found proposing that toast, yet he could sometimes exclaim with old Cobbett, "Thank God, we have a House of Lords." Many of his friends were farmers under the nobility; and he found this, that they made the best of landlords (cheers). He appreciated good qualities in all classes of men, and for that he honoured the nobility. True, the House of Lords had sometimes, and for a time, opposed measures which they conceived were not for the good of the country, even although the country differed with them in that opinion; yet he felt sure that there was not one of those noble Lords who did not rejoice in the prosperity of the kingdom, although brought about by means opposed to their views. He believed that the House of Lords did everything they

could for the general welfare of the community; and feeling, farther, that they were instrumental in achieving great good to the country, he asked that the toast should be drunk with every demonstration of regard (great cheering).

The Noble CHAIRMAN felt sure that he spoke the sentiments of every peer when he said that they would sooner see the House of Lords sink to the bottom of the ocean than they should be found acting contrary to what they believed to be the interests of their fellow-subjects. The House of Lords was actuated by only one feeling—that of promoting to the utmost the general prosperity of all classes (cheers).

Lord CALTHORPE gave "The House of Commons" (cheers). His noble friend, he said, had stated that the House of Lords was actuated only by a desire to promote the best interests of the country. He (Lord Calthorpe) thought he might say that also of the great majority of the House of Commons. They had not to go far to find illustrations, not only of that feeling, but of perseverance, intelligence, vigilance, and integrity (cheers). He only wished that the same degree of intelligence, ability, and perseverance was shown by the majority of the House of Commons as by the two members who honoured the table that night by their presence (loud cheers).

Mr. NEWDEGATE, M.P., in returning thanks, said that it was never very easy adequately to do justice to the toast. He believed that, whatever were the imperfections in the mode in which the House of Commons was returned, it was a true reflex of public opinion; and in these days of vicissitude and change throughout the world, it was something for England to be proud of that she had the most ancient and stable legislative assembly existing. There did not exist, he felt assured, a body of men more anxious to perform their duty to their country (loud cheers). There was one marked characteristic of the Commons, and it was this: that although, like all deliberative assemblies, it might at times show a disposition to encroach on the functions of other parts of the constitution, still it was always willing and ready to accept the opinion of the other branch of the Legislature in matters of grave importance, in which it was convinced that the other body was better qualified to form an opinion (Hear, hear). They were told that the House of Commons might be reformed. If they were to judge by the exertions it had made already and recently, it would not be lax to reform itself in no very partial spirit. He could not sit down without acknowledging in connection with the toast the great services of the Speaker, who was morally the Regulator of the opinion of that assembly, and to whom the country was more indebted than was generally known. In conclusion he (Mr. Newdegate) could only beg to assure them that the house was anxious to fulfil its duties faithfully; and was willing and ready to change its constitution, if there was the slightest doubt of the purity of its motives.

Mr. SPOONER, M.P., being directly called on, assured those from whom he differed that he respected their opinions. He differed with regret. He was sure they would give him credit for the honesty of his convictions; from which he dared not dissent so long as he felt assured of their truth (cheers).

Mr. WILLIAM MATHEWS then gave "The Agricultural Interest" (cheers). The pursuit of agriculture found always a warm sympathy from every man whose heart was in the right place (cheers). There was no pursuit, however pleasing or profitable, they were not desirous of giving up to enjoy the pleasure involved in agricultural life. He felt that his old friend, the Mayor, engaged as he was in manufacturing, had more pleasure in surveying his stock of fat pigs than in his civic honours (cheers and laughter). There could not be a doubt of it; he turned, like Cincinnatus, to his farm again. Although there he did not desire to enter on topics on which differences of opinion might prevail, yet he might be allowed to say that corn and currency had a larger signification than the world generally supposed. (Hear, hear). The walls of that room he had heard more than once re-echo with the subject; and he might venture to make one slight allusion to the new position in which the agricultural interest was placed by the question of the currency. From the year 1340 to the year 1560 the average price of the quarter of wheat was only 18s. A little previous to 1650—in 1648—the discovery was made of the mines of Mexico and Peru, that brought an entire change over agriculture and all other interests. In twenty years the prices of corn and other commodities were nearly tripled, and wheat bore the proportion of nearly 50s. a quarter for the next 200 years. Then came Acts of Parliament, corn laws, followed by disputes, strikes, and differences of opinion, political and social. Now, it seemed as if Providence, having pity on our defects, brought in its own bill of California and Australia—(Hear, hear)—a bill to which he looked with most sanguine expectations—with which, if they didn't interfere with any crotchety plans of their own, would put every interest in its proper position (Hear). They had disputes, strikes, differences between the employer and the employed, with faults on the part of the men, and perhaps too high a tone on the part of the masters; but he had such a strong faith in the Anglo-Saxon good sense of the country, that he hoped soon to see them get beyond all aberrations of this kind; that they would find all interests united—their only rivalry the emulation of well doing (cheers). Speaking as a large employer of labour, and as expressing the sentiments of those in a similar position, he could say that they looked to see the day when every man should be able sometimes to sit under his own vine and fig-tree, in the enjoyment of the pleasures of a country life. All hail, then, to agriculture! He had to ask them to drink success to it, and he did so with the very best wishes of his heart (loud cheers).

Mr. G. M. CALDECOTT then gave "The Manufacturing and Commercial Interests" (cheers). One might be prosperous when the other was suffering; but, in the long run, all interests must be prosperous for the country to be flourishing. Of course he would not ask them to trouble themselves by inquiring as to why they were prosperous, but let them thank God that they were so (Hear, hear). And let them recollect that, unless they could abolish all class legislation working against the general good, any prosperity they might enjoy would be very temporary.

Mr. SPOONER, M.P., then gave "The Health of their Noble President," who had so kindly favoured them with his company on that occasion (loud cheers)—a nobleman well known amongst them as the possessor of a great and valuable property; as one who valued his rights and knew its duties, and who, knowing these duties, had been most ready in the perfect and complete performance of them (cheers). In these relations of life they knew Lord Howe, and would give expression to their feelings regarding them; but it was in an-

other character they had then to regard him—in the character of the President of their Society; as giving a sanction to it which his name gave to every association with which he was connected, stamping its character and securing it respect.

LORD HOWE briefly responded. He had felt some difficulty in consenting to preside, although, at the same time, he was confident that any man who came amongst such a society as that, endeavouring to do his best, would always meet with a hearty reception. The noble Earl then gave the health of "The Vice-President, the Mayor" (cheers).

THE MAYOR, for himself, could truly say that he should ever feel a deep interest in the prosperity of the agricultural interest, and for the town of which he had the honour to be chief magistrate—he thought he might also say that there was no other in England, Ireland, or Scotland, which took so deep an interest, and had always done so, in the prosperity of the agriculturists (cheers). Some persons were able to boast that their ancestors were of noble blood: his for many centuries had been old English farmers (Hear). He had followed the plough himself for his living; he came here a poor lad, and now by some extraordinary changes or other he found himself in the position of chief magistrate of one of the most important towns in the empire (cheers). He hoped for himself that he should live long to meet many of his friends the agriculturists, in whose prosperity he took the warmest interest (cheers).

THE VICE-CHAIRMAN then gave the health of the President Elect, Lord Leigh.

THE HON. MR. BUTLER gave "The Successful Exhibitors"; and the toast was acknowledged by Messrs. Heath and Stratton.

THE REV. W. R. BEDFORD rose and introduced with much humour the next toast—"The Unsuccessful Competitors."

The noble CHAIRMAN, as one of the unfortunates whose health had been drunk so consolingly, returned thanks on their behalf.

MR. GIBBS gave "The Judges and Stewards."

MR. CHAMBERLAIN, in acknowledging the compliment, said it was with very great pleasure that he had assisted in awarding the prizes in connection with such a very excellent show, the pleasure being the greater in consequence of his knowledge that the exhibition was one so very young, and characterised by such quick progress to maturity during its five years' existence (Hear, hear). This was not a matter for surprise when they considered that it had been planted in a large, wealthy, and populous manufacturing town such as Birmingham. It was the object of such institutions as that to produce the best animals—animals that would supply the agricultural and manufacturing population with the cheapest and best meat that could possibly be grown. Some people might ask what was the use of feeding an extraordinary fat ox? If the good remained with that ox alone, it would not be of much value; but they must recollect that if a farmer bought an excellent bull or ram, the benefit was not confined to one animal, but was extended to the whole herd or flock, and not only to his own property, but to that of his neighbours also (Hear, hear). He could assure them that in awarding the prizes the judges had acted to the best of their ability; and although some gentlemen might feel a little disappointed, as was invariably the case at exhibitions of that kind, they ought to recollect that where there were so many good animals, the office was indeed a very difficult one (Hear, hear).

MR. MEIRE, of Newport, as one of the judges in sheep, also returned thanks. He could assure them that it had afforded him the greatest gratification to see assembled so many who

seemed to be so heartily disposed towards everything connected with the cultivation of the soil. He had been struggling for many years to bring about district exhibitions throughout England, and his Shropshire friends would bear him out that long before the Midland Counties Exhibition was started, he had proposed a similar scheme, believing that small local exhibitions engendered petty angry feelings rather than a desire for general good. He would ask, whether in shows such as they had that day witnessed, where excellence of the highest order was manifest, there could be a feeling of anything like petty jealousy. The unsuccessful competitors could scarcely consider their defeat a disgrace when they saw that there was scarcely a bad animal in the yard. One of the most observable features was that the animals now contained a greater amount of consumable food than had ever before been experienced. Taking advantage of his position in connection with the sheep department, he might say that, however excellent the southdown was, still their great object should be to select an animal well adapted for all the varieties of soil and climate that existed in England. After some further practical remarks, Mr. Meire concluded by saying that though London most undoubtedly stood A. 1. in such matters as drawing together the best animals that England produced, yet what they had witnessed that day showed that Birmingham was indeed treading very closely upon the heels of the metropolis (cheers).

MR. WILLIAM MATHEWS gave the health of Mr. Wright, as the founder of the society.

MR. WRIGHT, in acknowledging the toast, remarked that this was the fifth occasion on which a similar compliment had been paid to him, and with the same cordiality and kind expressions. His first feeling—as it would always be—was one of thankfulness that he was enabled again to meet his friends in that room, and to take part in the interesting proceedings of the week. With regard to the exhibition and the progress of their society, he thought there was every reason for congratulation, and for the opinion which he for one entertained that their future prospects were most encouraging. The show they had just left surpassed, he was quite sure, the expectations of the most sanguine of its supporters, and exhibited a very gratifying accession of strength. (Hear, hear.) Their meeting this year was in all respects satisfactory, and everything tended to show that their society had attained a permanent character. It was the conviction that this was the case that induced the Council to determine upon a great extension of their operations, by the announcement of a first exhibition of store stock and agricultural implements, to be held in June next. (Cheers.) The prize list for stock to be shown at this meeting had been for some time in the hands of the principal breeders, and he was glad to know that it had been highly approved, and that many gentlemen had already promised to become competitors. One exception, however, had been taken to the list for horses, and that in a very useful series of letters by Mr. Willoughby Wood, which were now in course of publication in the *North Lane Express*. Mr. Wood contended that the prizes for thorough-bred horses should have been fixed at least as high, if not higher, than those for horses suitable for agricultural purposes. This opinion he (Mr. Wright) was not disposed to object to, as it was probably not worth while to make a distinction in any of the classes. But at the same time Mr. Wood should recollect that agricultural shows were not the places where distinction was sought for the best thorough-bred stock, but that the prizes most coveted by their owners were offered at Epsom, Doncaster, Goodwood, and other great racing meetings—a very different arena to Bingley Hall. (Hear, hear.) An extra £10 would not bring the Flying

Dutchman to Birmingham in June next; and whenever West Australian was put to the stud, it certainly would not be said of him that he had won a prize at Lincoln, or Birmingham, or York, but that he had won the Two Thousand Guineas, the Derby, and the St. Leger. The reason why the various societies had offered so little in the way of prizes for thoroughbred horses, and for roadsters also, was really this, that the competition had generally been of a most limited character; and anything which could lead to a better class of horses—and especially roadsters—being brought together at all the leading meetings would no doubt be productive of great advantage. He (Mr. Wright) looked upon the store show as a most important extension of the society's operations; and he did not disguise it from himself, as he would not from that meeting, that the work now undertaken would entail a vast amount of responsibility upon the Council, and require for its accomplishment a very complete organization, and an efficient staff. In fact, every one interested in the success of what had been so well begun should be prepared to afford the most active assistance; while those to whom the actual management was entrusted should each take for his guidance the well-known proverb, that "nothing moves without being moved" (cheers). With regard to the support of the agricultural body, he thought that their experience would warrant him in saying that this might be safely relied upon, so long as their affairs were fairly and honourably conducted, and so long as they invited gentlemen of high character to award their prizes, who were capable of forming sound opinions on the stock submitted to them, and who were willing to co-operate with the council in their efforts to make the show conducive to really practical and useful objects (cheers). What they now contemplated would of itself lead to an increase in their numbers, and he trusted that this increase would be very great; for, looking at the position of their society, and the important objects for which it was founded, he thought their members should be told by thousands, and not by hundreds. It was undoubtedly a most desirable thing that a great agricultural meeting should be held in the centre of England, in a town affording and willing to supply the most excellent accommodation in all respects, and in the centre of a district in which had been found many of the most intelligent and successful agriculturists of the present time, both landlords and tenants. He need only mention the names of the Earl of Aylesford, Lord Hatherton, Earl Talbot, Sir Francis Lawley, the Earl of Warwick, the Chapmans, the Umbers, and other men of that character, so well known wherever the progress of agriculture was a subject of interest. The marvel was, not that their progress had been so rapid, but that in the midland counties, with all the materials at our hands, we had been so late in the field with a movement of this kind (Hear, hear). Mr. Wright, in conclusion, again acknowledged the compliment paid to him, and the courtesy which he had received, not only from many gentlemen in that room, but also from everyone with whom the business of the show had brought him in connection. For himself, he had worked zealously, and he trusted with some effect, to carry out a most useful public object. The labour had in former years been undoubtedly great, and no other consideration whatever but that of promoting what he felt much interest in would have induced him to undertake it. He doubted whether in future he should be enabled to devote so much time to their society as he had hitherto done, but his anxiety for its success would lead him to give all the assistance he could. By the kindness of the meeting, he had been compelled to speak perhaps too much of himself; but he need scarcely remind them that they were really indebted to the members of the council, who took an active share in the ma-

agement, for the excellence and success of the arrangements (Hear, hear). Their show had increased with such rapidity, that every year brought the same work with regard to the fittings and the reception and disposal of the stock; and this year, owing to the extraordinary character of their poultry show, the labour had been vastly increased. Ardous as it was, however, it had been cheerfully undertaken by a few members of their council; and the entire approval of all that had been done, both by exhibitors and visitors, would, he was sure, be altogether most gratifying (cheers).

Mr. CHANDOS WREN HOSKYNs said, for the last fifteen or sixteen years—ever since the commencement of the Royal Agricultural Society—one of the happiest days the summer months brought him was that on which he was enabled to go through the admirable collection of implements which that society was the means of bringing together. He held that, with regard to what they had heard lately as to the application of steam to the cultivation of the soil, and more especially to clay soils, the present ideas on the subject were totally erroneous. In tilling light soil the great object was to sustain it as much as possible, while with clay the object was to lift it as lightly as it could possibly be done; so that the more a rough was adapted to the former, the less likely it became an instrument adapted for following the system carried out in the latter. It was necessary that the soil should be pulverised, or comminuted, as well as exposed to the atmosphere, or aired; and he believed this was about to be accomplished by an instrument which was worked by steam-power (Hear, hear). Steam was no longer a parallel to be taken from manufactures as applicable to agriculture, but it was an argument which had only to be transferred from the farmyard to the field; and he hoped that, ere long, they would witness that greatest triumph of the steam-engine which would adapt its power to the ever-varying necessities of the soil of England. Their thanks were peculiarly due to the manufacturers of implements, because every implement they produced was an increase of power to the human hand, and thereby an extension of the power of the human brain, to which the hand was the minister. Its final uses were physical; but they knew that physical power lay at the bottom of moral and intellectual nature, and was the foundation of the highest aims and the highest accomplishments of the human race. It was with much pleasure, therefore, that he gave "The Manufacturers of Agricultural Implements" (cheers).

Mr. JOHN LOWE, as the only representative of the agricultural implement makers present, acknowledged the toast.

The CHAIRMAN next gave "The Royal Agricultural Society, the Smithfield Club, and the other Agricultural Societies in the United Kingdom."

Mr. TURNER, of Barton, Exeter, responded. As a member of the council, he thought they had done wisely in wishing success to that institution; for it could be proved that it had done more good in the period since it had been established than any other society which had ever been formed by man (Hear). Looking back to the period when it was established, he recollected that it was a great relief to him to go into the council chamber of the Royal Agricultural Society, and find there Whigs and Radicals, Tories and Conservatives, all united for the attainment of one common object—the means of producing more food and more raiment for man.

Mr. BODDINGTON, of Sutton, also responded as a member of the London Farmers' Club, one of, he said, the most useful of the agricultural institutions of the country. It had been a source of great gratification to him to witness the success of the exhibition that day, and equally so to witness the growing good feeling between the agricultural and com-

mercial interests; for, like the Siamese twins, one could not be injured without that injury being with increased pain inflicted upon the other (cheers).

The CHAIRMAN then gave the last toast on the list, "The Ladies," which being acknowledged with the usual honours, the company separated.

TIPTREE HALL.—MR. MECCHI'S BALANCE SHEET.

One of our most eminent men attributed his success in life to the difficulty, which he found at starting, in being able to satisfy himself. It is not all of us who encourage so serious an impediment. There is, rather, often enough a feeling of self-satisfaction which induces us to think the best of our own doings, and to brighten up every effort with the sanguine hue of full confidence and high spirits. Our friend, Mr. Mechi, is a philosopher of this more accommodating school. Everything he does is sure to be of the best. The latest experiment on Tiptree-heath is always the most important, as the greatest novelty the first recommendation for its adoption. The word failure, too, as with another great man, is unknown; in some degree, at least, every scheme answers, as we are smilingly assured by the mercurial gentleman who is doing so much, and profiting as proportionately by his exertions. In an essentially practical age we come, sooner or later, to the proof. Whether it be Mr. Cobden's philanthropy or Mr. Mechi's farming, we want to see how the plan is to be carried out. There may be some mystery even yet about the proceedings of that inestimable institution, the Peace Society. There is none, however, about the Tiptree farming. If you want proof, you can have it, as readily as a prescription for removing a hedgerow or for raising, a shower of liquid manure.

But after all, with his good humour and good spirits, there is some little want of "pluck" about Mr. Mechi. Though none be so ready to tell others their failings, few wince so much on hearing their own. He is but half a friend to the cause, who acts as if no one could aid it but himself. The pursuits of agriculture, like everything else, must come to proof for their confirmation. No one is asked more frequently for this than Mr. Mechi. No one, indeed, so continually challenges it; and none, we may add, so systematically avoids it. In our record of that very pleasant day, the Tiptree Hall gathering of this last summer, we found everybody called on for his opinion of what he saw there—but the practical farmer! The proof was asked of those only who were the least qualified to give it; and the decree thus attained was, naturally, in the highest degree, satisfactory. The awkward gentleman in the play, who felt himself nervously out of place, was assured that he would get on very well

if he confined his remarks to the simple piece of criticism that everything he saw was "d—d fine!" So it was with the grand company at Tiptree—the learned and unlearned friends, who, wisely profiting by the precedent we have mentioned, listened, examined, and approved. Everything, from the mangels to the luncheon, was "d—d fine!"

We have been indirectly assured that this kind of proof should be improved on, and that the invitation to test the agriculture of Tiptree should be, really something more like that it professed to be. We are afraid we can discern little, as yet, of so desirable an alteration. Mr. Mechi comes before the world again this week with another balance-sheet. Mr. Mechi does this, of course, in obedience to the call so often made on him, and with the only desire of having his statement fully and fairly discussed. To accomplish this he delivers it in person at a meeting, ready to answer any query or argue on any objection which may be offered to anything he may have advanced. To insure such thorough investigation he makes terms for one of the Wednesday evenings of the Society of Arts—an institution that, in his own words, "has conferred, and will confer, important additions to the knowledge, comfort, and happiness of the British people." We have not the least wish to dispute the character Mr. Mechi gives so really serviceable a society, but was it the most fitting scene for his address? Was there authority insured here to "pass," modify, or condemn any of the practices of Tiptree Hall? We are afraid not. The momentous question was raised; the balance-sheet was read; its author's ideas on the different appliances of modern agriculture submitted—and he sat down. With him we might justly enough close the report and the proceedings. It is true, "the chairman invited discussion;" and one gentleman considered that "chloride of zinc was highly poisonous"—another that "sewage water should be filtered through peat charcoal." A third informed the meeting that "silica of soda was extensively used in preparing calico for the dye-tub." Dr. Lyon Playfair was convinced "Mr. Mechi was applying his manure to the land in a proper and natural manner." Plenty of speakers were anxious to insist on "giving the people a better education;" and quite as many "to express their thanks to, and with them their highest

approval of the practices of, Mr. Mechi." There does not appear to have been a man in the room who arrogated to himself the slightest acquaintance with the pursuits of agriculture.

So much for the approval of the Society of Arts. Could not Mr. Mechi have found some other place a little more appropriate to the nature of his entertainment? Suppose the Farmers' Club is a little too severe in cross examination—admit they might have taken the test there somewhat critically—it would have been but the more valuable for that very reason. Or, could not the Royal Agricultural Society have spared a morning for the consideration of so interesting a topic? Let us talk to somebody that knows a little of that we are teaching and learning. It strikes us it would have been better even to have brought out the Balance Sheet at home—at some meeting, say, of the Witham Society, with William Hutley for the prosecution, and James Beadel for the defendant.

We will do Mr. Mechi more justice than in this instance he has done himself. We will give him the credit of, after all, being really desirous of having his balance-sheet once more properly discussed. With this view, we publish his statement in full. We invite, moreover, not only the attention of our readers to it, but their opinions upon it. There are one or two items in his accounts to which we might at once cavil. So far, however, we purposely refrain from doing so—preferring rather to let the reader stand in the place of an audience, and take what he hears exactly in his own way. Mr. Mechi, gentlemen, is a brother-farmer—a young and sanguine man, who believes he is already making a fortune by the business. It will be our duty to ascertain how far he is justified in this opinion.

At the weekly meeting of the Society of Arts on Wednesday, Dec. 14—Mr. Harry Chester presiding—Mr. Mechi read the third report on the results of experiments at Tiptree-hall Farm. He said: Considering it to be both a public duty and public benefit to lay before the world our practice in any particular art, be it successful or unsuccessful, I venture once again to appear in your arena, feeling that it is the field on which has been fought and won many a battle in the cause of progression and amendment. I am not here to flatter your society, of which I have the honour to be a member; but I speak the truth, and my own sentiments, when I say that it has conferred, and that it will confer, important additions to the knowledge, comfort, and happiness of the British people. When last I addressed you, agriculture presented an aspect of doubt and melancholy; forsaken by legislation and politics, she was abandoned to her own resources, that unknown mine from which she is now beginning to draw important and untold treasures. On the occasion to which I allude, my celebrated balance-sheet was held up with political

triumph, or mourned over by sincere doubt and mistrust; but those times are past, never to return; so we can now breathe freely, and discourse about the strength or weakness of agriculture, unbiassed by political asperities. I shall have to-night to present to you another balance-sheet, and I propose very particularly to call your attention to the new method of irrigation, as practised successfully by me, involving in its consideration our water supply, sanitary condition, and physical support; the application of steam to cultivation will also deserve our notice. However gloomy our last meeting, individually I never despaired, and you will remember that I said, "I apprehend nobody expects that corn will long continue at the present low prices: such an expectation would be contrary to all our historic evidences of fluctuations." And I also said, "No doubt, whatever the price of food may be, the land of this kingdom will continue to be cultivated; no one can seriously suppose for a moment that the large and active population of this kingdom is to be unemployed or unfed." These were bold assertions with wheat at 40s., but wheat now at near 80s. proves me to have been a true prophet. In taking a general review of the position of British agriculture, there is, in my opinion, nothing so fatal as congratulations on our past progressions. A good mariner looks ahead, referring to the past only as a caution for the future, as he leaves behind the shoals of error and prejudice; let us do the same in agriculture. So long as it continues so far in the rear of perfection, I can only excuse it, I cannot praise it. These are stirring times: in commerce, arts, and manufactures, the grand invention of to-day becomes old-fashioned and out of date to-morrow; new chemical processes may cause an immense and costly manufactory to be sold for its old materials; witness our sugar refiners, &c. The clipper ship and winged and tailed steamers (combined screw and paddle) condemn their log-like competitors to inferior uses and diminished values. So it will be in agriculture. Mr. Mechi is a most inconvenient person: he can't let old things or old prejudices alone; he is always agitating, and lets all the world know it too. The old flail was superseded by the horse-gear thrashing machine, and now the horse-gears are "trembling in the balance" by that inconvenient new-comer, steam. Then there's the new American thrashing machine—why, by Mr. Mechi's saying so much about it, it has suspended all the orders and bargains that were about to be made in old thrashing machines all over the kingdom. Now, I don't wonder at this; for I assure you it is an implement that will supersede all ours in cost, utility, lightness, durability, and general economy. But for all that, I have a "crow to pull" with your Yankee friends. Would you believe it, they brought over with them horse-gear to work their machine, and tell me that their "cute agricultural friends in the States" are universally "minus steam." Of course, I felt much shocked, and having attached a small portable steam-engine of four-horse-power to show them the advantage over a relay of eight horses, they felt duly ashamed, and promised never again to permit horses to work their excellent machine. I am concerned to see that

still so little steam is used in our own agriculture. Every farmer with two to three hundred acres, who has not an engine, has a great lesson to learn, and I would have him to understand that a strong four-horse power steam engine, worked at 70lbs. to 90lbs. to the inch, will tire any 16 real horses he can find, the comparative cost being £150 against £600, besides cutting nothing when not at work, occupying less space, and economizing an immense outlay in casualties by disease, cost of attendance, and daily fuel—six to seven hundred-weight of coals, versus 32s. horse feed. I little thought, seven years ago, that I should outlive the storm of ridicule and censure poured upon me by my practical friends. But it is gratifying to me, on personal and public grounds, to find the Mechian medicine gradually taking effect. I have often to "congratulate" my neighbours with sly gravity on their steam engines, spannet horse hoes, covered yards, boarded floors, and drainage of tenacious clays; waggons and board and thatched buildings are still clung to with considerable affection, but with a somewhat doubtful and half-calculating glance at my new-looking brick and slated buildings, although erected ten years since. If I meet the strong tea half a mile in advance of the farmery, after a heavy rain, and make some inquiries as to the condition of the tea leaves in the yards, glancing at the untroughed eaves, I am told "My landlord ought to do this;" and sometimes I say, I suppose you would repay him interest for it? In fact, however unpalatable and unpopular it may be to uncover and expose agricultural errors or shortcomings, time convinces me that it is attended with the happiest ultimate results, and I can never afford to feel angry at former censures, when I see that many a sturdy old pollard has bowed to my influence, and that many a crooked hedge and way have been made straight by my example. By-the-by, is it not very singular, that whilst our railway fences are efficient, trim, and thriving, it being possible to dig beside them annually, the lineal influence has never affected the inefficient monstrosities that diverge from them at right angles? I now proceed to produce my balance-sheet, and I am sure most of you will rejoice with me, that it shows a most favourable and encouraging result, the benefit I derive for this year being, in rent, profit, and interest, nearly £600. I will say nothing of a further sum I ought to claim for improved condition of soil, owing to my having purchased for consumption by my live stock, £700 worth of corn, oil cake, &c. I shall have the benefit of this in next year's crop. The balance-sheet is as follows:—

Dr.		
To valuation, October 31, 1852—		
Horses	£86	0 0
Pigs	117	2 6
Sheep	203	6 0
Cattle and Cows	347	0 0
Implements	390	12 0
Tillages, hay, &c.	526	10 0
	<hr/>	
	£1,670	10 6
Rent of chapel laud	45	0 0
Tithes, rates	68	0 0
Labour, including engineer, bailiff, &c.	407	0 6
Guanó, bones, and superphosphate of lime..	98	0 0
Seed corn and seeds	45	0 0
Live stock bought	1,280	0 0

Corn and cake bought for feeding purposes, horses' keep, &c.	648	0 0
Costs for engine, tradesmen's bills, &c.	130	0 0
	<hr/>	
	£1,391	10 6

My improved rent, 36s. per acre	£240	0 0
Profit	343	16 3
	<hr/>	
	583	16 3
	<hr/>	
	£1,975	6 9

Cr.		
By valuation, October 31, 1853—		
Horses	£74	0 0
Pigs, &c.	255	6 0
Sheep	418	0 0
Cattle and Cows	239	10 0
Implements	390	12 0
Tillages, hay, &c.	471	18 9
	<hr/>	
	£1,879	6 9

Wheat, 3½ quarters per acre—50 acres	630	0 0
Barley, 5 " " " 11 "	114	0 0
Beans, 5 " " " 13 "	145	0 0
Oats	10	0 0
Produce of cows and poultry	50	0 0
Hay sold	25	0 0
Horse work, labour, hay, manure, &c., for private establishment	69	0 0
Live stock and wool sold	2,002	0 0
Three stocks of old straw	30	0 0
	<hr/>	
	£1,975	6 9

Cr.		
By valuation, 1852		
Corn, cake, and feeding stuffs bought	648	0 0
Live stock bought	1,280	0 0
	<hr/>	
	2,681	8 6

Profit, or rather price paid for produce of farm	337	7 6
	<hr/>	
	£3,018	16 0

Dr.		
By valuation, 1853		
Live stock and wool sold	2,002	0 0
	<hr/>	
	£3,018	16 0

I recently received a brisk agricultural censure for stating that "live stock is a necessary evil." We cannot do without it, because it produces manure, which enables us to sell grain; but, leaving out of view its natural gain, it certainly "does not pay." Those who have a fancy for keeping pigs and other animals will find that, after paying market prices for their food, adding shelter, attendance, and casualties, there will be a considerable loss, or charge against the manure. If you have a fine crop of turnips, which, in rent, manure, labour, &c., has cost you £10 per acre, and offer it on the market to be folded off for sheep, it is a great chance if you are bid £5 per acre; and if the parties give their sheep oilcake whilst so feeding them, they would probably give nothing for the turnips. These questionous puzzle amateur farmers, but are well understood by the knowing old practical hands. Therefore, bear in mind, that every pound you spend in purchased food diminishes the value of your root or green crop. My stock balance-sheet results very satisfactorily compared with my last, owing to irrigation; but had I not consumed so much purchased fuel, it would have been now far more favourable, although I should have been minus much manure, which may compensate me hereafter. A Lancashire farmer told me a few days since that a fine crop of turnips, which cost him £10 per acre, he once sold for 10s. per acre, to be fed off with sheep. This was owing to the general abundance of turnips, and the necessity for feeding them off in time for barley. The £9 10s. per acre loss would evidently become a heavy drag or charge on the barley, clover, and wheat of the rotation. Another grazier

told me, "If I buy £1,000 worth of oilcake, I charge half to the bullocks and half to the manure." Mr. Lawes's experiments on the comparative fattening qualities of sheep, in the Royal Agricultural Society's *Journal*, furnish correct data on this subject, and show that, after paying for purchased food, nothing was left for the turnip, although we know they cost 10s. per ton or more. Breeding stock of first-rate quality, if you have judgment and suitable land, is perhaps remunerative, although there are many expenses and anxieties attending it. As there is a great rage for poultry just now, it may be as well to say that I include them in my observations. In a farm-yard they are useful to pick up and convert the unthrashed grain; but if you buy food for them they entail a loss. Amateur farmers will do well to consider that 10 per cent. on capital, or £1 per acre, is on an average of years considered a fair remuneration by farmers. It is true there is house-rent free, besides some other advantages; but we see a great many ruined by farming, either from want of judgment or by unpropitious seasons. In farming, as in all trades, a want of judgment is soon found out, and availed of by knowing hands, who will buy of you too cheap and sell to you too dear. Your labourers, too, will take an exact measure of your capabilities. Now, sir, this balance-sheet opens up a vast question for reflection, both in town and country. Why is it so different from my former one? Principally because I have the power of irrigation. It is true that prices are higher now than then, but crops are less productive, and expenses are higher. Nearly the whole difference between this balance-sheet and the former one arises in a live-stock account. By irrigation I am enabled to double, if not triple, my green and root crops, and thus render them profitable instead of unprofitable. It is quite clear that if I can double my stock I also double the quantity of my manure, and thus affect importantly the cereal crops. If I double my green and root crops, I diminish their cost one-half. This is actually the fact, and therein is my present and most agreeable position. Every practical farmer knows that the losing part of his farm is the root crop (I mean in the midland, southern, and eastern counties, where we have hot summers and no rain). That root crop costs him more than the animals repay, and leaves a heavy charge on the ensuing grain crops. Irrigation changes all this, and permits each crop to be responsible for its own annual charge, thus rendering them all remunerative. I am forcibly and frequently reminded of the truth of this statement by a five-acre pasture opposite my residence. Vainly did I try, by solid manures, to render this vile plastic clay into a useful pasture. It was like bird-lime in winter and cast-iron in summer—poor, indigenous, and drab-coloured grasses choked and eradicated the finer kinds I had sown, and the animals wandered about, hollow and dissatisfied. In the space of 18 months irrigation has changed all this—new, fine, fattening grasses have clothed the field with perpetual verdure; it keeps three times as many animals, and the close and shaven pasture indicates their affection for it; butter, milk, and cream, alike testify by their richness to the fertility of irrigation, whilst the animals are improved in their condition. Professor Way, in his recent valuable analysis of grasses, in the *Royal Agricultural Society's Journal*, has revealed the astounding truth, that irrigated grasses contain 25 per cent. more meat-making matter than those not irrigated. We all know that grasses are voracious drinkers—they cannot stand drowning on undrained land in stagnant water, from which their roots soon extract all the oxygen; but see how prim and green they look beside any trickling rivulet. I venture, therefore, to predict that the people of this country will soon connect ample water supply, cleanliness, and health, with the idea of ample and cheap physical sup-

plies—they will identify the well-washed contents of their closets with rounds of beef, saddles of mutton, big loaves, and rich milk. The ladies, whom I am too happy to see here tonight, knowing their great and proper influence, will recognize in every slop that leaves the house, a rich, cheaper, and more abundant supply of that abundant element, milk, which is to develop in their offspring by bone and muscle, beauty and power, mental and physical. In these times of advancement and common sense, let us call things by their proper names. The light of science has dispelled the darkness of our ignorance on these subjects. We know by our great chemists, that our sewers contain the elements of our food—of, in fact, our very selves—and that to waste them, as we now do, is a cruel robbery on the welfare and happiness of our people. Practical experience has taught me that this sewerage is all the better for ample dilution—that the more you flood your cities with limpid streams, washing from every tainted and poverty-stricken court and alley the elements of pestilence and suffering, the grateful earth will absorb them in her bosom, and return them to you as treasures of health and strength. I feel strongly that the time is come when the sanitary condition of two millions and a half of people can no longer be held in abeyance by paltry vested interests. We have in this country an estimated 15,000,000 acres of grass land. We know full well by our London milk, and by the appearance of the pastures on our London clay, that they require and are capable of enormous improvement. This can only be profitably done by draining them and saturating them to the depth of the drains with the sewerage of our towns and cities; this is already in a few instances being done, and will result in enormous profit to those far-sighted men who have anticipated the general adoption of the system. The difficulties are insignificant; they exist in the brain, not in the fact. It is of no use to send a stream of sewerage to a farmer who allows his own manure to run down the ditches, and sends to Peru to get it back again in the shape of birds' dung at 10l. per ton. No; landlords, and tenants too, must be taught or brought to believe that food and liquefied manure are one and the same thing, merely altered in form. Then you may make a small well by the side of each present sewer, and with your steam force-pump take all that comes down that source, and distribute it through subterranean arterial pipes on the whole country; not a drop need run past your pump to taint your streams. There is no more difficulty in it than in the water supply; but you must work a change in the minds of the agriculturists, or they will hardly take it as a gift, much less pay you for it. Our General Board of Health has done wonders in this matter. I, for one, shall ever feel that the country owes to the philanthropic, talented, and energetic members of that board a deep debt of gratitude for their exertions in a most unthankful and unpopular cause. We none of us like physic, however good it may be for us; and sanitary doctors are no favourites with ratepayers, although they can clearly have no other interest than the public welfare. When I speak of liquefied manure, I must be understood as meaning all excrementitious matter, solid or liquid, rendered fluid or semi-fluid by the addition of water, or by decomposition in water. In dealing with large quantities of such decomposing matter, a disagreeable and unhealthy effluvia will arise, however small the trap or cover of the tank; but experience has at length taught me that a jet of waste steam admitted into the tank above the agitated mass of putrefaction effectually prevents any noisome odour. Vain are all other fixers or antidotes compared with this cheap and simple remedy. The effects of liquefied manure are so striking in improving our crops that the cause is worth

tracing. We know that there is nothing of which a farmer is so much afraid as the subsoil six or seven inches below the surface; if he brings this at once to the surface, he will grow nothing for some time. This proves clearly that that dreaded subsoil has never received, or been improved by the solid manure ploughed into the surface soil; but by applying the solid manure in a liquefied form, it sinks deeply into the subsoil, saturating every granule, and by a thousand affectionate affinities improves its chemical condition, rendering its particles available and agreeable to the fibres of plants; change of air, and change of water, are as necessary to roots of plants as to living animals; all this is effected by drainage and irrigation. It is no uncommon thing for us to saturate the soil to the depth of five feet in the very strongest clays, making the drains run with the precious fluid, diminished of course in strength and value. The specific gravity and temperature of liquefied manure are much higher than those of ordinary water, thereby warming the cold and inanimate subsoil—we know the effect of bottom heat in our gardens. It is a significant fact that the liquid excrement of animals in dry weather destroys vegetation; dilute it well, as in our sewers, then it simulates and fertilizes. If we believe that chemical action is the parent of heat, and that it is also electricity, it is easy to comprehend that great chemical disturbances take place in the cold subsoil, by the introduction of manure in a liquefied and fermenting condition; and, consequently, there must be a much greater amount of bottom heat. This is actually the fact; for the irrigated grasses, both natural and artificial, retain their verdure through the winter, whilst those unirrigated have a brown, withered appearance. Experience has taught our farmers that the ammoniacal portion of our manures is the most costly, and yet the most difficult to retain. Owing to its extreme volatility, admixture with water is the only profitable way to prevent its escape into the atmosphere; therefore, the washing away of the fresh-made manure into a copious tank for irrigation is in every way a great economy and advantage. Science has taught us that the earth is as necessarily a composition of plants as air, water, and manure. It has also recently been shown by Mr. Way's experiment, as recorded in the *Royal Agricultural Society's Journal*, that nothing will dissolve the silica, or hardest part of our earth, so readily as ammonia. Hence the necessity for its economy, if we are to grow grain crops more frequently and abundantly than we used to do; for, as you are no doubt aware, the glass coating on the straw of our cereals is a solution of silica, which is necessary, not only as a mechanical support, but as a protection to the vitality and circulation of the juices of the plant. I really believe that many of our spongy laid cereal crops may be traced to a want of soluble silica, the ammonia that should have dissolved it having escaped during the wasteful process of dung-heaps, or been washed away by the rain from the unroughed farm buildings. As this is a general discourse, I will not overlay it with tedious statistics of cost, but will state generally that, to irrigate a farm of 200 acres, you would require four-horse steam power, worked at 60 to 70 lbs. per inch; 15 yards per acre of three-inch iron pipe; a circular tank, about 30 feet in diameter and 20 feet deep; 200 yards of two-inch gutta percha hose, with corrugated joints to render it flexible; gutta percha jet; a pair of force pumps, capable of discharging 100 gallons per minute. (Mine are of five-inch diameter and twenty-inch stroke, making 30 strokes per minute; but I would recommend larger barrels and a slower action, to prevent wear and tear). At present prices, all this can be accomplished for about £6 per acre; so that the tenant paying 9s. per acre to his landlord for such an improvement, would be a great gainer. For more comprehensive details of the whole system, I would refer you

to the excellent "Minutes of Information of Sewerage as applied to Agriculture," issued by the Board of Health, and obtainable at the Queen's printing-office, which every one interested should read. It is a curious and interesting fact, that while solid manure breeds animalcula, liquid manure destroys them. Many fields of tares have been eaten by slugs this autumn, and so would mine but for the discomfiting ammoniacal shower. The losses by wire-worm and slug are very serious, and are well worth preventing. The question of economizing the sewerage of our towns and cities will soon force itself upon our landowners and agriculturists. Admiral Moresby's recent announcement that the guano supply will be exhausted in ten years, will bring the matter to a crisis. Our annual supply of 260,000 tons may be said to produce 2,000,000 quarters of corn, or its equivalent in meat, &c.; with an increased population, such a deprivation will compel us to look after our own guano. The waste of manure, and many other of our agricultural shortcomings, arises from a want of knowledge. The more landlords and tenants understand the science of agriculture, the better will be their practice; and I regret that there are not yet, in each county, one or more agricultural colleges, on the principle of that excellent institution now so firmly established at Cirencester. We find, in many of our midland and southern districts, agricultural reform administered by Scotchmen—because their views are more enlightened by scientific education. While touching on irrigation, it may be useful to consider drainage, with which it has a close connection. Of course, without drainage, natural or artificial irrigation would be injurious. A smart discussion has recently been carried on, whether drains should cross the slope angularly, or follow the natural fall in equi-distant lines. There can be no doubt as to the necessity for tapping sand or peat pots, or other natural and free receivers of water, when surrounded by tenacious clays. Up-and-down drains will generally do this, but, where they do not, lateral branches may be added. Although close and shallow drains may make the land appear somewhat more dry during winter, the crops on the deeply drained land show a superiority in the summer. As so dense a fluid as liquefied manure will filter deeply (five feet) through the heaviest clays, and flow from the pipes in streams, I hope we shall never again hear the too common assertion that "water won't go through our soils." I place before you the model of a steam cultivator, which I think is about to introduce a new economy in British agriculture. I have become as it were a parent to it against my inclination. Mr. Romaine is the intelligent inventor. It was assigned to me by the agricultural department of the Canadian government, who had a high opinion of it. After trying in vain to interest some of our implement makers in this invention, I found that it would be lost to agriculture unless I advanced the necessary funds for its manufacture, and for the securing of the various patents. On public grounds I did this, and I am happy to say that its success promises all that the inventor anticipated. If, with the assistance of a pair of horses and 5s. worth of coke, we can effectually comminute and entivate 10 acres per day, we may bid farewell to the whole tribe of tormentors, scarifiers, grubbers, harrows, broadshares, and clod-crushers, that consume, through our horses, so much of the food of this country. If it does not supersede the plough, it will limit its operations. When once the steam cultivator is shown to answer, no doubt many others will appear; and I venture to predict that, within seven years, steam will become the grand motive cultivating power. I also exhibit drawings of Mr. Usher's steam plough; great credit is due to that gentleman, and I trust and believe it will answer his expectation, and be a great agricultural economy on level land. You will perceive by the models and drawings,

that each of these implements may be compared to a steam vessel on land instead of water. The internal steam power causes the paddles of the wheel cultivators to revolve against the earth, and the resistance offered by the latter to the power exerted causes the machine to be propelled. You will also see that Mr. Romaine's machine will, if required, deposit the seed and roll the land at one time. These may be called dry-weather implements. Every heavy-land farmer will easily appreciate the advantage of being able to complete his cultivation during the long and bright days, when the land works and admires well. Steam, which never tires, will enable him to do this; and he will no longer be pained by seeing his exhausted horses brought home at two or three o'clock in the day, deferring his cultivation until the rains and fogs of November convert his aluminous clays into putty or bird-lime. If these machines answer, I see no reason why they should not be made sufficiently powerful to do 30 or 40, or even 100 acres per day. I have no doubt that we shall see on our land what we now see on the wide ocean—monstrous moving volcanoes rendered by science useful and subservient to man, each presenting the powers of some thousands of horses, which we shall feed with coals instead of corn. Adieu, then, to small fields and narrow lanes. I would state that Mr. Romaine's engine, when not cultivating, will be available for driving the thrashing machine, mill-stones, irrigating pump, chaff and turnip cutters, cake breakers, &c., requisite on most improved farms. It is also intended to work a reaper at harvest. As it is highly important to concentrate great power with little weight, I have adopted Mr. Barran's patent cupped boiler; which presenting a much larger area of fire-box surface to the water, economises fuel by a much more rapid generation of steam. I have no doubt we shall soon find it applied to locomotives. The one I have is the first that has been issued; I have proved it to 270lbs. per inch, and shall work it at from 100lbs. to 140lbs. To appreciate the great advantage of steam over horse power, we must reflect that an express engine, weighing 38 tons, represents the power of 1,000 real horses, which would weigh 750 tons. It is gratifying to me to be able to state that my engine-driver is one of my farm labourers, who works the engine, irrigation pumps, and other machinery, perfectly to my satisfaction. The fact is, all the men on this farm soon get used to the steam, and you may easily select one or more with a particular pride in the management. A forge hammer, anvil, vice, tongs, flat and round files, &c., are a necessity of the situation; so you make a blacksmith, as well as engine-driver. We can many of us remember that nearly all our great inventions have had to struggle into public favour against an amazing force of custom or prejudice. Steam power, gas, steam travelling by land and by sea, and the electric telegraph, were all declared impossibilities and absurdities: even now, fifty years have not sufficed to impress upon the agricultural mind the great economic fact that steam is cheaper and more profitable and available than horse power. There is a great advantage in prejudice or attachment to old and tried customs; but it becomes hurtful when it blinds us to the superiority of novel excellence. In conclusion, permit me to say that a dense, prosperous, and increasing population, spread over a limited and unextendable area, demands, and will necessitate, a more extensive and productive practice in agriculture than is now generally adopted: the investiture of more knowledge, capital, skill, and progression, both on the part of the landlord and tenant, has become a necessity of our times. Our labourer must be educated somehow; our country blacksmiths must become engineers, capable at any rate of comprehending and repairing the defects of our engines. Mighty and restless steam, which is forcing its way into every village, and disturbing rural

placidity, will awaken and command reflection, and develop intelligent action. The walls of our village schools (where we have any) will soon exhibit for the precocious aspirant to steam management, diagrams of the mechanical intellectuality of that universal agitator. We must follow our Scotch friends at a respectful distance in this respect, for there every farmy protrudes its shaft as a sign of the intellect developed by that wise law, which afortime compelled the heritor or landowner to educate the people on his property, and had thus fixed in their breasts that love of knowledge, for which our cannie friends are so distinguished. Landowners have now no excuse for want of capital: eager and intelligent companies, duly legalised, will cheerfully effect, with their subscribed capitals, every agricultural improvement in a manner advantageous alike to the landlord, tenant, and nation at large. Happy, indeed, is it that such operations promote the national tranquillity by employment, and create new consumers for the increased produce, both of agriculture and manufactures. But before all the improvements necessitated by our altered condition can take place, there must be a thorough reform of our present absurd, clumsy, dilatory, and costly mode of transferring land. I really believe it would benefit gentlemen of the law, for now (and I speak practically in this matter) a man of business avoids land, except as a permanent investment; or if he does purchase, takes especial care to avoid a separation from it as long as possible. I purchased the other day three acres of land that intersected my fields, and was highly amused at the production of a mass of parchments and documents as, when spread out, would cover the great charity dinner-table at the London Tavern. After travelling back seventy-five years to trace the enclosure or kidnapping of this piece from a heath, it traced the death of the parties, their wills, their successions, three or four mortgages several times transferred, and a mass of writing out of which any clever lawyer could, I should think, extract fifty objections. Apply the same principle to our funded and every other description of property, and we should come to a dead fix, like the Irish encumbered estates. Like those, the very absurdity of the evil will, I fancy, some day work its cure. It certainly keeps down the price of land, by greatly diminishing the competition for it. If, as I believe, such meetings as these tend to reflection, comparison, and amendment, for the general welfare, I retire from you, satisfied with having contributed my mite towards the good cause of agricultural improvement.

During the reading of the paper Mr. Mechi referred to models and drawings of the machines alluded to, and explained what he considered to be their relative merits.

The CHAIRMAN having invited discussion upon the subject,

Mr. VARTY said, as a great deal had been said about deodorizers in Mr. Mechi's paper, he wished to know whether he had tried chloride of zinc, which was highly poisonous, and therefore, in his opinion, ought not to be used.

Mr. MECHE had not tried it, but he found the best deodorizer to be water with the jet of steam always playing on his tank.

Mr. CHESTER said, at the East Surrey Union Industrial School, near Annesley, more liquid manure had been produced than could be used, and it had accordingly been allowed to run to waste. This created a nuisance in the neighbourhood, and the Brighton Railway Company threatened to bring an action; but the nuisance was stopped by filtering the sewage water through peat charcoal.

Mr. MECHE begged to remark that, though the water might be deodorized by that process, it did not lose its valuable manurial properties.

Mr. COOPER wished to know whether Mr. Mechi had tried the application of the silica of soda to the land. It might, he believed, be obtained very cheaply.

Mr. MECHE believed the great difficulty would be that, when exposed to the atmosphere, the silica would become a solid body.

Mr. WARREN believed it would not do so as now prepared. It was at present extensively used in preparing calico for the dye-tub, instead of cow-dung and water, which had been formerly employed.

Considerable discussion ensued, in which the necessity of

giving a better education to the people than at present was strongly insisted upon; and

Dr. LYON PLAYFAIR said there could be no doubt that Mr. Mechi was now applying his manure to the land in the proper and natural manner, and the more it was diluted the better, as the plants lived by suction, and not from solid food.

The discussion terminated with a vote of thanks to Mr. Mechi, the majority of the speakers expressing their approval of the practice of that gentleman, though they generally guarded themselves from giving any opinion relative to the accuracy of the balance-sheets.

SCOTTISH AGRICULTURAL STATISTICS.

(FROM THE TIMES.)

We have the pleasure of laying before the public the result of the first experiment in obtaining agricultural statistics. It has been conducted by the Secretary of the Highland Society of Scotland in three Scotch counties, where the facilities for making the inquiry are unusually good. Haddington and Roxburgh are famed for the intelligence of their farmers, and Sutherland is held either by large sheep farmers or by small cotter farmers in groups, where they are under the cognizance of their landlord's agent. In Mr. Hall Maxwell's letter, in forwarding these returns to the Board of Trade, he says:—

"The machinery employed in obtaining the estimates was simple, and proved efficient. In every district there was a committee, composed of the enumerator and of experienced farmers selected from and representing each of the associated parishes. The nature and object of their services were explained in a circular addressed by me to the members of these committees before harvest. Their attention was called to the standing crops; and they were requested to institute inquiry and obtain information within their respective parishes. Their observations were continued during the progress of the harvest; and, at a later period, when experiments in thrashing and weighing had been made, the committees were convened by their enumerators, the views of the members were compared and considered, and a statement was prepared and forwarded to me, showing the average acreable produce of each parish, in bushels of grain and tons of roots.

"It is my duty to report to my Lords that I experienced in every district the utmost anxiety to forward the object in view in a thoroughly faithful manner. The communication I have had directly with the enumerators warrants me in making this statement as to them; and they concur in representing the alacrity and good feeling with which the members of their respective committees co-operated with them."

From this it will be observed that the returns are an estimate prepared by experienced farmers from each parish under the guidance of an enumerator for a district, the number of acres under each crop having been previously ascertained from printed schedules sent to every occupier of land. The representative farmer from each parish and the enumerator, in consultation, then put down opposite the various heads what, from inquiry and observation, they believe to be the average produce of each parish per acre, and that multiplied by the acres under the various crops gives the result obtained. By this it appears that the gross produce of wheat in two of the most fertile counties of Scotland is this year only 64,546 quarters, or something less than the 300th part of the annual consumption of the United Kingdom. The gross corn produce of the three counties is 485,133 quarters, or little more than 100th part of what is reckoned to be the average home growth of Great Britain.

The cost of obtaining these returns is not yet before us, but at the estimate of £800, which, we believe, was the sum authorized by Government for the experiment, the cost of obtaining similar returns on the same principle for Great Britain would amount to £80,000. We believe that a much less ex-

pensive and more accurate system could be devised, and it is very doubtful whether the plan of the Highland Society, however successful in Scotland, will be found at all practicable in the English counties, where the land is so much more subdivided and intermixed.

The results obtained, however, are very instructive, and, as a first experiment, highly creditable to the skill and industry of Mr. Hall Maxwell. The average of each crop in two such fertile counties as East Lothian and Roxburgh are probably lower than some would anticipate:—

Counties.	Wheat	Barley.	Oats	Beans	Turnips	Potatoes
	per acre.	per acre.	per acre.	per acre.	per acre.	per acre.
Roxburghsh	24	35	36	26	15	5 14
Haddington.	26	42	45	27	12½	5 13
Sutherland..	32	34	30	13	16	6 18

But if we add the estimated deficiency in the wheat crop caused by the season, 6 bushels in East Lothian and about 8 in Roxburghshire, we have 32 bushels for the first county and 30 for the second, which is a very high average over a whole county, and probably higher than that of any other two counties in the kingdom.

We have compiled the following table to show as nearly as possible the proportion of ploughed land in Haddington and Roxburgh under the several crops:—

	Wheat.	Barley.	Oats.	Beans.	Potatoes
Haddington	1-7th	1-8th	1-6th	1-22nd	1-22nd
Roxburgh	1-28th	1-10th	1-5th	1-90th	1-100th

By a further calculation, taking the present prices in the Edinburgh market, it appears that the average value per acre of the corn and potato crop in Haddington is £11 6s., while that of Roxburgh, at the same scale of prices, is only £7 19s. This very great difference will be accounted for by a careful examination of the above table, which shows that the soil and state of cultivation in East Lothian enable the farmer to raise chiefly those products which are used *directly* as the food of man—viz., wheat, barley, and potatoes; while the land in Roxburghshire is used in much larger proportion for the production of crops for the feeding of live stock, and *indirectly* for the food of man. An increase of 40 per cent. in the value of the gross produce is thus shown to be the result of a more garden-like system of cultivation, a mode of farming which railways and increasing population are every year extending.

On the important question as to the extent of the deficiency in the crops of the past harvest these returns throw very little light. From the two wheat growing counties it is reported that, between diminished breadth and short produce, the wheat crop is at least one-third deficient. These counties are far above the average in point of cultivation, so that we fear, when the average of the whole country is ascertained, the deficiency will prove still greater.

ESTIMATE OF THE CROPS IN THE COUNTIES OF ROXBURGH, HADDINGTON, AND SUTHERLAND, 1853.

[NOTE.—These returns are printed by permission of the Board of Trade, but the Highland and Agricultural Society is responsible for their authenticity and correctness.]

I.—ROXBURGH.

DISTRICTS.	PARISHES.										ENUMERATORS.
No. 1.....	Kelso, Smailholm, Ednam, Sproutou, and Stitcheil										John Dudgeon, Spylaw, Kelso.
No. 2.....	Yetholm, Morebattle, Linton, and Hounam										A. B. Boyd, of Cherrytrees, Kelso
No. 3.....	Melrose, Ancrum, Bowden, St. Boswell's Lilliesleaf, Minto, Maxton, and those parts of Galashiels and Selkirk, in Roxburghshire										G. W. Hay, Whiterig, Melrose.
No. 4.....	Eckford, Crailing, Makerston, and Roxburgh										James Robertson, Ladyrig, Kelso.
No. 5.....	Hawick, Wilton, Cavers, Kirkton, Robertson, and Ashkirk										Daniel Mather, Hairrule, Hawick.
No. 6.....	Jedburgh, Southdean, Hobkirk, Oxnam, and Bedrule										John Ord, of Muirhouseclaw, Kelso.
No. 7.....	Castleton										John Jardine, Arkleton, Langholm.

Districts.	Wheat.		Barley.		Oats.		Beans and Peas.		Turnip Seed.		Turnips.		Potatoes.		Mangold.		Carrots.	
	Q.	B. P.	Q.	B. P.	Q.	B. P.	Q.	B. P.	Q.	B. P.	T.	C. Q.	T.	C. Q.	T.	C. Q.	T.	C. Q.
No. 1.....	2888	4 2	16732	1 0	18991	6 2	1509	4 0	10	7 2	5295	0 0	1820	5 0	20	0 0	4	0 0
No. 2.....	1980	5 2	7317	4 0	12515	6 2	437	4 0	0	5 1	3455	19 0	651	5 1	....	....	....	....
No. 3.....	3426	2 2	12110	7 2	42379	4 0	1736	2 0	11	2 0	9953	5 0	1519	0 0	12	0 0	17	10 0
No. 4.....	3028	5 0	14463	1 0	13852	1 0	495	6 0	*0	0 0	6662	10 0	1293	10 0	*0	0 0	*0	0 0
No. 5.....	650	2 0	4698	3 2	14143	4 0	600	5 2	5	5 0	4048	0 0	1078	7 2	....	....	8	15 0
No. 6.....	231	0 2	8437	4 0	21221	1 1	365	7 2	15	0 0	6484	5 0	1462	10 0	82	10 0	11	17 2
No. 7.....	....	....	240	7 2	1782	4 0	3	0 0	1	2 0	2550	2 0	462	10 0	....	....	1	15 0
	14205	4 0	64050	5 3	130797	7 1	5453	5 3	44	5 3	361349	10 0	8287	7 2	114	10 0	43	17 2
Acreeage ..	5181½		14615½		28862½		1642½		43½		23809		1454	20-40	16½		6½	

* The returns of acreage for District No. 4 show a small breadth under turnip seed, mangold-wurzel, and carrot, which was not sown.

II.—HADDINGTON.

DISTRICTS.	PARISHES.										ENUMERATORS.
No. 1.....	Haddington, Gifford, Bolton, Morham, and Garvald										George Harvey, Haddington.
No. 2.....	Peneatlans, Fala, Salton, Humbie, and Ormiston										Henry M. Davidson, Haddington.
No. 3.....	Prestonpans, Traunt, and Gladsmair										D. Wright, Southfield, Gladsmair.
No. 4.....	North Berwick, Aberlady, Athelstaneford, and Dirleton										G. Hope, Fenton Barns, Drem.
No. 5.....	Prestonkirk, Whittingham, Stenton, and Whitekirk										M. Buist, Tynninghame, Prestonkirk.
No. 6.....	Dunbar, Innerwick, Spott, and Oldhamstocks										P. H. Hume, Lawfield, Cockburnspath.

Districts.	Wheat.		Barley.		Oats.		Beans and Peas.		Turnip Seed.		Turnips.		Potatoes.		Mangold.		Carrots.	
	Q.	B. P.	Q.	B. P.	Q.	B. P.	Q.	B. P.	Q.	B. P.	T.	C. Q.	T.	C. Q.	T.	C. Q.	T.	C. Q.
No. 1.....	8218	0 0	16074	0 0	20934	2 0	2342	0 0	18	3 0	43406	0 0	3122	0 0	59	10 0	....	....
No. 2.....	6142	4 0	11527	6 0	14670	6 0	1647	6 0	45	7 2	31084	5 0	1578	15 0	....	....	24	0 0
No. 3.....	7386	6 0	11607	6 0	12249	2 0	2445	2 0	56	7 0	24283	10 0	5296	3 0	118	10 0	446	0 0
No. 4.....	12327	6 0	13775	0 0	17442	0 0	3715	0 0	36	2 0	*36419	0 0	5876	10 0	270	0 0	716	0 0
No. 5.....	9605	1 2	8490	3 2	16729	4 0	3499	3 1	19	1 0	36258	0 0	4176	5 0	127	10 0	90	0 0
No. 6.....	6811	4 0	6145	0 0	12797	4 0	3085	0 0	30	0 0	31704	0 0	3927	0 0	44	0 0	162	0 0
	50341	5 2	67079	7 2	94823	2 0	16734	3 1	206	4 2	23154	15 0	13976	13 0	619	10 0	1378	0 0
Acreeage ..	15339½		12809½		16802		4809		157½		16260		4246½		48½		107	

* In multiplying the acreage by the average of District No. 4, allowance has been made for 30 acres returned as turnips, but subsequently bare-fallowed.

III.—SUTHERLAND.

DISTRICTS.	PARISHES.										ENUMERATORS.
No. 1.....	Assynt, Eddrachilles, and Western portion of Durness										Evander M'Iver, Scourie.
No. 2.....	Farr, Tongue, Eastern portion of Durness, and that part of Reay in Sutherland										Alexander Clarke, Eriholl, Tongue.
No. 3.....	Dornoch, Creich, Lairg, and Rogart										Robert B. Sangster, Golspie.
No. 4.....	Clyne, Golspie, Kildonan, and Loth										C. Hood, Inverbrora, Golspie.

Districts.	Wheat.		Barley.		Oats.		Beans and Peas.		Turnip Seed.		Turnips.		Potatoes.		Mangold.		Carrots.	
	Q.	B. P.	Q.	B. P.	Q.	B. P.	Q.	B. P.	Q.	B. P.	T.	C. Q.	T.	C. Q.	T.	C. Q.	T.	C. Q.
No. 1.....	....	....	2520	4 2	3409	6 0	....	....	....	....	1253	10 0	6651	15 0	....	....	....	....
No. 2.....	....	....	3627	3 0	3674	5 0	....	....	....	....	2420	10 0	4310	2 0	....	....	....	....
No. 3.....	229	4 0	4712	1 0	12425	3 2	140	0 0	1	6 0	1725	0 0	3713	3 2	....	....	5	0 0
No. 4.....	633	6 0	4928	0 2	5327	4 0	5	0 0	....	....	12064	10 0	2623	13 1	....	....	10	0 0
	863	2 0	15797	1 0	24837	2 2	145	0 0	1	6 0	32989	10 0	17298	13 3	....	....	15	0 0
Acreeage ..	217½		3642½		6569½		90½		1		2090½		2506½		....		1½	

ABSTRACT.

Counties.	Wheat.		Barley.		Oats.		Beans and Peas.		Turnip Seed.		Turnips.		Potatoes.		Mangold.		Carrots.	
	Q.	B. P.	Q.	B. P.	Q.	B. P.	Q.	B. P.	Q.	B. P.	T.	C. Q.	T.	C. Q.	T.	C. Q.	T.	C. Q.
1. Roxburgh	14205	4 0	64050	5 3	130797	7 1	5458	5 3	44	5 3	361349	10 0	8287	7 2	114	10 0	43	17 2
2. Haddington	50341	5 2	67079	7 2	94823	2 0	16734	3 1	206	4 2	203154	15 0	23976	13 0	619	10 0	1378	0 0
3. Sutherland	863	2 0	15797	1 0	24837	2 2	145	0 0	1	6 0	32989	10 0	17298	13 3	....	....	15	0 0
	65410	8 2	146927	6 1	260458	3 3	22398	1 0	253	0 1	597403	15 0	49503	14 1	734	0 0	1438	17 2

DECAY IN ORGANIC NATURE.

SIR,—The accumulation of evidence within these few years having, unfortunately, placed beyond all doubt that a rapid change, from whatever cause, is being produced in both the vegetable and animal kingdoms, of which the potato disease was but the precursor, the question, as a whole, necessarily forces itself on our consideration, although an investigation of the latter subject will equally apply to the rest.

In making the experiment, of which I notified my intention last year, on the best size of seed for planting, combined causes have tended to prevent its being so satisfactory as could be wished—my seed, when put away, was wet and dirty, and to protect it from frost, I packed it in straw, in boxes, which I put in my under-ground cellar, also damp; and the consequence was, that when unpacked, most of the seed had shoots of from 9 to 12 inches in length. The excessive rains precluded planting till May, and the blight in the middle of July totally destroyed all the tops; the crop is, therefore, small; but, nevertheless, the seed, when unpacked, was perfectly sound, and the produce is not diseased one per cent., although some of my neighbours, from such land as mine, have realized not more than ten per cent. of good; whilst others have had whole crops so far destroyed as not to be worth digging up. The result, such as it is, the following table will give:—

Rows. No.	Number of seed to the pound.	Produce in pounds.
1	5	22
2	8	21
3	12	19
4	20	15
5	28	18
6	eyes	12
7	mixture 8 to 28	22

The above I consider not satisfactory, since Nos. 1 and 7 produced alike, and Nos. 3 and 5 yielded more than No. 4; and of the eyes (No. 6) it may be remarked that they had also much shooted, and, therefore, had lost more of their strength in proportion to their weight than the rest. This year, however, I have taken the precaution of putting my seed into a brick oven the day after baking, from which it has been taken out perfectly dry and hard, after being in three or four days, and have packed it in boxes with burnt sand and ashes; and next year I shall repeat the experiment, extending it, however, to seed of the size of a hazel nut.

Having already demonstrated the great influence evaporation has on both the vegetable and animal kingdoms, a comparison of this and last year, with that of 1850 and 1851, cannot fail in proving highly interesting.

EVAPORATION.

Date.	1850.	1851.	1852.	1853.
January	3240	4125	4250	5370
February	4200	2995	5730	5850
March	5040	5285	*	7060
April	6240	5970	*	10025
May	9600	10625	*	19225
June	15840	15075	8220	11895
July	14880	12895	18855	9620
August	11515	13530	9740	11285
September	9460	9570	5300	8070
October	5730	5985	4725	4695
November	5010	3380	4150	
December	1385	2640	4775	
Grains. . . .	92140	92075		

The blanks in 1852 are referrible to the removal of my apparatus from London, and the difficulty I had in deciding on a suitable place for it here; but on reference to the growing period of the year, it will be observed that in 1850 and 1851, when there was no blight, the figures are pretty constant, whilst in 1852 and 1853 they are highly fluctuating; and the relative evaporating influence of the air and earth, or their relative electrical condition, will prove no less interesting.

Date.	1850.		1851.		1852.		1853.	
	Insulate.	Non-Insulate.	Insulate.	Non-Insulate.	Insulate.	Non-Insulate.	Insulate.	Non-Insulate.
January	65	265	395	10	150	—	250	20
February	95	200	95	—	55	175	615	95
March	65	340	245	60	*	*	375	20
April	235	320	145	20	*	*	805	115
May	90	365	165	55	*	*	1560	225
June	225	375	290	65	40	170	440	25
July	690	65	280	30	235	75	505	—
August	160	70	180	65	25	165	490	20
September	50	180	—	180	145	10	265	25
October	165	40	110	30	105	35	140	20
November	315	—	20	30	110	55		
December	185	—	125	—	135	145		
Grains	2340	2130	2050	545				

It will be observed that the three first months of 1850 preserved the choleric influence of 1849, and that there is a considerable decrease in the figures of 1851, and apparently a still further decrease in 1852; but in February, 1853, the electrical state of the atmosphere, as indicated by the "insulate" column, rose to a strong breeze, increased to a gale in April, and became a hurricane in May, when it again subsided, although the earth retained its negative state.

It is, I believe, well authenticated, that in all choleric countries, such as Poland, the potato disease prevails only to a very limited extent; and that this year, in England, it has had little influence in the north, whilst it has destroyed the crops in the south. The highest difference ever obtained in April or May, was in 1846, viz., 215 to 75; and this year we had a most extraordinary blight in carrots, also a non-nitrogenous plant; they came up tolerably well in May, but died off by the end of the month; some, however, survived the shock, and attained a decent size, but in these were observed a few cases of rot, possessing all the characteristics of the potato blight. In connection with this great disturbance in the electrical state of the air, I may refer to the general deficiency in the crops, more especially in hops, and to the fact that no honey has been gathered. I had three hives, but lost them all so early as October.

I have a few words to say in reference to the other section of this important question, viz., the ammonia of rain and snow, and the nature of manure, on which latter subject I have made an interesting experiment.

FRANKLIN CONWORTHY,
Author of "Electrical Condition."

Maresfield, Sussex, Nov., 1853.

TRUNK OR ARTERIAL DRAINAGE.

TO PHILIP PUSEY, ESQ., F.R.S., PRESIDENT OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

DEAR SIR,—It is an event of much congratulation that at a period when the very imperfect state of the trunk or arterial drainage of the country has been made prominently manifest by the excessive rain-fall of the last eighteen months, two circumstances should concur to encourage a hope of a remedy.

I refer to the happy coincidence of your again occupying the chair of the Royal Agricultural Society, at a time when the Government has distinctly declared itself willing to advance social and national improvements.

I should not have presumed to step forward in this behalf, had I not, nearly twelve years ago (1842), addressed to you, on the first occasion of your being president of the society, and afterwards published in the *Westminster Review*, a paper on the subject of general drainage, in which were foretold the many evils, now familiar to practical men, of a disorganization resulting from the English-like proceeding of beginning immense operations at the wrong end, and shown, in the present instance in disregarding the fundamental rule of starting all drainage works from the lowest point.

By the various unconnected works of under-draining which have already been carried out, vent has been given to pent-up waters previously dispersed by dribbles and evaporation; silicious and calcareous soils have been covered from saturated masses into vast filters of rapid action; tenacious clays have been compelled to let go their hold of waters hitherto claimed solely by the atmosphere. But it would appear that the only object aimed at, in the operations that have produced these results, has been to get rid of the injurious waters by the cheapest possible course, without any consideration of the fact that water set free above commits injury below, unless it be securely guided to its ultimate discharge.

There is no doubt that the altered condition of surface soils after effective under draining, is opposed to evaporation; and it is equally clear that the more free and open the soil operated upon, the more rapid will be the action of underdraining, and the greater the quantity of water arrested from the atmosphere by the drainage; so that in proportion to the benefit derived by one landowner may another be injured, if accident has placed the property of the one at a higher level than that of the other. That such injuries do result is proved by the disputes and litigation and efforts of retaliation, which are becoming daily more frequent as the present unconnected works gain ground.

But this is not the worst. Legal strife might probably beget a legal remedy; but, in order to avoid such annoyances, shallow and inefficient drainage very often has been carried out in lands approaching the outfalls, under the specious plea of an incapability of improving them without the co-operation of others who either negative such a proposal or remain passive, in order that the first promoter may bear the whole expense of the work; and, with shame be it said, it very frequently happens that the more enterprising landowner, rather than suffer an imperfect finish to disgrace an extensive improvement, has taken upon himself his neighbour's work as well as his own.

All this is radically wrong. As we would cut a single drain, or drain a single field, by beginning at the lowest end of the one, and at the outlet of the other, in order to give freedom to incoming waters, which would otherwise accumulate and stop the work, so should the drainage of the entire king-

dom be conducted. Every part should organize with the whole—the tidal sea with the flowing rivers; the rivers with the main tributary watercourses; the main watercourses with the outfall ditches; the outfall ditches with the outlets of the main underdrains, and the mains with minor underdrains.

Reversing this order of operations, we have launched into a vast expenditure of money in *underdraining*, without any consideration of the general system or ramification of works essential to an effective discharge of the water set free by underdraining.

And how is the remedy to be applied? In the wholesale dealing with all the rivers and streams in the United Kingdom? No. The magnitude of the undertaking is itself a veto to its adoption without much, and perhaps long protracted, inquiry. But there is no reason why we should not carry out the remedial work by continuing the reverse order in which we have begun. Up to this moment the Government have been content to encourage *underdraining* by loan, and must have become acquainted, when dispensing the public money, both with the wretched condition of the outfall ditches, and with the practical want of power to improve and govern them. *It is with the minor tributary streams we should now deal; those watercourses upon which no mill's exist, and with which no peculiar water interests are connected, but which are nevertheless the arterial receivers or waterways of the drainage and surface waters of the higher lands.*

If we wait until the legislature shall pass a general measure for the improvement of mill-streams and main rivers, with all their attendant difficulties, real and imaginary, we may wait until the accumulating evils of disorganization may be past remedy. We are, doubtless, approaching the time when country millers will believe it possible that steam, as a power, is more economical than water; and no time could be more propitious than the present to enter upon that enquiry which must precede legislation.

I would not, therefore, suggest any delay in the investigation of this part of the subject, but I would impress upon all influential agriculturists the necessity of keeping the two objects distinct from each other.

It is not merely the opposition of millers and water owners that will lead to delay. It will be found, even after an Act be obtained, that the engineering difficulties in dealing with rivers, and the heavy cost of effective works, including compensation to millers, will lead to detention, very injurious to the drainage of the *higher lands* which are not in any way dependent on mills and water interests. By far the larger proportion of the corn lands of this kingdom are the higher lands, and are so situate that the minor arteries and outfall ditches receiving the surface and drainage waters are to the mill streams what the ordinary highways and byways are to the turnpike roads; and there is no reason why some general measure should not place these important but inferior waterways under some central jurisdiction, represented by district officers, whose duty it shall be to examine the state and efficiency of any watercourse (not affecting mills and water-rights), at the bidding of any landowner, prejudiced by the neglect of another, and thereupon report the same to the central authorities, who shall direct, after notices have been given and

objections heard, such works of cleansing, scouring, widening, deepening, and straightening, to be executed as they may think proper, with funds raised by their order on the landowners, in shares proportionate to the properties benefited by the works.

As the law now stands (10 & 11 Vict., cap. 38, sec. 14, at seq.) the necessity of giving formal and legal notices—the uncertainty and delay of obtaining a warrant from two Justices in Petty Sessions—the personal annoyance of appearing as an opponent to a neighbour who, peradventure, may be a magistrate himself—the disagreeable process of levying a distress for costs and expenses—and sundry other invidious discomforts and troubles attending the Act, render it practically nugatory. And, after all, the Act contemplates merely the *cleansing and scouring* of existing ditches; no provision is made for widening, deepening, and straightening such as are shallow and tortuous, without which it is waste of money to interfere with them.

By the appointment of a district public officer (who, in fact, would act as public prosecutor as well as engineer for the district) all such objections will be avoided.

In the Inclosure Commissioners there already exists a central

and competent board of appeal and jurisdiction, and it will not be difficult to find active and competent engineers, who will perform the local duties under them creditably to the country and to themselves.

As one greatly interested in the subject of the general drainage, and engaged in various works, I can confidently say that if such powers as I have suggested were placed in the hands of the Inclosure Commissioners, to be carried into effect by the district officers, not only would the under-draining of the country be better executed, but a great number of minor valleys of great fertility, and comprising a vast number of acres of land, would be rendered free from floods, and capable of under-draining, to the increased productiveness of the soil, and the improved healthiness of numerous districts.

I have the honour to be, dear sir,

Your very faithful and obedient servant,

J. BAILEY DENTON,

Draining Engineer to the General Land Drainage and Improvement Company.

52, Parliament-street, London,
November 26th, 1853.

THE AMERICAN THRASHING MACHINE.

SIR,—Allow me to trespass once more on the columns of your paper, for the purpose of making comparison between some of the working parts of the American machine and those of machines of home production.

The American machine consists of a feeding table; a drum and concave, with a screen through which passes grain from the straw as it is first operated on; a flexible platform shaker, or, as it is called, an "open travelling apron," through which are further screened such grains, ears, and chaff as do not pass through the concave screen; screws, conveyers, or worms which convey the screened substances to another screen or open floor made of inclined laths or slats; a common fan or winnower; a tail trough for gathering such substances as will not pass through the wooden screen or open floor, and which are too heavy to be blown over the tail board with the chaff; and another screw conveyor for elevating the tailings and conducting them again to the drum for being again thrashed and again operated on. These parts constitute the American machine.

Beginning with the drum and concave: these will be found a modification of Atkinson's peg drum, which never came into general use, although a fast thrasher, because of its destructive effect on the straw, and the great power required to drive it. Atkinson's patent having run out, had our makers considered it to possess qualities superior to the drums now in general use, it would have been adopted; but such is not the case, and its known defects were apparent in the American machine, on its trial at Tiptree Farm; the papers that reported on the trial alluded to the straw and grain being more broken than is the case with our better English machines. Taking next the flexible platform shaker, or "open travelling apron," it has not been shown to possess any advantage over the platform shaker patented in 1850, either for shaking the straw more effectually or more expeditiously; but it is easy to demonstrate that with two endless chains with upwards of 60 links in each, and each link working on a pivot, there must be a much greater amount of friction, a greater wear and tear, as well as a greater tendency to disarrangement, than there is in the platform shaker, with its two centres or bearings. The screw conveyers come next for consideration; and here I give an extract from a report on the machine and the trial at Tiptree Farm, which appeared in the *Essex Standard*,

and was afterwards copied into other papers:—"The effectiveness of the interior arrangement is mainly dependent upon a skilful adaptation of the principle of the Archimedeian screw."

If such really is the fact, then are the leading merits of the machine embodied in an English patent taken out early in 1852, and which was referred to in my first letter. Lastly, the open floor or screen of inclined slats and winnower have yet to go through the ordeal of a trial with other screens and winnowers.

The lightness of the machine is an advantage; but such advantage is dearly bought, if quality of workmanship and requisite strength of material for durability are sacrificed for the purpose. Gear wheels, which our English makers have fortunately been able to dispense with, are a disadvantage; and with this disadvantage the American machine abounds.

Having now concluded my remarks, and believing that we have machines in this country which will not stand second to the American machine, which have been constructed at as little cost, taking quality of workmanship into account, and which are not requiring more power for working them,

I am, Mr. Editor, yours very truly,

Southwark, Dec. 2nd.

CIVIL ENGINEER.

REVIEW.

EVELINE (A SONG.)

POETRY BY CECIL GREY, ESQ. MUSIC BY H. ROSAMBERT.

Published by Chas. Jefferys, 21, Soho-square.

It is with great pleasure we review this graceful song. The words are extremely pretty, with a sentiment and pathos in the concluding lines of each verse that afford an admirable contrast to the merry light strain in which they commence, and which, by the blending of gaiety and tenderness, gives an indescribable charm. Mr. H. Rosambert has wedded those lines to a delightful air, exquisite in its simplicity and brilliant in its airy grace. It is admirably suited to the words, commencing in a laughing, joyous, carolling strain, and concluding with a slow plaintive melody, which lingers on the ear long after the tones have died away. We feel confident this song will quickly become a favourite; and combining as it does the *allegro* and *penseroso* styles, will form a charming addition to the musical collections of all lovers of sweet sounds.

CALENDAR OF AGRICULTURE.

During stormy and frosty weather, carry dung from the cattle-feeding yards to the heaps in the fields that are intended for the next year's green crops. Slope the heaps at each end, so that the carts can pass over them, and spread the strawy manure evenly over the space; the treading prevents the present fermentation. Carry stones to drains, and for any walling that is intended, and earths to the compost heap, and to the manure pit, for the purpose of absorbing the liquid excrements. Deliver grains to the merchant, carry fuels, and gather all kinds of manures.

In fresh weather, plough stubbles for wheat and green crop fallows; on wet land, open all cuts for the conveyance of water, that it may pass freely into the side ditches. Plough grass lands and young leys for Lent crops of grain; all lands are the better for being early ploughed; clay soils are pulverised by the vicissitudes of atmospheric action, and light lands acquire a consolidation from lying a time in a certain position, which has been found to be of very considerable importance.

The fresh weather of this month affords a good opportunity for cutting hedges, underwood, and copses; for planting young trees; for cutting drains to the half depth, to be afterwards deepened and finished in summer, and for cleaning water courses, cleaning the sides of roads, and carrying the materials to a heap for a lime compost. Sow wheat on any fallows delayed in autumn, and on the strongest turnip lands from which the roots have been removed.

During dry and mild weather, continue to pull and lay in store Swedish turnips in heaps at the homestead; lay them in a longitudinal row, six feet wide at bottom, and about four feet high, with sloping sides, and thatch the pile with drawn straw. Choose a cold situation. Lay in store, in provision against a storm, a quantity of common turnips, sufficient for a month's consumption; keeping beyond that time produces mouldiness.

In every kind of weather, never omit to collect manure; reckon a compost heap a most indispensable requisite on any farm, to which refuse materials of every kind may be carried, and in sheds under cover prepare the artificial manures for the drop-drill. Float water meadows, and lay dry occasionally.

Thrash frequently, that the animals of the farm may have fresh straws for constant use, for provender in the yards, and for being cut into chaff. Move from place to place very frequently the straw cribs in the yards, in order that the dung under-

neath may be made of an uniform quality, and litter often the whole area of the yards thinly and evenly. Bestow the most minute attention on every detail of practice.

Give turnips and other roots to the feeding and store cattle in the yards by break of day, in such quantities as the intended purpose may require, and that they may be consumed by night, in order to prevent accidents by choking when darkness prevents the observation. Wooden cribs with latticed bottoms are best for holding turnips, as the water and muddy filth find a ready escape downwards. A few young pigs are very useful to run loose in the feeding-yards, to pick up the shells and scraps of turnips that fall from the cattle.

Attend most carefully to the state of the milch cows, now beginning to drop calf. The secretion of milk must be promoted by the use of juicy food, as roots mixed with chaff, steamed, in a feed at noon. Suckle all calves, either for weaning or for veal, in three meals a-day; no substitute as food equals the mother's milk.

The sheep in the fields will require a very regular attention in feeding and tending. Give the turnips in a fresh state, daily pulled from the fields if possible; early ewes will begin to drop lamb, and must have ample feeding with juicy food, and sufficient shelter in covered sheds.

Feed bacon hogs twice a-day with steamed roots, as potatoes mixed with meals and bran. The food of brood sows may be thinner and more washy. Store pigs may have the roots in a raw state, and one feed of cooked food daily. Bacon hogs must be finished for sale by a month's feeding with hand corn, as oats and beans, in order to produce the firmness and whiteness of flesh.

The poultry must not be neglected. Feed with light grains, and with steamed potatoes mixed with meal, and placed in troughs under cover of a shelter shed. Poultry houses should be heated below the floor, by means of pipes from the cooking boiler. By this provision, the laying of eggs and the hatching of chickens may go on during winter.

The foremost fattening bullocks, and the early bacon hogs, will come for sale during this month, and will command a ready market at this early season, as the articles are scarce, and a good price will be obtained. This circumstance should stimulate the farmer to have things as forward as possible.

Work horses are much benefited by having one feed daily of steamed potatoes, or other roots, given in the evening, when they return from work.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEAT'R.
Day.	S or		Min.	Max.	10 p.m.	Direction.	Force.	S or 9		10 p.m.	
	9 a.m.	10 p.m.						a.m.	2 p.m.		
Nov. 22	30.32	30.22	27	37	28	W.N.W.	calm	fog	cloudy	fine	dry
23	30.22	30.20	26	34	30	N. Westerly	gentle	fog	fog	fine	dry
24	30.10	29.98	28	39	33	S., E. by S.	gentle	cloudy	cloudy	cloudy	dry
25	30.10	29.98	33	43	42	S., N.W.	var.	fog	cloudy	cloudy	rain
26	29.85	29.98	39	40	40	W., N.W.	var.	cloudy	cloudy	cloudy	rain
27	30.12	30.17	33	39	39	N. by West	calm	cloudy	cloudy	cloudy	dry
28	30.19	30.18	35	44	41	South	gentle	cloudy	cloudy	cloudy	dry
29	30.12	30.0	36	45	45	South	rising	cloudy	cloudy	cloudy	rain
30	30.06	30.10	44	50	49	S. by West	gentle	cloudy	cloudy	cloudy	rain
Dec. 1	30.13	30.11	36	47	36	E. by North	gentle	cloudy	fine	fine	dry
2	29.97	29.93	29	41	31	S. East	calm	fine	sun	fine	dry
3	29.97	29.96	29	38	37	East	gentle	haze	fog	cloudy	dry
4	29.96	29.93	34	42	39	E.S.E.	var.	fog	fine	cloudy	dry
5	29.93	29.93	38	44½	40	E.S.E.	var.	fine	fog	cloudy	rain
6	29.98	30.08	38	41½	40	North	calm	fog	fog	cloudy	dry
7	30.10	30.11	40	43	41	N. East	gentle	fog	cloudy	cloudy	dry
8	30.16	30.27	38	43½	36	Variable	gentle	fog	fog	cloudy	dry
9	30.31	30.35	34½	43	39	N. East	gentle	cloudy	cloudy	cloudy	rain
10	30.31	30.29	35	36	33	East	strong	cloudy	sun	cloudy	dry
11	30.16	30.0	29	33	31½	Easterly	var.	cloudy	cloudy	cloudy	dry
12	29.94	29.78	30	34	31	S. by East	lively	cloudy	fine	fine	dry
13	29.66	29.38	30	44	43	E.S.E.	lively	cloudy	cloudy	cloudy	rain
14	29.22	29.27	36	42	33	East	lively	fine	fine	fine	dry
15	29.27	29.20	27	32	31½	North	gentle	cloudy	cloudy	cloudy	snow
16	29.30	29.55	24	27	22	Northerly	calm	fine	sun	cloudy	snow
17	29.62	29.72	21	33	31	Variable	calm	fine	fog	cloudy	dry
18	29.66	29.53	29	32	29	E.S.E.	rising	fine	fine	fine	snow
19	29.49	29.60	27	33	31	S. East	airy	fine	sun	cloudy	dry
20	29.69	29.86	27	34	34	Variable	v. gtle.	haze	haze	haze	snow
21	29.96	30.0	33	34	33	N. East	gentle	cloudy	haze	cloudy	sleet

ESTIMATED AVERAGES OF DECEMBER.

Barometer.			Thermometer.		
High.	Low.	Mean.	High.	Low.	Mean.
30.320	29.120	29.720	55	17	39.3

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
38.86	32.16	35.51

WEATHER AND PHENOMENA.

Nov. 22, 23, 24 frosty. A change for wet on 24. 25, 26. Rain, chiefly overnight. 27. Damp and hazy. 28. Overcast. 29. Rainy, evening. 30. Warm and drizzly.

LUNATIONS.—Last quarter, 23rd day, 10h. 35m. night. New Moon (the second of the month), 30th day, 7h. 13m. evening.

Dec. 1. Clearing. 2. Rime, and some ice. 3. Dense fog. 4. One clear interval at noon. 5. Sunny morning; then fog, and a shower. 6 and 7. Overcast; no rain. 8. Foggy, but with some gleams. 9. Some rain. 10. More fine, after a night shower. 11 and 12. Cold, calm evening;

hint of show. 13. Mild. 14. Keen eastern current. 15. Much snow. 16. Frosty throughout. 17. Overcast. 18. Gentle frost; wind rises at night. 19. Fine, with gentle frost. 20. Sleet, and some large flakes; thaw all day. 21. Cold, sleety. Sun passes into Capricorn, and it is now mid-winter.

LUNATIONS.—First quarter, 7th day, 0h, 10m. p.m.; full, 15th day, 1h. 34m. p.m.

REMARKS CONNECTED WITH AGRICULTURE.—The period of many weeks' duration has been remarkably frosty; and so as to remind one of the autumn of 1846! The winter is fairly introduced, and, so far, gives promise of snow and frost—though not perhaps of great severity—of considerable duration. Accounts from distant places concur with ours, of the happy condition of the land at this time. It has been well-wrought, and abundantly seeded. The verdure of pastures is beautiful, and the animals feeding thereon on turnips, &c., are, it appears, in sound health. Labourers are employed, and receive better pay.

Croydon.

J. TOWERS.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR
DECEMBER.

Had the last crop of wheat in this country been a productive one, and had we been in a position to meet the foreign demand for food which has lately sprung up, no doubt the supply at this time on hand would have been the most valuable on record. That the present price of wheat is a good one, is evident from the various market returns; but, on the other hand, when we consider the shortness of the yield, and the bad condition in which most of the samples have made their appearance, we may safely conclude that the actual returns to the growers are not so large as they appear to be. The inroads upon the stocks, up to the present time, have not been large, owing to the inferior condition in which they were secured, the necessity of millers purchasing largely of good heavy foreign wheats, to make fine flour, and the prospect of prices ruling firm for several months. Since we last wrote, the trade has been in a healthy state, and the quotations have been steadily on the advance. Spring corn, especially barley, of which article immense quantities have been thrashed out and disposed of, has been in very active request. The quotations are now higher than for several years past, and yet there does not appear to be the slightest chance of any rapid decline in them, owing to the high value of all articles on the continent, and the probability of the imports being on a limited scale. The yield of oats, beans, and peas is turning out most abundant; but it is clear that the great demand for these articles will speedily take off the stocks on hand.

The extremely seasonable weather—in point of fact, we regard the present as by far the finest season we have had for many years past, notwithstanding its extreme coldness—has been favourable for the land. Both ploughing and sowing have, of course, been suspended; but we are glad to perceive that the quantity of land under wheat culture is considerably in excess of any former period. Up to the close of 1852, not one-third of the present extent had been finished for wheat. This argues well as respects the future; though, in the event of good crops on the continent, we may see prices much lower, towards the close of 1854, than at present. Such has been the favourable nature of the season, that close preparations have been made for spring seeding; and we may further observe that numerous farmers have intimated their deter-

mination to sow as much wheat and barley as possible, under the impression that they will prove the most profitable crops. Should the weather permit of these plans being carried out, we must naturally look forward to a decrease in the growth of oats, beans, and peas, which articles will, therefore, rule high elsewhere, owing to an increased demand from this country.

The growth of potatoes in this country, as well as in Ireland and Scotland, has been larger than most persons had anticipated. In Scotland especially the produce is represented as enormous; but we regret to find that they are turning out very deficient in quality. Good sound potatoes have, therefore, sold at high prices, with a brisk demand. The imports from the continent have been very liberal, including large parcels from Sweden. The excess in the importations may be chiefly attributed to distillation from potatoes having been prohibited in several parts of Germany, where, in seasons of abundance, private distilleries were very common, and acknowledged by the authorities. From France the export is still forbidden; but we are of opinion that the measure will not have much effect upon our markets, because we are now able to draw largely from Ireland, which may be considered a new source of supply. From that country nearly 40,000 tons have been shipped since the beginning of November.

The fat stock markets have been most abundantly supplied; yet prices, owing to the activity in the demand, have been rather on the advance, notwithstanding that we have continued to receive large arrivals from the continent for the time of year.

Very moderate supplies of hay and straw—and those in middling condition—have appeared on sale. The demand has ruled steady, at extreme quotations. Meadow hay has realized £2 10s. to £5 10s.; clover ditto, £4 to £6 10s.; and straw, £1 14s. to £2 4s. per load.

Very few transactions have taken place in guano for home use; but several large parcels have sold for shipment to France, Holland, and Belgium. The imports have amounted to about 7,000 tons, chiefly from Callao. We are glad to perceive that the Council of the Royal Agricultural Society are making efforts, through the Foreign Office, to abolish the monopoly in the guano traffic. It is quite clear that an almost inexhaustible supply yet remains on the Chincha islands, and that the opening of the trade would be productive of great

advantages, not only to our farmers, but to the Peruvian Government itself.

In Ireland and Scotland trade in general has been active, and the prices of all articles of grain, including live stock, have been freely supported.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

In reviewing the state of the cattle trade for the past month, many features of interest present themselves. Notwithstanding that the imports of foreign stock have been on an extensive scale, prices in Smithfield, and in the whole of the provincial markets, as well as in Ireland and Scotland, have been freely supported; and an unusually large business has been transacted for Christmas consumption. In comparing present rates with those obtained during the corresponding periods in 1850, 1851, and 1852, we perceive that they are very remunerative, and calculated to give a great stimulus to the production of meat in this country, even though the breeders will have to contend with open ports. It is evident that the quantity of stock at this time in this country is by no means adequate to the consumption, which appears to be increasing to a considerable extent year by year; and that the efforts of the graziers are wholly unable to keep pace with the increased demand. We therefore are of opinion that grazing must long continue to be a profitable employment of capital, and that any material decline in present rates is wholly out of the question. Not that we see any chance of a serious advance in them, because our information from Holland is to the effect that stock-feeding continues to be carried on most successfully in that country, and that the available supplies of both beasts and sheep are now larger than they were prior to the passing of our present tariff laws. The demand for France may divert a portion of the intended shipments to England; but as yet it has had little or no effect upon the extent of our accustomed imports.

From the most careful inquiries made in our leading grazing counties, we understand that the supplies of beasts in the northern districts have exhibited a decided falling off in comparison with some former seasons. The various "strikes" in the manufacturing districts would lead us to the conclusion that the drain upon the Lincolnshire marshes has been small; but it would appear that larger supplies of shorthorns have been forwarded to the south than has been almost ever recollected—not in a fat state, be it understood, but chiefly lean, for the purpose of grazing in Norfolk and elsewhere. The extraordinary exertions made by the

short-horned breeders, of late years, to improve the quality, weight, and condition of their supplies—the result of which is clearly shown from the splendid exhibitions in Baker-street and in Smithfield—have naturally induced breeders in other localities to procure stock of a similar kind; and the introduction of vast herds of short-horns into the eastern counties have been productive not only of great benefit to the land, but to the graziers and butchers, who are reaping the advantage naturally resulting from an improved mode of feeding. We say this without attempting to disparage the exertions of the Lincolnshire breeders; and we may further remark that we have seen finer short-horns forwarded from Norfolk to London than from the best lands in Lincolnshire itself. The present high value of stock, and the prospect of an extensive demand, will no doubt lead to further improvement, alike profitable to all parties.

It is somewhat remarkable that up to the present time the attempts to fatten foreign stock in this country have, with very few exceptions, turned out complete failures, even though they have been made by most experienced parties, some of whom have visited the continent, and had an opportunity of ascertaining the exact kind of food given to the animals, together with the general mode of rearing them. It is evident, therefore, that any addition to our supplies in the pastures and homesteads from the continent cannot be calculated upon. We have observed, however, that the import of cows in-milk from Rotterdam has steadily increased; and, from what we can learn from the cowkeepers who have purchased them, the quantity of milk given has exceeded our usual short-horned breeds. These animals are small in bone, and exceedingly well shaped; and we should not be at all surprised to see them generally introduced into our best dairies.

In Smithfield the supplies of beasts have been extremely liberal during the month; and it is gratifying to observe that they arrived in the best possible condition. As we have elsewhere given a detailed report of the proceedings on the "Great Day," we have only to observe that a better collection was seldom or never witnessed, considering the immense number brought forward, viz., over 7,000 head.

In all parts of the country the stock has been represented as unusually free from disease: but although the carrot and turnip crops have turned out most abundant, the available quantity of dry food—owing to the heavy rains which fell in July, and which completely spoiled the hay in many quarters—is considerably less than in some former seasons. This is to be much regretted, because an abundance of hay is so essentially necessary for

stock, and because it is likely to be exceedingly dear until after the next crop has been carried.

The following are the total supplies of stock shown in Smithfield :—

	Head.
Beasts	23,314
Cows	484
Sheep	88,480
Calves	1,143
Pigs	2,402

Of the above supplies, Lincolnshire, Leicestershire, and Northamptonshire have furnished 10,600 short-horns; the west of England, 2,000 Devons; other parts of England, 4,000 Herefords, runts, Devons, short-horns, &c.; and Scotland, 1,960 horned and polled Scots.

COMPARISON OF SUPPLIES.

	Dec. 1849.	Dec. 1850.	Dec. 1851.	Dec. 1852.
Beasts ..	23,853	24,239	20,554	21,018
Cows ..	442	316	451	540
Sheep ..	119,180	99,944	93,462	86,880
Calves ..	1,413	1,864	1,201	1,898
Pigs ..	2,139	2,619	2,872	2,259

On a comparison with 1852 the supply of beasts has been large; but there has been a slight falling off compared with 1850.

The average prices of stock have ruled as under :—

Per 8 lbs. to sink the offals.

	s.	d.	s.	d.
Beef, from	3	2	4	10
Mutton	3	0	5	2
Veal	3	8	5	0
Pork	3	4	4	10

COMPARISON OF PRICES.

	Dec. 1850.		Dec. 1851.		Dec. 1852.								
	s.	d.	s.	d.	s.	d.							
Beef ..	2	8	4	0	2	10	4	0	2	2	0	4	0
Mutton ..	2	6	4	2	2	10	4	4	2	2	10	5	0
Veal ..	2	6	3	6	3	0	4	4	2	8	4	4	4
Pork ..	2	8	4	0	2	8	4	0	2	8	4	0	0

The arrivals of country-killed meat up to Newgate and Leadenhall have been unusually large, and of very prime quality. The supplies on offer slaughtered in the metropolis have also been extensive; nevertheless the general trade has ruled steady, and the quotations have had an upward tendency. Beef has sold at from 3s. to 4s. 4d.; mutton, 3s. 2d. to 4s. 8d.; veal, 3s. 4d. to 4s. 10d.; pork, 3s. 4d. to 5s. per 8 lbs. by the carcase.

From abroad, the following supplies have reached the metropolis :—

	Head.
Beasts	4,163
Sheep	16,497
Calves	1,143
Pigs	115

	Total	21,918
Same time in 1852		17,870
— 1851		21,594
— 1850		20,435
— 1849		16,368

The arrivals at the outports have been on a very moderate scale. The late gales have been productive of several losses at sea—about 100 beasts and calves having been thrown overboard, whilst on passage from Holland. Although the inland navigation is closed, shipments to a moderate extent are expected to be made during the whole of the winter.

LEICESTERSHIRE.

Though at this season of the year agricultural operations are perhaps more dormant than at any other, still the progress made in the last two months calls for a few remarks. We noticed in our last report, at the end of October, that the wheat then sown was not to a great extent, notwithstanding the lesson which farmers learned in the preceding autumn; that delays were extremely dangerous in this important work; but they were prevented from doing much during the heavy rain which fell in the middle of that month. We are happy to state that, during the favourable weather in the first three weeks of November, great exertions were made to get in the seed, and a very large breadth was sown and went in tolerably well; and, from the small quantity of rain which has fallen in the present month, but little interruption has arisen to complete the latter-end wheat sowing. Though there may become pieces yet remaining intended for wheat, we cannot but express great satisfaction at the termination of a seed time under so many favourable circumstances compared with that of last year; and a larger breadth is now under a wheat crop than for many years past. We hear various accounts as to the appearance of the early sown, which has now been up for some time: many say that the plant is thin, having suffered either from the attacks of vermin, or perished in the ground during the heavy rain in October; but we have observed many crops of early sown, even on clay land, which look exceedingly well, with every promise of success; but the great bulk of the crop has not yet appeared above ground, and it is too early to anticipate the final result. A fair breadth of winter beans has been sown, and we do not hear any complaints respecting them at present. The mild latter end, combined with an abundance of grass in the pastures, has been very favourable to stock, and cattle have done well without a great consumption of fodder. This is a fortunate circumstance, as the Swede turnips are but an indifferent crop, and bad in quality; in fact, all roots in this neighbourhood are light, and go up quickly when stocked. There is an abundance of hay on hand, considering that Christmas is here; but much is inferior in quality, not a little having been flooded, and is not of much value. We think potatoes keep better than was expected, and are less affected by the disease than in previous years; they have declined something in price, still they are dear, 4s. 6d. to 5s. per bushel. We are glad to remark that we hear less of the epidemic amongst cattle, and we think both flocks and herds are in a healthy state. The plough has met with very little interruption during the past month, and where diligence has been practised field work may be justly said to be in a forward state. The price of corn has fluctuated to the extent of about 5s. per qr.; but what was lost in the last few weeks will, from the aspect of the last market at Mark Lane, speedily be regained, as a rise of about 4s. per qr. took place in wheat. Our market on Saturday was very active at an advance of 2s. to 3s. per qr.; good wheat making 80s.; barley, 42s.; and oats, 30s. Notwithstanding this sudden rise, we hope there is no fear of actual scarcity, but any great advance over these prices would certainly give strong indication that such is the case. Much depends upon the foreign supplies; for as we gain further experience, we regret to say, we see no reason to hope better for the produce of the last harvest in this country than we have before intimated. In our last report we ventured to remark that we thought a war between Russia and Turkey would not have the effect either upon the corn market, or the other great interests of the country, which many anticipated. This opinion has proved correct, for when hostilities commenced the funds rose, railway shares improved, and corn fell some shillings per qr. The aspect of affairs is now more gloomy, and if England with her European allies is drawn into the war, it is impossible to say what the effect will be upon the interest of the

agriculturist. In spite of all these unfavourable circumstances we are glad to hear that our local manufactory is in a satisfactory state; and that wool is firmer, and even worth a little more than it was a month back; but there is not a great deal doing in farmers' lots, as there is generally a lull in the trade on the near approach of Christmas; and we trust when the new year opens we may find trade good and wool ready sale, at from 38s. to 40s. per tod. The prospects of the farmer are greatly improved from the close of last year. Corn has advanced from 35 to 40 per cent.; but this is not all gain to him, as he has less of it, and the cost of production has increased. The advance in the price of stock has been a solid advantage to him, and more especially to the breeders, as he finds his sheep and beasts are worth much more, and the extra cost of raising them has been but trifling. We sincerely hope that from the great rise in all agricultural produce, the farmers will be able to recover something of that which they lost for the five or six previous years; and we trust that landlords will be merciful, and not demand too great a share of the increased value of their tenants' produce, but take into consideration their losses in former years. All kinds of store stock is high, though a little decline in the price of sheep has taken place. The best quality of beef and mutton, just at this season, is worth 6½d. per lb, but 6d. may be taken as the average. We are glad to say that our labourers are well employed; the general wages being 12s. per week, for ordinary hours, but many are getting 13s. or 14s., where extra time is required.—Dec. 22.

D U R H A M.

We have experienced a long, protracted, critical, and expensive harvest; it commenced about the latter end of August, and was nearly finished at the end of November in the later districts. The corn ripened remarkably slowly. September was showery, but a good deal of grain was secured in fair condition previous to the 4th of October, when the weather set in excessively wet, and continued, with little intermission, until the 15th, when it cleared up. Only a small portion of the spring wheat was secured, and a great extent of grain was standing out, and sustained very considerable injury from sprouting. We do not remember a season when so much damage was done. Many extensive farmers had not secured a sheaf of their wheat, and being so sprouted and unsound, it is only fit for pigs. As thrashing has proceeded, all accounts agree in describing the yield of the wheat crop to be more deficient than was calculated on at the time of harvest. The prices are certainly remunerative, but they will not compensate the farmer for the injury and deficiency of the last crop. It is satisfactory to observe that a good deal of old wheat still remains, and holders will be amply compensated for keeping it. The new wheats have come slowly to market: the quality and condition are exceedingly various; some samples are fine in quality, and others soft and shrivelled. The weather during the month of November was highly auspicious for out-door labour, and farmers were enabled to make considerable progress in finishing their harvest and lifting their potatoes, and also that most important operation, committing the seed to the ground, which, we are happy to observe, was under most favourable circumstances. We have seldom seen land work better. Large breadths of turnip land have been cleared and sown with wheat, and the seed has also been well got in. Some farmers had sown their old wheat previous to the commencement of harvest: last year taught them a lesson. We think this rather a dangerous system, as it is liable to get winter-proud, and lose plant in the spring months; but the hoar-frosts have checked any premature luxuriance. Barley is considerably above an average crop. An unusual breadth was sown, and it suffered least from the humidity of the season; it is coming to market freely, and malting well. The oats are very various. On free, light soils they are good, and on all strong land they are very deficient. We think they are below an average. Potatoes were very promising until the wet weather set in, in October; since then they are much diseased, but sound ones are selling at high prices. Turnips are quite a failure. Thousands of acres have been destroyed by lice, and what are left are not half a crop. The tops are sickly and yellow, and the bulbs are very small and bear no eating. The hay crop was a very light one, and fodder of all kinds is most deficient. Grass land is bare, and short of keep. Our

Christmas show of fat cattle and sheep at Newcastle and Darlington was very superior, and sold at good prices. Mutton has had a downward tendency at our markets, owing to the shortness of keep. At our hiring for servants this November, higher wages were asked and obtained, which may be attributed to emigration, and the many public works that are now going on in this county: labourers are receiving from 2s. 6d. to 3s. per day, and hands fully employed. The weather is now assuming a very wintry aspect: we have been visited with severe hoar frosts, and stock that have not been taken into their winter quarters, but have remained out in the fields, have lost condition.—Dec. 21.

QUANTITIES OF MALT BREWED BY THE UNDERMENTIONED LONDON PORTER AND ALE BREWERS.

Truman, Hanbury, and Co.....	1842.	92466	90588	94418	108680	112450	101212	108212	105022	110642	118366	112494	140090
Barley, Perkins, and Co.....	1843.	114900	108510	104380	117415	127255	113831	105494	115342	113430	126982	124116	129882
Mearns and Co.*.....	1844.	48340	44026	46467	48940	47080	61487	60276	59617	60802	65117	66206	66509
Reid and Co.*.....	1845.	50120	51880	51205	54290	67500	62700	54520	56040	56380	59350	60100	65480
Whitbread and Co.....	1846.	40184	41706	53292	54442	50048	48618+	51621	51800	51621	52213	52213	—
Combe and Co.....	1847.	29607	42521	42292	44004	51126	42887	44128	43282	45008	48692	47304	—
Hoare and Co.....	1848.	97050	29836	31001	29886	33881	—	—	—	—	33769	33769	—
Elliot, Watney, and Co.....	1849.	30660	29293	27204	28775	32482	30880	31480	29558	30660	32728	32728	—
Calvert and Co.....	1850.	13539	14885	30377	80705	82724	31110	29285	28630	33874	35420	32310	—
Mann, Crossman, and Co.....	1851.	20423	19328	10188	16540	19413	19745	21295	24080	25265	28690	30881	—
Charrington, Head, and Co.....	1852.	19130	19330	21294	16995	23306	21331	22023	22022	25330	26366	26366	—
Taylor, Walker, and Co.....	1853.	17071	16465	18110	18110	17901	18064	17035	15870	15925	16280	17663	—
Golding and Co.....	1854.	17071	16465	18110	18110	17901	18064	17035	15870	15925	16280	17663	—
Conroy and Co.....	1855.	18016	11641	11994	12694	13259	13460	13996	14463	14980	15760	16014	16481
Wood and Co.....	1856.	7652	8004	8401	10892	9463	8829	8863	9773	9286	9920	10300	12414
Tubb, Willis, and Cowell.....	1857.	5503	5865	5364	6418	6520	6640	7080	8015	8296	8605	9015	9615
Amisick and Matthews.....	1858.	—	—	—	—	—	—	—	—	—	—	—	2568

Those marked thus * brew Porter only.

+ 627,188 lbs. Sugar.

ANSWERS TO AGRICULTURAL QUERIES.

CHEMICAL MANURES TO MIX WITH EARTH.

SIR,—It would be no answer to "A Grazier," in your last, to mention night soil, urine, fish, or animal refuse, which do not come within the limits of his question; and chemical and artificial manures, generally, neither produce nor require fermentation. Gas liquor does so, in degree, where the earth contains much vegetable matter, and so does the mixture of lime and salt. Independent of fermentation, sulphate of ammonia may be the most effective chemical manure to compost with earth for winter use, and nitrate of soda for summer, where grass is the crop required. Several of the artificial manures are much vaunted; but, the preparation being kept secret, we have no means of judging of their real value.

To come as near to his conditions as we can, I should first gather all weeds, roots, and vegetable refuse, and mix it with salt enough to kill all roots and seeds, say a $\frac{1}{4}$ cwt. to the ton; then twice or three times as much slaked lime, and as much earth as would prevent the juice from leaking away. Let this work two or three weeks; then mix with the bulk of earth, more or less according to circumstances; and lastly mix in as much nitrate of soda or sulphate of ammonia, and as much gypsum as salt. After due standing and mixing, this might be used at the rate of 1 cwt. of salt per acre. Sulphate of ammonia with lime is against chemical rule, but with much earth, vegetable refuse, and gypsum, there could be no important loss of ammonia. Soot is a good addition where cheap.

The following substitute for guano, given by Professor Johnston, does not come so near to "A Grazier's" conditions, nor is so especially suited for grass:—

- 315lbs. 7 bushels of bone dust, at 2s. 6d. per bushel
- 100lbs. sulphate of ammonia
- 20lbs. of pearl ash, or 80lbs. of wood ashes
- 80lbs. of common salt
- 20lbs. of dry sulphate of soda
- 25lbs. of nitrate of soda
- 50lbs. of crude sulphate of magnesia.

It is of general application, and the farmer can make it for himself with less danger of adulteration than current guanos.

J. PRIDEAUX.

ARTIFICIAL MANURE FOR PEAS.

In reply to a "Norfolk Farmer," as peas contain much sulphuric acid, and the seeds much potash and phosphoric acid, gypsum is good for them in any case, and vegetable manure or straw-yard dung for potash when they are intended to seed. The best experiments within my present recollection and reference, are those of Mr. Hannam, whose largest crops were from farm-yard dung, with 4 cwt. of gypsum per acre. Superphosphate of lime (bones and sulphuric acid), would be better than gypsum, if there is not phosphoric acid enough in the dung, but of course very much more costly. The dung might be ploughed down in preparing the land, and the gypsum strewed as top-dressing when the plants are well up; a portion might then be tried with superphosphate; and if the difference in produce is more than the difference of cost, it might guide for another time. But I expect gypsum would answer fully upon a moderate dressing of dung. If running up too lank and weakly, 1 cwt. of salt may be mixed with the gypsum, which has produced excellent effect on weak beans, in Scotland.

J. P.

SAWDUST IN MANURE, AS AN ABSORBENT.

It is plain that your correspondent J. R. B. can have the advantages of fresh dung with fermented sawdust, only by working his sawdust beforehand with gas liquor, lime and salt, or some other ferment. But as this must be done damp, it will diminish the absorbent power, and require so much the more; and although it will very slowly decay in the ground, if put in fresh with the dung, it will do little good on grass land (which is generally pretty well supplied with carbonaceous matter), and can be regarded only as an absorbent for helping to spread the rich liquid manure. But it may be questioned whether *fir* sawdust, containing pretty much resin, does not do harm; so I have heard it complained of in Scotland. To prevent this it may be lime-charred*, which requires

a little practice and cleverness. Such charred sawdust, thus impregnated with carbonate of lime, would form an excellent absorbent, and probably have most of the good effects of peat charcoal, after the dung it had carried is exhausted.

J. PRIDEAUX.

* LIME-CHARRING SAWDUST.—If wet sawdust be heaped with fresh-burnt lime the damp will be drawn out by the lime for slaking, and the heat produced may fire the heap, and burn the sawdust to ashes; but if the proportion of sawdust to lime is very great, keeping the stones of lime far apart, the heat of slaking will be too much weakened by dispersion to produce fire. By keeping a medium then, and covering well in from the air, we may attain a point at which fire will be produced in the heart of the heap, but prevented from breaking out to destroy the charcoal. This medium must depend, more or less, on the quality and dampness of the sawdust; but for that of *fir* in its ordinary damp state, in the saw pit, by the changes of weather. We might try twenty bushels to one of lime, laying one-fourth as a bed, mixing one-fourth of the wettest with the lime, and covering in with the remaining half. If the fire break through, more sawdust might be heaped on, and so much more charred; or, if no more, the holes may be stopped with earth in the usual manner. And where sawdust is deficient, the cheapest substitutes are brize or coke dust from the gas-works, or refuse bark from the tan-pits. But it may be questioned whether sawdust may not be very often better employed in absorbing gas liquor, urine, and dung drainings for the wheat and after-grass.—J. P.

SIR,—For "Enquirer's" information, two fields in our occupation contained considerable quantities of "coltsfoot" and "old man's beard," which is quite as difficult to destroy, or more so, than wild onions or garlic. We have succeeded in ridding the greater part of it by ploughing deep—say at least nine inches—winter fallowing, and sowing it with mangels-wurzel or swedes two successive years, taking care to keep down "the weed" by continued hoeing, even after it was necessary for the prosperity of the crop to do so.

We prepare a manure especially for mangel wurzel. It is also particularly well adapted for the growth of seed turnips; and we shall be happy to furnish "Enquirer" with further particulars, on application.

Your correspondent, "A Grazier," will find the following answer his purpose, and produce as fine a manure as he can use for grass land:

- $\frac{1}{2}$ parts finest bone sawdust;
- 1 part Messrs. Gibbs and Bright's finest Peruvian guano;
- 25 parts dry earth;

Very lightly watered with liquid manure direct from his stables or sheds, and sprinkling the whole with gypsum; but although the last is desirable, and would do much good, it is not absolutely necessary.

Yours obediently,

Ilminster, Dec. 2.

T. & J. LANG.

SIR,—In your last publication I see a note from "A Subscriber" desiring information on the subject of arresting and utilizing blown sand-hills or downs. In the end of the second volume of Boussingault's "Economie Rurale," French edition (Baillière has published an English version in one volume), there is an account of the successful experiments of a French engineer, named Bremontier, commenced towards the close of the last century, and still in effective operation in the same locality, viz., the south-west coast of France. The plan consists in sowing a narrow belt of *pine* and *broom* seeds, on the tolerably flat strip of sand which intervenes between the highest mark of the tide and the foot of the slope looking towards the sea. When the seeds are sown, leafy branches of trees are pegged firmly down into the sand, with the thick end of the wood towards the sea, so that they form a protection to the young seedlings. These latter are found to succeed well, and soon to form a thick band of brushwood, which constitutes a barrier to protect another belt of pines (with willows and even oaks), from 50 to 100 yards in breadth, according to circumstances. By this means a barren tract of sand hills is converted into a source of profit, while the drifting of the sand is arrested. I am induced to send this note because I saw the same operation in progress about ten years ago on the east side of Swansea Bay, and was informed that it proved successful. Probably some of your practical readers can give further information on this head, as we believe it has been tried in other places.

Yours obediently,

London, Dec. 22, 1853.

A. H.

REVIEW OF THE CORN TRADE DURING THE MONTH OF DECEMBER.

The weather has, throughout the month, been reasonable: in the early part, the frost was but slight; and where sowing had not been previously completed, a favourable opportunity was afforded for bringing up the arrears. Altogether a larger breadth of land than usual has been cultivated with wheat, and the seed has on the whole been well got in. That committed to the soil early came up strong and even; and though the frost was for a time rather sharp, the heavy fall of snow which took place about the middle of the month afforded a good covering to the young blade; hence the low temperature is not likely to have been attended by any injury—on the contrary, we calculate on great benefit arising from the same, as slugs and other insects (which were previously very prevalent) are likely to have been destroyed thereby. The prospects for next year are therefore, thus far, of a promising character, and it is quite possible that the harvest of 1854 may be as much above as the last has been below that of good average seasons. A favourable seed-time is always an important step gained, and serves to encourage the cultivator, and enables him to meet subsequent mishaps with better spirits.

With regard to the yield of the last crop, we are unable to see cause to alter the opinion already expressed on former occasions. We have no hesitation in affirming that, taking the United Kingdom throughout, the deficiency has amounted to at least one-third; hence we feel no surprise at the progressive rise which has taken place in the value of wheat since harvest.

As the year 1853 is now nearly run out, and we shall not again have an opportunity of addressing our readers till another has been begun, it may not be amiss to take a short retrospect of the course of the trade during the last twelve months.

The very unfavourable manner in which the autumn wheat-sowing of 1852 was accomplished, in consequence of the almost incessant rains, caused a strong opinion to be entertained that prices would advance, and purchases on rather an extensive scale were made, during the winter of 1852 and 1853, on the continent of Europe.

The winter proved nearly as wet as had been the autumn, and no frost of any importance was experienced. With the spring there came no change in the weather; and the hope that the land, which it had been impossible to seed in the autumn, would

be in condition to be advantageously cultivated in spring, met with disappointment. The year was commenced therefore very inauspiciously for the farmer, and the only compensating circumstance was that good stocks of old wheat remained on hand, for which it was reasonable to suppose that remunerative rates would be obtained.

Matters did not improve, in regard to the prospects for the harvest, as the season progressed; the spring wet and cold, the summer for the most part without much sun, during the blooming time heavy gales, and at harvest wet. Such having been the case, the result might have been, and was by many, foreseen. The harvest was very late, the quality generally inferior, and the yield (as already intimated), at the utmost, *two-thirds* of an average.

We have dwelt on all this in previous numbers, in order, as the events have occurred; but a short notice of cause and effect may not be deemed out of place at the close of the year, and when we are about to trace the influence on prices.

During the first quarter of the year, there appeared little probability of the expected improvement in prices being realized. In the first instance, we received large supplies from the Black Sea and Mediterranean; and when these had partly passed into consumption, the early spring shipments from the Baltic and near continental ports began to drop in. Notwithstanding, therefore, an enormously large consumption, caused by the generally prosperous state of most branches of manufacture and commerce, supplies more than kept pace with demand; and, up to the end of May, prices continued to tend downwards.

The actual fall will perhaps be best shown by giving the quotations at Mark Lane in January and in May. In the beginning of the year, Essex and Kent red wheat was worth, according to quality, from 43s. to 53s., and white from 44s. to 60s. per qr., including old and new. In May, prices had fallen for the former to 37s. to 47s., and the latter to 38s. to 54s. per qr. This was about the time of the greatest depression. In the month of June the probability of an unproductive harvest had begun to outweigh the effect of large arrivals: nearly the whole of the fall which had previously taken place was recovered in that month. July witnessed considerable excitement, with an advance of quite 5s. per qr. in the value of wheat, and a corresponding rise in other articles.

The weather, which had up to this period been almost constantly wet and unfavourable, underwent a decided improvement, and we had two or three weeks of hot sunshine. About the same time, considerable supplies of foreign breadstuffs came to hand. The two events combined sufficed to cause something like a panic, and prices fell much more rapidly than they had advanced. But the depression was not of long duration: buyers from France began to make their appearance; and, after a short period, the weather again changed to wet; harvest had then been commenced in some of the early districts, and complaints of the yield were already beginning to be heard. Under these circumstances, the decline was speedily regained, and prices, at the close of August were about the same as at the end of the preceding month.

Early in September, it had become evident that the harvest would be one of the worst gathered in these islands for years, and every one manifested a disposition to increase their stocks. The upward movement in prices was consequently rapid, and the excitement exceeded anything witnessed since 1847. The opening prices for new wheat, at Mark-lane, were 52s. to 56s. for red, and 58s. to 63s. for white. Before the end of September, the same qualities were worth, respectively, 63s. to 68s., and 68s. to 78s. per qr. Other articles had not remained stationary all this time. Town-made flour had advanced to 70s. per sack, malting barley was worth 43s. to 45s. per qr., and oats, beans, and peas had risen in proportion.

A few weeks of comparative calm followed; but before the end of October, fine red wheat had been sold at 75s., and white at 80s. per qr.

November was, on the whole, a quiet month; and there was no appearance of a return of excitement until within the last few weeks, when the revival of the export demand for wheat on French and Belgian account, the increased severity of the weather, and the imminent danger of Great Britain and France becoming involved in the war with Russia, combined to give a fresh impetus to prices; but as we shall give a more lengthened notice of the transactions at Mark-lane during the month, in the usual order, we need not here enter into further particulars.

Thus much for the past. We shall now say a few words in regard to the probable future.

The all-absorbing questions are, Will present prices be maintained? Shall we go back? Will scarcity cause a still higher range? Without pretending to greater foresight than others who have the same sources of information, we may, nevertheless, put forward a few facts, which may perhaps assist our readers in solving the foregoing important enquiries.

The primary cause of the progressive rise (amounting, since the beginning of the year, to 25s. per qr.) has been, the unproductiveness of the harvest of 1853 all over Europe. In France and Italy the produce has been even worse than in England; in Holland, Belgium, and the Rhine Provinces, no better; in Prussia, Poland, and Russia, below the usual average in quantity and inferior in quality.

The entire deficiency in the produce of food must, therefore, be regarded as enormous. With the exception of the Black Sea (where considerable stocks are still held) and America (where the quantity in the interior is said to be large), old wheat may be said to be nearly exhausted. England and France have, no doubt, some accumulation in warehouse to meet future wants; but, for several months to come, they cannot expect to make any material addition to the same, whilst consumption is steadily going on. The Baltic is closed by ice, the Black Sea nearly so by the warlike position of affairs. America alone can, therefore, give us present aid. Meanwhile, there is a possibility, if not a probability, of France continuing her purchases in our markets.

The chances, therefore, appear to us to be much more in favour of a further enhancement than any decline from present rates, more especially if the winter should prove protracted. We are now speaking of what we consider probable between this and the month of April. Beyond that, we do not pretend to see. Much will depend on the aspect of the crop at that time, on the political state of affairs in the east, and other circumstances, of which nothing can be known at present; but, till then, we consider prices likely to be at least maintained, and should not be surprised to witness a rise of 1s. per bushel in the interval.

We shall now give a short report of the operations which have taken place at Mark-lane during the month. The arrivals of wheat coastwise have, contrary to expectation, rather fallen off than increased; and the quantity brought forward by land carriage from the neighbouring counties has been very small. This would lead to the belief that the Essex and Kent farmers have a less portion of their last crop on hand than usual; for present rates must hold out strong temptations to realize. Business commenced quietly enough in the early part of the month; and, notwithstanding a very small show of samples on the Essex, Kent, and Suffolk stands, prices receded 1s. to 2s. per qr. on the 5th inst. During the succeeding week, the demand began to improve, but no portion of the decline could be recovered on the following Monday—a circumstance which must, however, be attributed in some measure to the very ill condition in which most of the English wheat came to

hand. About the middle of the month, the millers were compelled by the urgency of their wants to buy more freely than they had previously done; and on the 19th, an advance of 3s. to 4s. per qr. was established. The rise has since been exceeded in some cases by 1s. per qr.; but the intervention of the Christmas holidays has interfered with business, and the transactions have not been extensive during the last eight or ten days. The last published London average for wheat is 72. 10d., and that for the kingdom 70s. 9d. per qr.

The heaviness by which the trade was characterized in the early part of the month was, no doubt, caused in a great degree by the knowledge that a large supply of wheat was on passage to this port from Russia. Buyers were naturally anxious to ascertain the effect the arrival of the same might produce on prices, and therefore refrained from purchasing as long as they possibly could. The consequence of this was that, when the supply reached us, most of the London and many of the country millers, who are in the habit of obtaining their foreign wheat at Mark-lane, had allowed their stocks to run low: hence, the large supply was met by a very extensive demand. With comparatively bare markets, prices gave way 1s. to 2s. per qr.; but when nearly 90,000 qrs. arrived in the course of about ten days, a ready vent was found, and instead of the reduction calculated on, prices rose 4s. to 5s. per qr.; quotations are, therefore, now higher than they have been at any previous period since harvest. Moderately good qualities of red, including St. Petersburg, Ghirka, and Odessa, are worth from 65s. to 70s. The finer kinds of southern wheat, such as Marianopoli and Berdianski, 72s. to 75s., good Lower Baltic red from 75s. to 80s., and superior Rostock from 82s. up to 85s. American white wheat, which was in the beginning of the month obtainable at 76s. to 77s., has since brought 82s. to 84s., and high-mixed Danzig is worth about the same. Notwithstanding these high rates, buyers continue to visit us not only from different parts of England, but also from some of the near continental ports; and the deliveries from the London granaries have lately been very large. The arrivals of wheat off the coast from Black Sea ports, and from Egypt, have been comparatively small; and most of the cargoes which have come forward have been taken for the continent. Egyptian wheat, of which the supply has been larger than of other kinds, was at one time sold as low as 48s., but last week 51s. per qr. was readily obtained from Belgian buyers. Taganrog Ghirka has been last sold at 70s. per qr., cost and freight; and for Polish Odessa on passage corresponding rates have been realized. There being now little wheat on passage from the Baltic, the transactions with that quarter

have not been important; a few days ago a cargo from Denmark was offered, and immediately placed at 74s. per qr., cost freight, and insurance.

During the temporary drop in the value of wheat in the early part of the month, the town millers—not foreseeing the rally which almost immediately followed—reduced the top price of flour from 75s., at which it had stood for some time, to 70s. per sack. Since then no alteration has taken place, but considerable unwillingness has been manifested within the last week or two to make sales for forward delivery. Norfolk household flour, which was at one time forced off at 54s., has during the last fortnight, risen 4s., and is now worth 58s. per sack. The arrivals of flour from America have thus far been moderate; and stocks in warehouse consisting for the most part of stale qualities, the fresh parcels received have been readily placed at from 40s. to 42s. per bbl. Sour may be quoted 35s. up to 38s. per bbl., according to condition and colour.

The decline in the value of English barley which commenced in November continued during the first fortnight in this month, and good malting, such as had at one period realized 50s., were sold at 45s. per qr.; whilst other descriptions receded in the like proportion. Since then the supplies have fallen off, and the demand has improved; the consequence of which has been, that 2s. to 3s. per qr. of the reduction has been recovered, and it is not improbable that this grain will again mount up to the point from which it lately receded. The arrivals of foreign barley have been trifling, and are likely to be small, except from Alexandria, for some months to come. Good grinding qualities have become very scarce, and are exceedingly dear, say 40s. to 42s. per qr. Egyptian barley is, under the circumstances, taken more freely than would otherwise be the case, and, though not generally liked for feeding purposes, brings from 31s. to 35s. per qr.

Malt was somewhat difficult of sale, and gave way with barley in the beginning of the month, but since the rise in the latter the value of the former has also tended upwards.

English oats have come very sparingly to hand; and the few which have come forward by rail have proved of very inferior quality, weighing only 33 to 35lbs. per bush. They have, nevertheless, met a tolerably ready sale, at prices varying from 23s. 6d. to 26s. per qr.; heavier qualities have brought relatively higher prices. The new Irish oats do not prove so fine as we were led to expect, but they are decidedly better than the English; and the finer sorts have been readily placed at about 29s. to 30s. Prices for soft-conditioned samples have been very irregular. The new Scotch oats are, on the whole,

satisfactory in quality. A few green soft lots have appeared, but most that have been received have given tolerable satisfaction to buyers; their value ranges from 28s. up to 33s. per qr., whilst for fine old Scotch 34s. to 35s. per qr. has been readily paid. The principal business has, however, been in foreign oats, old corn being indispensable at this time of year. The stock of old foreign oats at this port is not by any means large, and there is no chance of any arrivals of consequence during the winter months. Those that have come to hand have consequently met a ready sale at advancing prices, and Archangel, Riga, and St. Petersburg oats are now fetching from 27s. up to 30s. per qr. Danes and Swedes are equally dear, with every prospect of a further rise.

Beans gave way suddenly 4s. to 5s. per qr. in the early part of the month; part of this fall has since been recovered, and fine old pigeon are not to be had at Mark Lane below 60s. per qr. at present; indeed, superior lots are held at 63s. New ticks are worth about 40s. to 42s. per qr., and other sorts bring corresponding terms. Stocks of Egyptian beans are reduced into a narrow compass, and 46s. to 47s. per qr. is about the value of the article.

Peas hung heavily on hand previous to the frost, but the demand afterwards improved, and good boilers have lately commanded 62s. to 63s. per qr. In prices of grey and maple peas no change requiring notice has taken place.

Indian corn has met with much less attention than usual at this period of the year; indeed there has been almost a total want of demand on Irish account for this article—a strong presumptive proof that the potato crop in that country has suffered less from disease than of late years. Supplies from the Black Sea having, however, been very small, and purchases for the continent having from time to time taken off a cargo or two, the value of the article has, notwithstanding the want of activity in the Irish inquiry, tended upwards; and the last price paid for Galatz was, we believe, 44s. per qr., cost, freight, and insurance.

The complete close of the principal ports and harbours of the North of Europe by ice has naturally interfered with business in grain with the Baltic, &c. The transactions have for some weeks been confined principally to purchases made for spring shipment; and thus far the contracts for future delivery have not been very extensive. The rise has, nevertheless, had its usual influence, and prices of wheat have advanced 2s. to 3s. per qr. at the leading ports. Stocks of old wheat appear to have been reduced into a narrow compass; and the deliveries of the new crop have not been large.

The accounts as to the yield and quality of last wheat harvest are not in general of a favourable

character. In Russia and Upper and Lower Poland, as well as in Prussia, the quantity is reported to fall short of expectation; and, judging from the weight per bushel quoted, we can hardly expect fine quality from those districts. In Pommerania, Silesia, and the Uckermark country the harvest seems to have given a fair return; but old stocks are said to be nearly exhausted in those districts, and as the export demand is likely to be extensive in the spring, farmers calculate on high prices. In the Rhenish provinces the harvest has given a very unsatisfactory return; and the probability is, that there will not only be nothing to spare for export from thence, but that large imports will be needed. Holland and Belgium have already taken considerable quantities from the Baltic and from us, and are likely to require more. The wants of France and the Italian States are too notorious to need comment. It appears, therefore, that the whole of Europe suffered more or less from the unfavourable character of the past summer, and the prevalence of rain during harvest time.

In America, on the other hand, this was not the case; and we are inclined to think that the United States and Canada will have a larger quantity of breadstuffs for export than in ordinary seasons; but, looking at the great deficiency in Great Britain and in France, and the decrease in the produce of several of the other European countries, the supplies from America can scarcely be expected to keep down prices on this side of the Atlantic.

In the Baltic, quotations are relatively as high as in this country; and those who purchase at present for a spring shipment must feel tolerably certain of a further rise, or their operations cannot yield them a profit.

At Stettin, moderately good qualities of new red wheat, weighing 61 lbs. per bushel, have realized 66s. per qr., free on board in spring; and at Rostock 70s. has been paid. At the near ports prices are even higher.

In the Mediterranean it is impossible to buy so as to leave a profit on our present quotations; and, though quotations are more moderate in the Black Sea, the scarcity of ships, and the danger of capture in case Russia and England should go to war, must act as impediments to obtaining any supplies of importance from thence.

America appears therefore to be our only resource, and it is scarcely to be supposed that merchants there will, under the circumstances, be very anxious sellers; the late quotations from New York are so high, that, with freight and insurance added, the cost here will be quite as much as the article is worth.

The following tables of the importations into the United Kingdom in each month during the years 1852 and 1853 may prove of interest to our readers.

IMPORTED INTO THE UNITED KINGDOM DURING THE TWELVE MONTHS ENDING DECEMBER 5TH

1853.

	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.	Maize.	Flour.
January 5.....	248792	50650	29229	63	32972	14203	85599	238505
February 5.....	441678	73690	80861	4474	41474	12553	95924	305620
March 5.....	136704	32666	31036	682	10655	5412	54532	206970
April 5.....	287153	59672	15868	20243	30906	1659	214508	762206
May 5.....	343400	112072	69333	11584	27353	5705	174128	555743
June 5.....	525236	131296	123531	9038	24111	7119	163495	341944
July 5.....	331193	55742	47841	1724	32795	12431	118172	369843
August 5.....	691737	132233	85001	11712	40091	4951	288222	379219
September 5.....	546924	68721	166231	7102	30994	3103	173565	381611
October 5.....	468888	56422	158633	7373	37705	4742	125512	463515
November 5.....	425166	34928	88875	1895	17844	7491	58685	302355
December 5.....	411121	41571	81375	870	35257	24247	46714	294212
Totals	4858699	849693	977841	76760	360157	103619	1599057	4635823

1852.

	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.	Maize.	Flour.
January 5.....	178839	38757	42869	—	31539	10442	126183	366759
February 5.....	126354	27413	20404	—	65993	1588	58135	192102
March 5.....	117614	44928	68265	58	28951	5700	72987	172709
April 5.....	187458	50043	69978	—	47248	2863	144782	334792
May 5.....	220791	60845	53874	23	57222	3186	122321	415971
June 5.....	184461	42786	104639	—	48869	2806	109165	377703
July 5.....	219730	45581	90280	1151	116429	6327	110136	437474
August 5.....	275241	92898	132570	1267	21232	20436	91333	456691
September 5.....	352461	79193	130715	1531	14976	4919	104512	480370
October 10.....	315653	30484	179752	1558	18727	3766	192883	298467
November 5.....	420214	50479	61461	888	33566	19970	175843	285042
December 5.....	405445	51432	54303	3482	23288	21333	212209	169806
Totals	3094261	609139	1009115	9958	508040	103341	1520489	4017825

In conclusion, we beg to offer our friends and subscribers our best wishes, and trust that though the aspect of affairs is for the moment threatening, the new year may prove happy and prosperous.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter	
WHEAT, Essex and Kent, white.....	70 to 72	fine 76 83
Ditto ditto new.....	66 72	fine 76 83
Ditto ditto red.....	65 70	" 76
Ditto ditto new.....	62 72	" 76
Norfolk, Lincoln, & Yorksh., red..	61 69	" 75
BARLEY, malting, new..	42 45	Chevalier.. 45 47
Distilling ..	39 42	Grinding.. 35 40
MALT, Essex, Norfolk, and Suffolk, new	66 67	extra 69
Ditto ditto old	64 65	" 68
Kingston, Ware, and town made, new	70 71	" 72
Ditto ditto old	68 70	" 71
OATS, English feed..	25 29	Potato.. 28 32
Scotch feed, new	28 31, old 31 34	Potato 34 36
Irish feed, white	27 28	fine 31
Ditto, black	24 26	fine 27
RYE	none	—
BEANS, Mazagan.....	40 42	" 45 48
Ticks.....	42 44	" 46 50
Harrow.....	44 46	" 48 52
Pigeon	44 50	" 52 60
PEAS, white boilers	61 64, Maple 42 45	Grey 39 42
FLOUR, town made, per sack of 280lbs.	—	" 65 70
Households, Town 62s. 65s. Country	—	" 60 64
Norfolk and Suffolk, ex-ship	—	" 57 58

FOREIGN GRAIN.

	Shillings per Quarter	
WHEAT, Dantzig, mixed..	75 to 76	high mixed 78 82 extra 85
Konigsberg	73 75	— 76 80
Rostock, new	76 78	fine .. 82 " 84
Pomera, Meckbg., and Uckermk., red	72 75	extra .. 78
Silesian.....	72 75	white 76 78
Danish and Holstein	71 75	none
Rhine and Belgium	—	old —
Odessa, St. Petersburg and Riga, ..	62 64	fine 66 70

BARLEY, grinding 34 38	Distilling..	40 42
Malting.....	none	—
OATS, Dutch, brew, and Polands 27s., 30s. ..	Feed ..	24 28
Danish & Swedish feed 29s. to 30s.	Stralsund ..	30 31
Russian.....	27 28	French.. none
BEANS, Friesland and Holstein	44 48	
Konigsberg..	47 50	Egyptian .. 45 47
PEAS, feeding	50 55	fine boilers 58 63
INDIAN CORN, white.....	42 45	yellow 42 45
FLOUR, French, per sack (none) ..	—	none —
American, sour per barrel	35 37	sweet 40 43

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.

WEEK ENDING:	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
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
Nov. 26, 1853..	72 0	41 9	26 0	43 7	50 11	54 9
Dec. 3, 1853..	72 7	40 9	26 3	43 5	52 0	53 5
Dec. 10, 1853..	71 11	39 9	25 4	43 3	50 6	51 5
Dec. 17, 1853..	70 9	38 9	24 11	44 7	48 10	51 10
Aggregate average of last six weeks	72 3	40 11	25 8	43 6	50 9	54 1
Comparative ave. same time last year	41 3	30 1	18 6	28 7	35 2	22 5
DUTIES.....	1 0	1 0	1 0	1 0	1 0	1 0

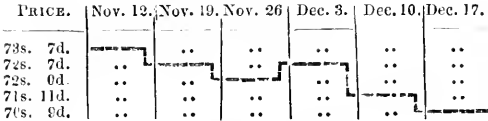
LONDON AVERAGES.

	£ s. d.			£ s. d.		
Wheat ..	2,958	qrs. 3	12 10	Rye	1	qrs. 2 3 0
Barley ..	3,739	1	18 11	Beans....	796	2 4 10
Oats	4,088	1	6 4	Peas	235	2 12 8

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's Gazette.			Averages from the corresponding Gazette in 1852.		
	Qrs.	s. d.	Qrs.	s. d.	
Wheat...	55,349	70 9	121,850	43 10	
Barley...	97,814	38 9	116,239	29 9	
Oats	21,504	24 11	30,351	18 5	
Rye.....	160	44 7	153	29 2	
Beans....	5,185	48 10	6,151	34 6	
Peas	2,046	51 10	3,503	32 0	

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING DECEMBER 17, 1853.



PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.).. sowing 60s. to 64s.; crushing 50s. to 56s.	
Linseed Cakes (per ton).....	£10 0s. 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.).....	55s. to 58s.
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.).....	30s. to 36s.
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.....	56s. to 66s.
Ditto, white.....	66s. to 96s.

HOP MARKET.

BOROUGH, MONDAY, Dec. 26.

There has been rather more enquiry during the past week for Hops, especially for those of cheaper quality; but in other descriptions the trade remains unaltered.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

MONDAY, Dec. 26.

During the past week, owing to contrary winds, there have been few arrivals coastwise, and salesmen have been enabled to effect a clearance of old stock.

The following are this day's quotations:—

	s.	d.	s.	d.
York Regents	120	0	to	160
East Lothian ditto	120	0	—	150
Ditto reds.....	120	0	—	130
Forfarshire Regents.....	110	0	—	120
Pertshire ditto.....	110	0	—	120
Fifeshire ditto.....	110	0	—	120
Reds and Cups	90	0	—	110
Rhenish.....	100	0	—	110
Norway and Swedish	60	0	—	70

BOROUGH AND SPITALFIELDS.

SATURDAY, Dec. 24.

The arrivals of Potatoes this week, coastwise and by land-carriage, have been moderate. The imports are

315 tons from Rotterdam, 90 tons from Norway, 6 bags from Russia, and 7 tons from Ireland. The demand is steady, as follows: York Regents, 105s. to 150s.; Scotch, 95s. to 140s.; foreign, 75s. to 100s.; Irish, 85s. to 100s. per ton.

ENGLISH BUTTER MARKET.

Dec. 23.

We note a low trade, chiefly for want of a fine quality of Butter the supply of Weekly Dorset being now almost at an end, and the stale parcels coming to hand are neglected for fresh foreign goods.

Dorset, fine weekly	106s. to 108s. per cwt.
Do., middling	94s. to 98s. ,,
Fresh, per dozen lbs.....	12s. to 15s.

BELFAST, (Friday last.)—Butter: Shipping price, 95s to 100s. per cwt.; firkins and crocks, 10½d. to 10¾d. per lb.; Bacon, 53s. to 58s.; Hams, prime 70s. to 76s., second quality 60s. to 66s. per cwt.; mess Pork, 85s. to 87s. 6d. per brl.; beef, 105s. to 110s.; Irish Lard, in bladders, 66s. to 70s.; kegs or firkins, 64s. per cwt.

Dec.	Butter.			Bacon.			Dried Hams,			Mess Pork.						
	per cwt.	s.	d.	per cwt.	s.	d.	per cwt.	s.	d.	per brl.	s.	d.				
23.	68	0	73	0	39	0	42	0	60	0	84	0	65	0	67	6
1849..	76	0	84	0	38	0	44	0	60	0	62	0	56	0	58	6
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	6	75	0
1853..	95	0	100	0	53	0	58	0	70	0	76	0	85	0	87	6

CHICORY.

LONDON, SATURDAY, DEC. 24.

Our market is largely supplied. Dealers continue to act cautiously. The demand is therefore heavy, at barely the late decline in the quotations. The imports are 608 bags from Rotterdam, and 160 ditto from Guernsey.

		Per ton.		£ s. £ s.	
Foreign root (in £ s. £ s.)	10	10	10	10	10
Roasted & ground					
English.....	18	0	20	0	20
Guernsey.....	30	0	36	0	36
York.....	26	0	28	0	28

WOOL MARKET.

BRITISH WOOL TRADE.

SATURDAY, Dec. 24.

Although the supply of English Wool on offer is very moderate, we have no improvement to notice in the demand. Prices, however, continue to be well supported. The purchases for shipment to the continent have been trifling.

	s.	d.	to	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

HIDE AND SKIN MARKETS.

SATURDAY, DEC. 24.

These markets continue to be extensively supplied, yet a good business is doing in them, at our quotations.

	s.	d.	s.	d.	per lb.
Market Hides, 56 to 64 lbs.....	0	2½	to	0	3
Do. 64 72 lbs.....	0	2½	to	0	3
Do. 72 80 lbs.....	0	3	to	0	3½
Do. 80 88 lbs.....	0	3½	to	0	3½
Do. 88 96 lbs.....	0	3½	to	0	3½
Do. 96 104 lbs.....	0	3½	to	0	4
Do. 104 112 lbs.....	0	4	to	0	4½
Horse Hides.....	5	6	to	6	0 each.
Calf Skins, light	2	0	to	3	6
Do. full	6	0	to	0	0
Polled Sheep.....	7	0	to	9	0
Kents and Half-breds.....	6	0	to	7	6
Doerms	4	6	to	5	6

THE FARMER'S MAGAZINE.

FEBRUARY, 1854.

PLATES.

(For the descriptions see page 184.)

THE POTATO CROP.

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

The result of another year's growth of potatoes has been, upon the whole, rather cheering. If the disease with which it has been scourged still ravages many great potato districts, still in other equally extensive potato-growing lands the crop has been attacked to a much less extent than in former years: from some places the disease has entirely taken its departure. In my own ground, the potatoes grown in 1852 were diseased, and worthless to the extent of four or five bushels in every ten; but in the crop of 1853, not more than one bushel in ten was diseased. The potatoes, too, of 1852 became diseased in the store bins: those of 1853 have kept almost entirely free from disease. The plan I have followed has been, as soon as the disease made its appearance in the potato stalks, to immediately mow the haulm off, and then leave the tubers in the ground until the end of September or beginning of October. I have grown almost entirely the Early Kidney and Regent potatoes; some Red Roughs from Forfarshire—a district in which I was informed the potato disease has been very little seen; but they were fully as much diseased with me as the other varieties. The employment of different manures, such as that of the horse and the pig, did not appear to make any difference in the healthiness of the crop; but a top-dressing, of a mixture of common salt with the sulphates of magnesia and soda, seemed materially to diminish the extent of the attack, the top-dressing being used (the ground manured with farm-yard manure as usual) as soon as the sets were planted. Saline manures appear indeed to be peculiarly grateful to the potato.

Mr. Herapath has suggested the following plan to prevent the disease (*Gardener's Chron.*, Oct. 29)

—first, to thoroughly dry the seed potatoes, then to steep the seed potatoes for 36 hours in a solution of blue vitriol (sulphate of copper); for this purpose, he adds 8 oz. of sulph. copper to 1 gallon of water. He proposes then to dress every potato set with $\frac{1}{2}$ an ounce of the following mixture:—

Wood ashes	30 lbs.
Calcined bones	15 "
Gypsum	10 "
Common salt	20 "
Lime, slaked by exposure to atmosphere	30 "
Nitrate of soda	7 "

As to early or late sowing, I rather incline, from the results of my experience, to autumn planting; and although in the case of the crop of the year 1853 the result seemed hardly the same, yet this, I feel, was attributable to the very unusually wet and protracted autumn and spring weather of 1852-53.

I have found this summer that sweeping off the growing haulms when the disease appears, was certainly attended with the disadvantage of encouraging the growth of weeds; and the same remark has been made by Mr. James Fulton of Jamestown (*Quar. Jour. of Ag.*, 1854, p. 273), who has in such cases successfully practised the plan of sowing rapeseed upon the potato ridges, as soon as the scythe has levelled the potato haulm.

The evils which Mr. Fulton intended to prevent are thus described by him: "The writer has very frequently observed that the succeeding corn-crops, on land overrun with this spurious vegetation, turned out much lighter than what was to be expected; and this has been corroborated by the testimony of several farmers of observation and

judgment, when he talked to, respecting the cultivation under notice, who aver that in 1847, when the disease assumed a virulent type, the land was so much deteriorated in consequence, that it has not yet recovered its previous state of fertility. With the view above stated, several plants were used, such as rape, stubble, turnip, white mustard, and crimson clover. Of these, so far as the trials had determined, rape was considered the most suitable, as combining in the highest degree the important qualities of springing up quickly to cover the land, in affording protection to the potato in winter, and in producing bulk of food for stock in the spring of the year; all of which purposes it is capable of serving.

“Much of the success of this cultivation will depend on seizing the proper time of sowing, which in general will be on the first indications of the disease, or while the branches and leaves afford shade and maintain an equably moist state of the surface. If sown in moist and cloudy weather, this protection is less necessary; and although timely sowing is a requisite element of success, its chief advantage is to get predominance over the weeds. If these essentials are attended to, the seed will germinate in the course of four or five days, according to the state of the weather, when a very beneficial interchange will take place between the two crops. As the potato tops fall down the rape springs up, the decaying matter of the former supplying food for the latter; whilst the latter by its roots acts as an antiputrescent by abstracting decomposing matter from the tubers, and arrests the farther progress of the disease. About the beginning or middle of April the land will be wanted for getting in a crop of barley or April wheat, or the potatoes still in the ground may be wanted for planting. The cutting of the rape will next engage attention. This is best performed by a bagging or strong reaping hook. When the land is cleared, a grubber, followed by a drill-harrow, should go through the intervals, to take up the roots of the rape. When these are gathered, the drills can be split by the double-wrested plough, and the potatoes gathered; or they may be dug in the usual way.”

I had once inclined to the opinion that the seedling potatoes used in different stages of ripeness might be differently affected by the disease; but the result of my trials have afforded little or no information of value on this branch of my enquiries. In a similar enquiry, made long since by Mr. H. S. Thompson (*Jour. R. A. S.*, vol. vi, p. 167), he made the following remarks, when treating upon the prevention of the curl and the dry rot in the potato, upon the composition of the potato-tuber in two different stages of its growth:

“It is notorious to potato-growers that a marked

change takes place in the quality of the tuber when the stem and leaves wither, and that potatoes taken up when the plant is still growing are invariably watery, though a portion of the same plot, if of a good sort and in suitable soil, taken up a few weeks later, will be found light and mealy. This is probably owing to the deposition of starch in the tuber by the descent of the sap when the growth of the plant has ceased, and is apparently analogous to the very similar process described by Professor Liebig as taking place in all perennial plants. ‘All the carbonic acid which the plants (speaking of perennials only) now absorb is employed for the production of nutritive matter for the following year. Instead of woody fibre, starch is formed, and is diffused through every part of the plant by the autumnal sap.’ To remove every doubt on the subject, however, I took up portions of two kinds of potatoes growing in very different situations, and sent a ripe and unripe sample of each to Mr. Spence, analyzing chemist, York, merely numbering the samples, and requesting to know the percentage of starch in each. The result was as follows:—

	Water.	Starch.	Remainder, consisting of dry fibre, &c.
No. 1. Black kidneys, unripe	68.7	17.7	13.5
No. 2. Ditto, ripe	72.0	17.9	10.0
No. 3. Round reds, unripe	69.8	15.1	15.0
No. 4. Ditto, ripe	73.8	17.9	8.2

The proportion of water in the unripe samples here seems to be about 4 per cent. less than in the ripe samples, but this was probably owing to the unripe samples having been taken up some weeks earlier, and kept out of the ground until the others were considered ripe enough. If this were taken into account, the increase of starch in the interval would be still more marked. As it stands, however, the altered proportions of the principal constituents are remarkable. Neglecting the water as unconnected with the present inquiry, we find that the proportion of starch to the other solid matters is as 177 : 135 in the unripe kidneys, but as 179 : 100 in the ripe; or reducing both to a common measure, we have—

Starch : other solid matters : : 131 : 100 in the unripe kidneys.

Starch : other solid matters : : 179 : 100 in the ripe ditto.

In the round reds, reducing as before to a common measure—

Starch : other solid matters : : 100 $\frac{2}{3}$: 100 in the unripe reds.

Starch : other solid matters : : 216 $\frac{1}{3}$: 100 in the ripe ditto.

“In each case it thus appears that the proportion of starch to the other solid matters had increased

considerably in the interval which had elapsed between taking up the ripe and unripe parcels."

As the present high value of agricultural produce will probably induce a more extended growth of this root, such practical enquiries as these will be attended with considerable advantage; and I have addressed myself on the present occasion to this theme, because when this paper presents itself to the readers of the *Farmer's Magazine*, the ordinary time for potato planting will be rapidly approaching. As I have in another place remarked (*Farmers' Almanac*, 1854), the planting of early potatoes, chiefly for the London market, commences in the west of England at the latter end of October. The soil and climate of Cornwall are peculiarly adapted to the growth of this root, the land being generally dry, light and friable, and the climate moist and mild. From 12,000 to 15,000 bushels of early kidney are sent annually to the eastern markets. "Of the early kidney the planting commences the latter end of October, and continues until Christmas. Lay is best adapted for the purpose, which is turned down in a peculiar manner by hand labour, and a good tilth obtained on the surface by the dexterous hand of the workman. The manure used is generally seaweed. The 'sets' are placed in the drill, a little earth thrown on them, and the seaweed placed over the whole. A better plan is to place a little rotten stable-dung between the earth and seaweed. The early potatoes are not banked-up, but merely hoed, and this not after the middle of March. They are grown on the growan (granite) soils, but the most extensive breadth is on the greenstone rocks, where they intersect the slate in the fine sheltered districts near Penzance, 1000 acres of which, it is said, yield a rental of £10,000. A few of the potatoes are taken up early in April, and these are worth 1s. 3d. per lb. on the spot (occasionally 2s. 6d. per lb.). These are not obtained by digging up the entire plant, but by carefully examining the root with the hand, and pulling off such tubers as may be sufficiently large; the root is then covered up again. The potatoes are full-grown about the middle of May" (*Farm. Mag.*, vol. xxxviii, p. 347). Surely this raising of early potatoes (the safest from disease of all potato crops) might be extended to other portions of the kingdom. Some experiments in a novel and useful direction have been instituted, at a suggestion of Mr. Stephens, by Mr. G. W. Hay, of Whiterigg, Melrose, upon the adaptation of each variety of the potato to a particular soil (*Quar. Jour. Agri.*, 1853, p. 577). These experiments were made in 1852, in order to ascertain the length of the filaments which different varieties of potatoes extend previously to forming their tubers, with the view of discovering, if possible, the varieties best adapted

for the different textures of soils; for it seems reasonable to expect that the varieties which shoot out the longest filaments should be planted in soils of the loosest texture, and that dense soils would obstruct the free growth of such varieties. The soil on which the trials were made is a stiff clay on a retentive subsoil, not adapted for such an experiment. Other trials are now carrying on. "I am persuaded," observes Mr. Hay, "that were we to use even common precaution in assimilating the habits of our root plants to the texture of the soil, and to attend more to the selection of our seeds and roots, we should raise not only much larger crops, but of better quality; and were we also to follow the example of our gardening friends, we would collect seeds of all kinds only from the best grown and most healthy plants, from soils similar to those in which we desire to raise our own crops. Do we not, too, use our sets of potatoes indiscriminately from the pits, cutting large and small together, and even taking sets from both ends of the tuber, although we well know that the crown gives us the best plants, while the end attached by a filament to the parent stem produces an almost worthless plant?" Mr. Hay notes—that the second year's produce is always superior to the first year's change: that plants intended for a stiff or light soil ought to be brought from a similar soil; for a poor soil, the seeds should come from one of a better quality and a better climate. The following table gives I., the name of the potato used; II., whether early or late; III., the length of the filaments in inches—

	I.	II.	III.
July kidney	early garden	..	3
Lawson's conjuror	2d early garden	..	3
Ash leaved	early garden	..	1½ to 2
Dwarf early frame	earliest garden	..	1 — 2
Common frame	ditto ditto	..	1 — 2
Prince of Wales	2d early garden	..	6 — 8
Goldfinder	ditto ditto	..	1 — 2
Manlie's early	early garden	..	1 — 3
Java	late field	..	6 — 8
Jackson's kidney	early garden	..	1 — 1½
Chapman's kidney	ditto ditto	..	3 — 6
Henk's kidney	medium garden	..	2
Fox's early globe	earliest garden	..	2 — 3
Williamson's early	ditto ditto	..	½ — 1
Martin's early	early garden	..	1 — 1
London dwarf kidney . . .	earliest garden	..	1
American dandy	early field	..	1 — 2
Scotch yam	late field	..	½ — 1
Ogilvie's red	very late field	..	1 — 3
Perthshire red	early field	..	3 — 5
Orkney red	very late field	..	6 — 8
Second American	early field	..	2 — 5
Ditto new seed	ditto ditto	..	8
Orkney red	very late field	..	6 — 8

Professor Bollman, a Russian savaan, has announced, from repeated trials, that thoroughly dried

potatoes, when used for seed, will escape entirely the potato disease. The plan he adopted was to keep them in a room heated to 72 degs. or more for a month. The plan seems worthy of trial. When we repeated this experiment, however, in June, 1853, the potatoes did not afterwards vegetate, probably from the heat applied being too considerable; and the same fate attended a similar experiment at Chiswick Gardens (*Gard. Chron.*, 1853, pp. 355, 371).

The large home-growth of potatoes is, after all, not nearly sufficient for the demand; a great amount of foreign potatoes is annually imported. In the

three last years ending January 5, there were imported into this country (*Parliamentary Paper*, 1853, No. 102).

1851	1,348,883 cwts.
1852	636,771 „
1853	773,659 „

There is then, in the cultivation of potatoes, more than one important question for the serious attention of the skilful English farmer. It is a crop which I have no doubt will hereafter (when the potato disease has ceased) again add to his resources in helping to support, I trust, a well-fed and happily employed population.

THE LONDON DRAINAGE—ITS VALUE AND USE.

BY J. TOWERS, M.R.A.S., H.S., ETC.

An interesting article appeared in the *Mark Lane Express*, of January 2, written by Mr. John James Moore, upon the above engrossing subject. It comprised statements which claim the attention not only of town authorities and Boards of Health, but also of the agricultural body in general, because they bear upon the great *guano question*, in conjunction with any attempts to discover either a cheap substitute, or adjunct of, that most valuable but costly fertilizer.

Residing in the town of Croydon, where, since the spring of 1849, I have observed the widely extended progress of those vast operations (to effectually drain the town, and supply it and its vicinity with spring water of fine quality) which were directed by the Local Board, I feel authorized to examine a few of the prominent points of Mr. Moore's article, with a view to enhance its merits, while bringing forward chemical facts to which it does not allude. In the first place, after pointing to the pollution of the Thames and other rivers, Mr. Moore approaches the vexed question of the comparative merits of *solid* v. *fluid* manures, and says that the projects proposed in order to *filter* and *precipitate* the former from the sillage, and to prepare it for drying, and its transit elsewhere, are inconsistent with the recognised principles of science, and inadequate to produce the required effects. He adduces the use of lime as a precipitant, and justly observes that by it a large portion of ammonia is dissipated, to detain which certain arrangements have been proposed that would produce a complication inapplicable to the quantity of matters treated.

Farmers in general have preferred manures in the solid state, overlooking the valuable drainage that flows away from their dung-hills. Mr. Moore admits that he himself used the solid manure till he had ascertained that it was only the portion which was in a state of chemical solution in water, or as a

gas, that plants took up; hence the comparative non-effect of guano in dry weather, and when the earth is dry until rain comes to dissolve it. At this point I beg to observe that when farm-yard *spit* dung or farm and fold manure, with a mass of undecomposed straw, are ploughed into the land, the whole becomes decomposed and broken-up by an invisible agency, which, in the absence of a better term, we call *electricity* and *electro-magnetism*. The presence of moisture is doubtless required, because by its elements (hydrogen and oxygen) new and opposite electric agencies are elicited, which acting by *induction*, produce a play of affinities among the organic elements of the manure, that again *reciprocate with the vital principle of the plants*, laborate the matter termed *raw sap*, and *propel it into the spongioles of the roots*. Thus a vague idea may be suggested of those mysterious processes which are concerned in promoting the development and growth of vegetable organic structures. Mr. Moore considers farm-yard manure as a substance in a state of partial decomposition; that it acts upon the soil, and brings it into the state of vegetable food. Be this as it may, a *manure, before it can act as food*, must be made part and substance of the ground itself, by that *absorbing* and *firing* power with which agricultural earths are endowed. This great principle ought never to be lost sight of; it is the basis upon which, in connexion with the *rotation of crops*, the science of manuring is founded.

In respect to the solid matter, however obtained, from town drainage, the case is different. If *lime* be used, the sediment becomes a tenacious heavy mass, which, judging from a large quantity shown to me by one of our best farmers, could not be easily broken up and scattered over the land prior to ploughing. And, after all, the chemical reader may form some estimate of its merits by a careful perusal of the annexed table. It is one of analysis, by Professor

Way, of a specimen of sewage, supplied by the Commission of Sewers, and taken from Barrett's Court, London. An imperial gallon contains in grains and tenths—

	Soluble.	Insoluble.	Both.
Organic matter and salts of ammonia	121.50	180.32	301.82
Sand and detritus of the granite of the streets	1.39	19.30	20.69
Soluble silica	1.57	10.94	12.51
Phosphoric acid	7.71	2.73	10.44
Sulphuric acid	10.71	4.02	14.73
Carbonic acid	11.62	3.97	15.59
Lime	7.50	17.03	24.53
Magnesia	2.87	traces	2.87
Peroxide of iron and alumina ..	traces	6.20	6.20
Potash	46.91	1.22	48.13
Soda	—	1.51	1.51
Chloride of sodium (common salt)	31.52	1.72	33.24
	243.30	248.96	492.26
Ammonia in a gallon	36.72	4.56	41.28

Now, taking it for granted that the far greater part of the ammonia and all the alkalis and salts comprised in column I are lost and washed away, while so small a quantity of bone phosphate (2.73) is retained in the *solid* portion of the best sewage, what opinion can reasonably be formed of this so vaunted manure? It contains little or nothing of that putrescent organic matter which abounds in farm-yard dung, and supplies no other compensating element. In conclusion, keeping in view the prodigious *efficacy* of the Edinburgh entire liquid sewerage, and the statements given elsewhere, I cannot do otherwise than agree with Mr. Moore in his decided preference of sullage as it flows from the sewers, undisturbed by either mechanical filtration or chemical agency.

January 7, 1854.

BRITISH MANURES *versus* GUANO.

“Wilful waste makes woful want.”

I wish emphatically to urge upon the British public the immense importance which a systematic collection and due preservation of all manures, sewage, and refuse of every sort will be to the farming interest of the kingdom, and the amazing loss the community sustains by suffering such a “wilful waste.”

It is but little that a plain farmer can do to effect such a revolution in the economy of every household, as must take place before the greater portion of animal and vegetable refuse, convertible into useful manure, shall meet with universal preservation, and which, indeed, can only be accomplished by shewing and proving its high value to the satisfaction of the British people, and then to enforce its preservation, and provide for its collection by legislative enactment.

BRITISH DOMESTIC MANURES.—By this term I include all kinds of sewage, night-soil, and animal or vegetable refuse, the product of domestic economy, made in the conduct of household affairs in every family.

SEWAGE MANURE.—Meehi remarks, that in sewage manure “the chemist recognizes rounds of beef and basins of turtle, cargoes of sugar, coffee, and port wine, millions of 4lb. loaves, and thousands of tons of cheese and butter.”

NIGHT-SOIL.—Voelcker says: “The solid excrements of men are richer in fertilizing materials than the excrements of the horse, cow, pig, or sheep. The food of man consists of products derived both

from the vegetable and animal kingdoms; and both kinds of food, in the same quantity of materials, contains more nitrogenized matters and inorganic salts than the food upon which cattle, horses, sheep, and pigs live: in other words, the food of man is more concentrated than the food of herbivorous animals, which are generally instrumental in the production of farm-yard manure.” It will require no great sagacity, therefore, to discover “the superiority of human feces as fertilizers over those of our domesticated animals.”

ANIMAL AND VEGETABLE REFUSE.—Much valuable manure of this kind is annually wasted by every family. The great aim being to get rid of such kitchen-refuse as quickly as possible, it is altogether discarded and thrown away.

The importation of guano costs this country two millions annually, and if it can be found in any other part of the world, it will go on augmenting; the probabilities, however, are that the stocks of guano will soon be exhausted. Professor Way (I think) calculates the value of human excrement to be equal to an average of £1 per head per annum; and taking the population at 28,000,000, it will give an aggregate value of £28,000,000, to which add the value of all other sewage and animal and vegetable refuse, the whole amount of manures of all kinds now for the most part allowed to run to waste, gives a total which may be taken at an estimate of £50,000,000 annual value—*fifty millions annually wasted!!* Mr. Lawes and Dr. Gilbert proved at

Rothamstead that unmanured land produced 16 bushels of wheat; the same manured with 14 tons of farm-yard manure produced 21 bushels. That unmanured land produced 13 *cwt.* of turnips; the same manured with 12 tons of farm-yard manure produced 17 *tons.* Night-soil, as compared with farm-yard dung, is as 7 or 8 to 1, at least, in fertilizing qualities; and although its application to the land cannot be measured by tons, yet its equivalent of 1½ tons per acre would be found a sufficiently ample dressing, and produce equal crops. We have, then, on this showing, 50,000,000 tons of these manures, which if preserved, properly prepared, and applied to the soil, would produce the astonishing quantity of 23,437,500 qrs. of wheat, or 612,500,000 tons of turnips. To put this important question in this way may appear peculiar; but we like to show a plain fact. Here are 50,000,000 tons of first-rate manure annually lost, which, if applied to the soil, would yield, for the benefit of the community, an equivalent in produce to about 24,000,000 qrs. of wheat, which at the present market value would realize near £100,000,000 sterling. I am well aware how greatly figures may be made to swell these accounts, and how objectionable may be this mode of dealing with a question so important, and possessing so many phases; but if I can succeed in showing in the aggregate such an astonishing loss as £50,000,000 worth of manure annually, which would, if properly collected and applied to the soil, produce food sufficient for the wants of 15,000,000 people, I shall be doing something to excite that attention, and provoke that discussion upon which the application of the remedy rests, *i. e.*, the enlisting the sympathies and determination of the public to adopt such measures as may ultimately cause the preservation of vast quantities of these manures, and the preparation of them for general use in agriculture.

The various methods now practised in deodorising these manures give great facility for their collection, and the many contrivances which families might adopt for their preservation every mason or carpenter could put up. I only want to enlist "the will:" "the way" is easy of accomplishment.

We must, like the Chinese, have a law forbidding the waste, and providing the machinery necessary for its safe and regular collection; as also its conversion into dry manures, for exportation into various parts of the country, or for its dispersion by sewage pipes or otherwise throughout the districts near the main receptacles or depôts for collection. In every large town these matters are of easy arrangement, and, if properly regulated and

carefully carried out, would be rendered less objectionable than at present. Of one thing I am certain, that something must be done as a sanitary measure; for the late investigations into nuisances, owing to the recent fears relative to cholera, have brought to light innumerable cases of woful neglect of common cleanliness, which, under a general Act of Parliament for the collection of sewage manures, could not occur again.

There need not be the slightest demur relative to the sale of such manures, as they could be afforded at a very moderate price. The cost of collection and deodorising would not exceed 40s. per ton, and the facilities for delivery, by railway and otherwise, is so great that a constant demand would exist, more particularly as a substitute for guano, which I have no doubt it would soon be made to equal in its fertilizing properties, through the intervention and skill of our agricultural chemists. Hence from this source we have an annual supply of home-made guano, which all the shipping in the kingdom could not procure us from Peru, even if it was to be had; but when it is considered that the whole known quantity there and elsewhere does not reach to one of these annual supplies here, what an important fact does it show, and what a strong reason does it point out for our immediate attention!

The subject is of the gravest importance, and is well worthy the attention of the statesman. To make provision for the wants of the people by economising our own resources is the duty of every one: it is true wisdom to endeavour to make this country independent in every respect, as far as possible, of other countries. In this one particular it may be made so, and with astonishing benefit. British guano, to an enormous extent may be thus secured, and of highly valuable fertilizing powers. Poittevin's manure, Clarke's compost, Lance's humus, Turnbull's humus, Lawes' carbon—these and most other artificial composts partake largely of night-soil and sewage, and their value has long been tested and their uses fully approved.

I would, then, with all deference, again throw out the suggestion that an Act of Parliament should be passed, forbidding such waste, and giving powers to every parish to appoint proper officers to arrange for the preservation, collection, deodorising, and sale of such manures; the minor arrangements, such as the appointment of scavengers or nightmen, the depôt, and other requisites, can easily be made. The Act should embrace the principle of a comprehensive sanitary measure, combined with the most extensive and beneficial impetus ever given to the agriculture of this country.

INDUSTRIAL EDUCATION.—AGRICULTURAL CHEMISTRY.

The benefits to be derived by the agricultural class from the more general diffusion of scientific education have been repeatedly urged of late in this journal; and our numerous endowed schools have been pointed out as the best channels for the conveyance of such instruction. The principles of physical science are universal in their application. That rudimentary knowledge of the laws of nature, of which no man should be ignorant, and which will be useful to a youth designed for a farmer, will be equally serviceable to him in any other industrial occupation. The experience of the continent—where more attention has been paid to industrial education than with us—has proved the utility of attempts to teach the practice of any art at school. It is principles which must be imbibed there, to be applied afterwards to practice, on the farm or in the workshop. For these reasons, it appears less desirable that agricultural schools should be founded for one class, and schools of design for another, than that instruction in the elements of physical science and in drawing should be given in establishments common to all classes, in which each may have an opportunity of selecting for more extended study those departments of knowledge which are of most importance to itself.

From various quarters demands are arising for a reform in the present system of instruction, whether as administered in our parish schools in connection with the National Society, or in our Universities, where those destined for the learned professions study, and where those who are independent of a profession lounge away a few years, because it is the fashion. On all sides the necessity for teaching things as well as words is insisted on. Manchester and Birmingham are taking the lead in establishing a self-supporting system of education for the manufacturing population. In Cornwall a mining school is being founded, to be dependent on voluntary support. Lord Ashburton, as representing the more advanced portion of the agricultural body, has offered prizes to the pupils of the village schools in his neighbourhood, for proficiency in the knowledge of common things; and the leading organs of public opinion are pointing out that there are higher classes who need instruction in common things more than the rudest ploughboy. They assert, with truth, that none have less opportunity of acquiring this useful kind of knowledge than those youths who, commencing their education in our aristocratic public schools, complete it on the banks of the Isis and the Cam. The tenant far-

mers, and the generality of landlords who are most interested in the diffusion of knowledge among the tenantry, are perhaps the least alive to the educational question. What is the cause of this? Are they alone unconscious of their wants, or are they expecting the Government to do everything for them? Misled by the announcement of a Government School of Mines, do they expect that the Government will provide an Agricultural School for them without their asking it?

There is little doubt that, during the approaching parliamentary session, we shall hear the announcement by the Government of some general measure for extending the means of instruction, in which industrial education will hold the prominent place which its importance demands. There are, moreover, symptoms not to be mistaken that the proposed educational establishments are to be self-supporting. If assistance from the public purse is to be afforded, it will most probably be only temporary and conditional—temporary, to enable a school to sustain itself till it shall have root sufficiently to dispense with such aid; and conditional on the raising of an equal sum by local contribution. Should this be the case, the agricultural districts will only have themselves to blame if their educational interests shall be neglected. Once more, then, we urge them to a consideration of the importance of this subject; and once more we remind them that a stock of sound scientific knowledge, laid in by the sons of farmers in early youth, will not interfere with their acquiring that knowledge of farming which is only to be obtained by actual practice; and that, while such education will tend to make them better farmers than if they learned practice only, without principles, it will open to them many other avenues to advancement in life.

On the whole, we have little fear for the education of the rising generation in really useful knowledge. There is, however, a race of young men, who have arrived at an age too advanced to participate in the benefits of schools about to be established. For them there remains the resource of self-instruction; and they may console themselves with the fact that a man never learns anything so well as that which he teaches himself. *We would particularly recommend to their study the chemistry of agriculture.* Surely they must derive advantage from knowing the constituents of the soil which they cultivate, and the manures which they apply to it; of the plants which grow upon it; and of the animal produce of meat and wool, butter and

cheese, into which their vegetable produce is ultimately converted. For the acquirement of the elements of this knowledge, we know no work so well adapted as the "Catechism of Agricultural Chemistry," by Professor Johnston. We noticed on a former occasion the larger works of this sound and popular writer on this subject. To these his Catechism will be found a useful introduction, by those who are inclined to drink deeply at the springs of knowledge; while to those who mean to content themselves with less copious draughts it will communicate just that amount of information which no man in any station of life should be destitute of. Public approbation has set its seal to this unpretending little book. The introduction informs us that the edition recently published is the thirty-second; that it has been translated into nearly every European language, and used in the schools of Germany, Holland, Flanders, Italy, Sweden, Poland, and some of the states of South as well as North America. It is quite time that elementary instruction in the subjects of which it treats should be introduced into the schools of our own country, whatever the class of society from which their pupils may be drawn. Professor Johnston dedicates his work to the Schoolmasters of Great Britain and Ireland, as those who possess in higher degree than most men the power of promoting an object of so much importance to all. He observes—and the observation has more than ordinary significance at the present moment—that the land must be rendered more productive if food is to be grown *at home* for our increasing population; that the produce can be largely increased only by the application of increased knowledge to

the culture of the soil; and that it is the rising generation now in the course of instruction who must possess and apply this knowledge. The author expresses his belief that country teachers who may introduce this catechism into their schools will find no difficulty in making the elder classes understand the different subjects successively brought under notice; and he recommends that they should not be required to commit the very words of each answer to memory, but that they should be taught to make themselves masters of each, so as to give the sense of the answers in words of their own. Above all things, the teacher is cautioned that it is not chemistry, but scientific agriculture which he is to teach; and that to this idea all his teaching of mere chemistry must be subordinate. He is advised also to endeavour to satisfy the parents of his pupils in the rural districts that this kind of knowledge can be practically applied to their daily occupations, and has, therefore, an actual money value. The truths inculcated are illustrated by a series of experiments easily performed either by the teacher or the self-teaching student. Without such experiments it is a hopeless task to attempt to teach chemistry. The apparatus necessary for performing them is, moreover, cheap; and information is given as to where it may be purchased. No school, and no farmhouse where there are sons growing up, ought to be without this "Catechism of Agricultural Chemistry," and without the apparatus necessary for the performance of those experiments which will exhibit nitrogen, oxygen, hydrogen, &c., to the senses, and impress upon the memory their properties and their combinations.

THE EXHIBITIONS OF BREEDING CATTLE AND THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Few of us can have yet forgotten the many ills that attended the development of the Royal Agricultural Society's Meeting at Lewes. The dreadful heat of the weather, the exposed situation of the show-ground, and the consequent sufferings of the fat cattle exhibited—pigs and sheep reported to be dead or dying in the yard, and Herefords scarcely able to live through the two or three days' trial to which they were thus subjected. The unprejudiced observer could come to but one conclusion from such a state of things—that a show of very fat cattle in very hot weather was something of a mistake, if not something worse.

Fairly considered, taking the assumed object of the meeting as the real one, the result certainly looked like something worse than any mere error as

to the time or place selected for such a display. The noble President for the year took this view of the case, and denounced with his customary energy the continuance of practices that had tended so seriously to injure the character of these annual gatherings. His Lordship did more, too, than merely find fault, by actively giving his aid and influence to remedy the evil. To some extent it may be added, that even in one year his well-directed labours had succeeded. At the Gloucester show we found far less proneness to offend, and the national exhibition of breeding stock became for once that it professed to be.

It is true that the exercise of this corrective was attended with some little drawback and opposition. Reformation, however necessary or palpable in its

effect, too generally requires some time to accustom us to that alteration it introduces. The late lamented Lord Ducie's proposition could but gradually hope to win over those who had so long habituated themselves to that course it came to condemn. The first and, be it remembered, the most anxious trial was, however, encouraging enough; and the best friends of the Society might have honestly congratulated themselves on the visible improvement at Gloucester, in what had hitherto been one of the weakest points in their proceedings.

The best, as we will take to be the most active, friends of the Society appear to be inclined to do no such thing. In the new number of the *Journal* the stewards of the cattle report dead against the continuance of the over-feeding prohibition. They state that this department of "the show was unquestionably below the average of former years;" and that "whether palatable or not, this lower character was mainly attributable to the new regulation, it being well known that many of our first breeders refused to exhibit, not choosing to run the risk of their animals being disqualified from over-fatness."

Fortunately for both sides of the question, they go on a little further into detail, and proceed to show how and where this falling-off was chiefly remarkable. Thus, then, "in the Short-horn classes," though "some good animals were exhibited, the judges think [and this is carefully put in italics] *that the recent regulation as to examination by jury has tended to lessen the number of good animals shown.*" The Herefords, however, *were generally good.* [The italics here, and hereafter are our own.] The Devons *kept up their reputation, the heifers being particularly good,* and "the judges were of opinion that *the new regulation had not interfered with the show in this section of animals.*"

In sheep, though "the Leicester rams were not thought equal to former years," the Longwools were "particularly good." The Southdowns, "*as usual*"—that is—"very good." The new class of Shropshire Downs "*very successful.*" And "it is to be hoped," adds the report, "that the Society will recognize them as a distinct breed;" a suggestion in which we entirely concur. Whenever exhibited during the last year or two, the Shropshire Downs, as our own reports will confirm, have always been "*very successful.*"

"The show of pigs was *excellent.*" And here for the present we may stay our extracts—the horses, as we take it, being not much affected, yea or nay, by the new regulation.

Where, then, after all, is this lamentable deterioration in the character of the show? Where this unpalatable effect of the new regulation? The Herefords were *generally good*; the Devons *kept*

up their reputation. The Long-wools were *particularly good*; the Southdowns *very good*, the Shropshire Downs *very successful*; and the pigs generally *excellent.* It would almost seem that this prohibition was nothing more nor less than the emanation of some envious spirit, soured by the increasing celebrity of the Shorthorn tribes. Having himself neglected, or obstinately opposed them, it is thus that he would craftily retard their further progress. The scheme, too, has unhappily proved but too successful. The Shorthorns at once gave way before it; "some of our first breeders refused to exhibit," feeling, no doubt, how hopeless it must be to attempt to show a Shorthorn with anything like a chance of the customary *écât*, when in merely breeding condition.

In the face of any such supposition as this, how stands the real case? This new regulation, then, as to overfeeding, was proposed, and mainly carried out, by a nobleman now celebrated as the most successful breeder of short-horn cattle ever known. The result of his own experience, too, has amply shown that this kind of animal may be appreciated when only in breeding condition. We know that some, even after seeing the stock exhibited at Gloucester, thought on their visit to Tortworth the same week that the herd there looked rough and unpromising. They were kept on view, however, as they were kept in general—as breeding animals; and we all know the prizes they took, when the best judges of the whole kingdom came to appraise them under that same useful rather than ornamental appearance.

"The stewards have some suggestions to make with reference to the next show of stock." We only trust they may not too hastily throw overboard this new regulation. We are well aware that they have some prejudice to deal with; but we are sanguine enough to believe this may be conquered; and we turn to the first trial of the experiment as some inducement for its being further persevered with. Some breeders may insist that stock of any sort, to show favourably, must be fed up for the occasion; and that this can in no way ultimately injure their powers as breeding animals. This has been instanced in a variety of ways. It was only the other day we were gravely assured that a terribly over-fed bull, which took a prize at the Windsor meeting, was gradually trained down again after the show, so as to be fit for use in a little more than three months. It is almost a pity that so subtle a contrivance cannot be ranked as original. We fear it carries with it, however, but too evident appreciation of the conduct of that renowned commander who marched his men up the hill for the sole purpose of marching them down again.

We have heard also of another eminent breeder

of stock who bought very cheap a famously descended Short-horn heifer; the reason for his obtaining so good a bargain being that she had been fed too high for exhibition at some of our breeding shows, and it was strongly suspected that she would never breed at all. But her new owner was both a clever and an enterprising man: he starved and exercised her—had her driven about daily in the lanes and byeways—until at last she rewarded his perseverance with a produce. The moral here is evident enough. Fatten your stock, and then unfatten them; like the child who builds up his card house with the grand object of knocking it down again.

It may be said that it is impossible to prevent some animals accumulating a superfluity of flesh. We take this to be altogether exceptional. We believe, on the other hand, that the mode hitherto in vogue for showing breeding animals has encouraged all kinds of trickery in making them up, while it has tended much to injure their procreative powers. We hear of cows consuming far more milk than they produce; of sheep pampered up on every kind of foreign delicacy, until we come to be forcibly reminded of the worthy citizen who declared he must part with the pride of his homestead—the prize bull; he really could not afford to keep him. On some one enquiring why, he led off with these as the first items in the expenditure:

“He costs me something over two guineas a-week in seed-cake and sherry.” “What!” said the other, aghast; “you surely don’t mean to say you feed him on that?” “No, but I *do* the people who come here to see him.” We fancy some of our friends’ prize bulls live almost as luxuriously as this prize bull’s friends.

We have to lament the loss of Lord Ducie for many reasons. We can lament it honestly enough here. We cannot think, though, that he would have stood by any means alone in the endeavour to keep the breeding show of the Royal Agricultural Society to its real object. If we are not much mistaken, the excellent gentleman and high authority who now holds that office Lord Ducie did when this new regulation was first broached, thinks very much with his Lordship. It is but a few weeks since that we heard Mr. Pusey say, with a smile, in his “official situation as President of the Royal Agricultural Society”—“that, while the Smithfield Club had for many years encouraged fat cattle, the Royal Agricultural Society proposed to encourage breeding cattle, though he *confessed he could not see much difference between the cattle of July and the cattle of December.*”

Under his auspices, we may yet be able to carry out the distinction. The Rubicon is already crossed.

PARTIAL FAILURE OF THE TURNIP CROP.

We hear from many parts of the country complaints that the turnips are eating very fast away. It is not only the small thin crops, the stunted, and late, and insect-eaten, and drought-stricken plants, of which this unfortunate complaint is made. The finest bulbs are found to consume away with vast rapidity, and our overstocked markets are sending mutton down, when to prevent its rising, as almost every other article is doing, is to effect a positive wonder. The quantities of half-fattened sheep and cattle pouring into our fairs are all indicative that the turnips are really consuming, while the advance in cake, linseed, and all artificial food for the stock, shows that the feeling is prevailing in the agricultural mind to a very great degree, that the turnip crop will be consumed much sooner than the farmer could calculate upon, after exercising all his ordinary forethought in apportioning his turnips, and his stock to consume them.

And how is this? An ordinary observer satisfies himself with the fact. The tops are as good or nearly as good as usual. The aphid certainly did them a little damage, and flew off in October in

swarms of so called “cholera flies,” more to the injury certainly of the eyes than the damage of the bowels of our population; but this the plants certainly got over.

A minute examination of the bulbs of our turnip fields has satisfied us that there is a large percentage of our turnips with diseased tissues. It is neither every row, nor any given plot in a field, but odd bulbs here and there, strewed over the ground pretty generally, and varying from five to fifteen or twenty per cent. of the entire crop. The appearance is difficult to describe, almost impossible, in fact, without drawings, and still unintelligible without their being properly coloured.

We will, however, hazard a description, just sufficient to give an idea of the general type of the disease, so far as to enable our agricultural friends to detect it on examining their fields. The top, as we observed, is not much of an indicator of the disease—it is somewhat smaller, and possibly more curled than it is found in healthy turnips; but when the sheep cut off the cuticle, or when the turnip is sliced by the cutter, a series of

brownish and in some cases almost black crevices occur, as if the plant had been burrowed into by insects in a very systematic manner. Sometimes these burrows are confined to two or three, passing through the whole bulb of the turnip; sometimes a complete burrow is made on one part of the plant, either the neck near the leaves, or the setting on of the tap root; but in other cases the whole bulb is a network of disease—soft, brown, and resembling a sponge; fast going to decay; but still the burrows forming a more systematic network running far more parallel than the absorbent cells of the sponge. This is fast decaying; and the sheep, after eating off the skin of the bulb, and finding the disease, leave the whole of the conical interior in the convex, instead of the concave excavation, often left by the sheep. Or in cases where the turnips are sliced, these slices are left untouched, showing how very distasteful these decaying tissues are to the animals.

Another fact we must call attention to. Those who have used ordinary white turnips for the table, have complained that this year they are unusually bitter, and this perhaps the sheep find in an extreme degree in the diseased structures.

Our readers may remember that we intimated some fear of this last year, and then gave drawings of the diseased structures. The drawings still resemble the kind of disease, but not the degree. These were local: they affected parts only of the bulb, and seemed gradually to spread by little and little in the way of contact of one diseased portion to another. But this year the whole mass of the turnip seems simultaneously affected by a slight burrowing, which extends throughout the whole bulb at the same time. Nor can we trace any insect as the cause of this. We think it is some structural defect in the bulb, and not any extraneous attack, which is the cause of this diseased appearance.

Another difference from the malady of last year is,

that the top and exterior afford little or no indications of the ravages within. Last year the top was small and shrivelled, was stunted and evidently issuing from a diseased upper surface. The brown, semi-transparent skin showed the malady below—not unlike the unmistakable potato blight on the tubers affected with that terrific scourge; but this year, so far, there are few bulbs which show any external symptoms of the decay and destruction of organisation going on within, which is only discovered on breaking the skin. There are many modifications of this disease, and some will not quite answer to the above very general description; but the resemblance is so far correct as to be a guide sufficiently accurate to set observation at work.

We shall be glad of any facts on this subject from our readers; and when snow is on the ground the diseased surfaces will be far more easily detected. If they will inform us of any similar malady prevalent, and give the treatment of the land with a little of its previous history, we may get a few facts on which to found some general approximation to the nature and cause of the disease.

We have not yet observed the disease to any extent in the swedes, which is so far satisfactory. It is the white varieties in which it is by far the most prevalent. Nor can it be attributed to that fertile cause of decay in these plants, known by the name of fingers-and-toes, though the malady somewhat resembles the very last stage of that formidable malady, and we are particularly anxious that the two diseases may not be confounded.

We propose to enter upon that subject in a subsequent number, and as it has recently been investigated by the Highland and Agricultural Society of Scotland and by other parties, a good deal of light is thrown upon it. In the meantime, we shall be glad to hear that the present partial failure of turnips is not prevailing over a large extent of the country, though we almost fear such is the case, from what we have heard already.

THE TURNIP QUESTION.

SIR,—In an age of improvement and progression like the present, many old customs which were formerly thought good have been disbanded, and better and more economical ones introduced. This has undoubtedly been the case both in agricultural and manufacturing districts. It is, however, generally admitted to be a fact, that agriculturists, as a body, do not exert themselves with so much energy, and so readily embrace any new system, however good it may be, as the manufacturing classes.

Be this as it may, I think, sir, you will agree with me that, whenever any new system of improvement in

agriculture has been discovered and tested, and particularly if it is one which has proved valuable by considerably diminishing the cost of our foundation crop, it should have all the publicity possible in every agricultural district. Being a constant reader of the *Mark Lane Express*, and knowing it to be a paper which weekly suggests various improvements in agriculture, I take the liberty of requesting you to publish the following remarks upon a system of turnip growing, which is likely to prove a considerable saving to the farmers of Great Britain.

There is no crop over which a farmer spends so much

money and labour, and watches with so much anxiety, as the turnip crop. It is considered the foundation for a certain course of cropping; hence the necessity of obtaining that crop at the least expense, and with the most certainty.

The two contending systems at the present time are, I believe, the liquid-manure system, and the old one of drilling compost (composed of night-soil, bones, ash, &c.), or the dust drill and water drill. Mr. Pusey's experiment, published in the *Journal* of the Royal Agricultural Society, with a prize dust drill and Mr. Chandler's water drill, was an extraordinary conquest in favour of the liquid-manure system; that gentleman having obtained a much greater weight of meat with the water drill, and at much less cost, than by the dust drill.

I have myself, for the last four or five years, seen the two systems contested; and have always found the liquid-manure system much the cheapest and most certain. In two or three trials, where about ten cart-loads of farm-yard manure per acre, with eight and sometimes twelve bushels of partially-dissolved bones, together with ash and night-soil, were drilled, the liquid manure system, without any farm-yard manure, and only two bushels of bones dissolved with 84lbs. of sulphuric acid, and drilled with 400 gallons of tank manure, produced an equally good crop to that obtained by the compost.

This will, I know, appear strange to persons who have never seen the two systems contrasted; but it is nevertheless true. Indeed, I do not hesitate to say, after the different trials which I have seen, that two bushels of bones dissolved with 84lbs. of sulphuric acid, and drilled with from 300 to 400 gallons of *common water* per acre, will produce a crop of turnips equal to *fifty shillings'* worth of solid manure. At the present time I know of two or three crops of turnips, grown upon poor, cold, hungry, clay land, at a cost of from 14s. to 16s. per acre, with the water drill, which cannot be surpassed in the best turnip districts.

I think I have said sufficient to prove that the liquid manure system is more economical than the compost system; and I presume a very few words will suffice to prove that it is more certain.

It must be obvious to everyone that in a dry season the seed will vegetate sooner in a moist soil than in a bed of hot, dry soil, and in some cases dust, and also that as plants take up their food only in a liquid state, the manure deposited in a soluble form will at once be ready for the use of the young plant; while manures

deposited in a solid form require some time to become soluble. I have always found that turnips sown with liquid manure appear two or three days sooner than those drilled with compost; and I have never yet seen, even on the poorest land, a crop fail for want of support when drilled with two bushels of dissolved bones per acre, and diluted with water or tank manure.

Much has lately appeared in your columns respecting the price of guano; but it never appears to strike the writers that, while our vessels are fetching guano from abroad, we are letting the very essence of our home manure run to waste; which might be obtained at a much less cost than guano imported from abroad. I have not the least doubt that, if the liquid manure which runs to waste in our farm-yards, villages, and towns, could be saved and applied in a proper manner to the land, not only would offensive smells and unseemly sights be decreased, but the turnips of this country might be grown with more certainty for about one-half the expense. The old yard manure would then be used exclusively for corn crops, and thus put a stamina in the soil; which, instead of growing sickly wheats and other corn, requiring top-dressings of guano at spring, would produce good crops of corn without the aid of *foreign* manures. We should, under this system, require a smaller importation both of foreign manure and corn.

The meeting of the Royal Agricultural Society is to be held this year at Lincoln: Mr. Pusey, the tried friend of the farmers, is the president. No doubt the celebrity of Lincolnshire as an agricultural county, joined to the fact of having a thorough practical president, will attract many visitors. Those who spend a few days in the county will have an opportunity of seeing some farming, probably, as a county, equal to any in Great Britain; but a careful observer will see, even in the heart of the superior farming of Lincolnshire, the very essence of all manures silently flowing down some drain, or forming a pool of stagnant and offensive water.

The farmers of Lincolnshire have in this respect been in a state of lethargy long enough. If this should meet the eye of any of that class (which undoubtedly it will), let it arouse them; and let farmers, as a body, seize the opportunity (which Mr. Chandler has presented to them by the invention of a drill admirably calculated to distribute manure in a liquid form) of growing turnips at less than half the cost which many have been spending.

The importance of the subject must be my apology for trespassing so largely upon your columns.

Thurlby Grange, Yours obediently,
Aford, Lincolnshire. SAM'L F. KEMP.

CROYDON FARMERS' CLUB.

On Saturday, the 14th January, the monthly meeting of the above club was held at the King's Arms; J. Cressingham, Esq., in the chair.

Mr. STREETER brought forward the subject, viz., "On certain Agricultural Subjects from which benefit would be derived by the Co-operation of Scientific Men with Practical Farmers."

I am but too sensible of my inability to do justice to the subject, or to engage the attention of the gentlemen now present so much as has been done by those who have previously so ably brought forward papers of a more practical nature; but having been called upon by the committee to bring forward a paper on some subject, I have chosen the above title from the

conviction that there are many matters which, if the attention of scientific men were specially directed to, they would devote their knowledge and time to the elucidation and discovery of the objects required of them. I believe few farmers will now call in question the propriety of enlisting the aid of science in many of the departments of agriculture—indeed, I consider there is scarcely a science from which agriculture may not derive benefit; but it is only practical men who can apply, carry out, and make use of those discoveries with profit and advantage to the public and themselves; and so impressed were those talented originators of the Royal English Agricultural Society of its truth, that they adopted for their motto that pithy but most comprehensive sentence, "Practice with Science." I will now call your attention to a subject which, if it were thoroughly investigated, might lead to the discovery of the cause and also the cure of the total failure of the clover plant on almost all soils after a few repetitions of the four or five-course rotation of cropping. There may be a few soils which seem peculiarly adapted for its growth, and on which it flourishes still, though repeated every four or five years; but they are few and far between, and have not come under my observation. Should any such fields be known to any gentlemen here present, I hope they will inform the club of the nature of the soil, subsoil, the length of time it has been under the plough, and the locality. When we consider that there is no herbage plant with which we are acquainted of such general and universal cultivation in these islands that produces so much good and nourishing food for stock, and at so little cost, and that none robs the land so little, even when mown twice for hay, there can be no question about the immense importance to agriculture if a remedy were discovered that would enable us to sow it oftener than we at present can do, and thereby assist the farmer to increase the fertility of his farm by drawing a portion of the ammonia or nitrogen from the air for the production and increase of the cereal crops, which the turnip crop is enabled to do in a similar manner by the addition of superphosphate of lime. Indeed, so far from the clover plant robbing the land, science has shewn that the observation and experience of a few practical men more than 80 years ago was correct. Their attention was drawn to the fact that a better crop of corn was produced when two crops of hay were mown and removed from the land than when the clover had been depastured by cattle or sheep. The explanation for such a result, so contrary to what might have been expected from the removal of so large a produce from the soil, was attempted to be explained by the shade it afforded to the land and the droppings of the leaf. Most farmers then doubted, and many still doubt, that the land is left in better condition for growing corn; but most of us, I think, must have observed that where the clover has failed in parts or spots of a field the following crop of corn has not been so good or strong as where the clover was a good plant. However, some years ago, that celebrated scientific French chemist and practical agriculturist, Boureicault (whose work on "Chemistry of Agriculture" Mr. Lawes tells us has not been sufficiently appreciated in this country) set the question at rest by experiments in the laboratory, and other experiments in the field, on a large scale, by which he satisfactorily explained why and how it was that the land was, and naturally should be, left in better condition for producing corn than when the clover was depastured by stock, and their droppings left in the field, whilst the two crops of hay removed from the soil were profitably used in the yard for feeding stock and producing other manure there; or which, on our sheep stock farms, would be producing mutton and wool, and the manure left in the fields where it was wanted without requiring any further labour. His explanation is this, that clover, sainfoin, and the

leguminous tribe of plants in general, to a considerable extent, have the property of assimilating or converting the nitrogen of the atmosphere into their own substances during the growth; that is to say, the ammonia, which we are taught to consider so essential to vegetation, is not all exhausted from the soil by those plants, but that a considerable portion is derived from the atmosphere; and why clover should in practice excel other grasses in this respect for our advantage is this, when it is suffered to grow, and be mown twice for hay, the roots increase in size and length, and arrive to a much greater weight per acre than when depastured with stock, and a considerable quantity of nitrogen is deposited in the roots, which, by their decay, furnish that element so necessary and indispensable for the production of heavy crops of corn. The same observations will apply to sainfoin in an equal degree, only that it is not adapted for such general cultivation as the clover; but it is a plant which draws largely on the atmosphere for its nitrogen, and, like the clover, on all thin soils, will not flourish if repeated again sooner than from 15 to 20 years, under the ordinary mode of cultivation, and then it will not last so long or flourish so well as it did the first time it was sown, provided it was then allowed to stand until it was worn out. Various have been the remedies suggested for the land when "clover sick"—Gypsum, lime, closing the land, and various other remedies; but the only practical remedy or rather expedient hitherto adopted which is at all successful is the system of not sowing it oftener than once in eight years, and then except on soils favourable for the growth of clover and the leguminous plants generally. The crops are not so luxuriant as they formerly were, notwithstanding the higher state of cultivation and condition in which our land now is; the truth of which is satisfactorily shown by the increased average produce per acre of the cereal crops. Now we will come to the consideration of the cause of this failure, for generally speaking the readiest mode of curing any evil is, first to endeavour to ascertain the cause of it. First. Is it caused by any insect? the increase of which is promoted by the repetition of the crop too frequently, and which may be engendered or find on asylum in the decaying and deep-seated roots of the clover? I think, where insects have been found on the dying plants, it is far more probable that they have not been the cause of their dying, but are there in consequence of their being in a dying state. Secondly. Is the failure caused by the exudation of some feculent matter from the roots? which has been asserted by some scientific men to be the cause, and which being taken up by the roots of the young clover plants causes their disease and death, which exudation or poisonous matter requires several years before it is dissipated or becomes harmless? That this is the cause seems scarcely probable, because the same exudation must take place from the roots in those fields where it is grown, or flourished longer without showing any symptoms of failure or unhealthiness in the plant, than it does in those fields which fail sooner growing it. Thirdly, and to my mind by far the most probable cause of the failure of the clover and other plants of the like kind when repeated often is, that there is some element or elements which enter into the composition of the clover and other plants of the leguminous tribe, which has hitherto escaped the analysis of all our chemists, and which requires some years before it is replaced on the soil in sufficient quantity, either by the addition of manure, or from natural causes if it be already in the soil, before it becomes in a fit or available state to be taken up by the roots, without which the plant cannot reach maturity or perfection. When it is considered that chemists have ascertained that the number of elementary or simple bodies in nature amount to between 50 and 60, of which number the analysis of plants has detected only about

14 in their composition, of which the inorganic or earthy elements are about 10 in number, and that they severally vary in quantity in different species, and also in the different varieties of the same kind of plants, and that two or three of these elements cannot be detected at all in some plants, which are to be found in others of a different species—it is by no means unlikely that the failure of the clover is occasioned either by the abstracting from the soil of one or more of those elements not hitherto recognized by chemists as entering into its composition, or it may be caused by a deficiency of an element already known to enter into its composition not being in a fit state to be taken up by the roots, though there may be an ample supply of that element in the soil, but combined, perhaps, with some other element, and which requires time for the slow solving process of natural causes which are always in action, before it can be produced in sufficient quantity for the next crop of clover to come to perfection. But, whatever the cause may be, I think it will be admitted that the assistance of scientific men in this matter is much wanted. It may be considered presumptuous for practical farmers to point out the way in which any experiments should be conducted; but we may be allowed to offer any ideas that strike us for their consideration, and make known any observations that we have made, connected with the object now before us. Perhaps the most satisfactory and readiest way of solving the difficulty would be by following the method so successfully adopted by that most talented practical agricultural chemist, Mr. Lawes, of Rothamstead, in those admirably-conceived experiments on the growth of turnips and wheat carried on in the field, by which he demonstrates to conviction the conditions of the soil and the several manures requisite to produce profitable crops of each, and their mutual relation to each other in the course of rotation, which may be found in a paper by Mr. Lawes, published in the Journal of the R. E. A. Society, vol. xii. part 1st—a paper from the perusal of which no farmer, however unexperienced he may be, can rise without feeling that he has increased his knowledge of the economical application of the special manures most required by any crop he may wish to cultivate. But although no rent-paying farmer can effect an experiment on so large a scale as Mr. Lawes, still every one of us, though ignorant of chemistry, may perform an experiment on the subject at a trifling expense of either time or trouble, and Nature would furnish the answer whether our applications of the remedy sought (in the state or form we applied it) was successful or not. The plan I would suggest is this: In any field in which we purposely omitted sowing clover, on account of its being “clover sick,” we could sow only a few rods of it with clover, in addition to the other grass seeds sown over the rest of the field, and then if it failed there would be no loss or inconvenience arise. That portion sown with the clover might be divided into two, three, or four parts, one of which should receive no application whatever; the other portions might then be dressed with any mineral or other manure which might suggest itself to the mind of the person trying the experiment: and here the scientific man might come to our assistance, and aid us by the information of what minerals, and in what form it would most probably be useful to apply them, and where they could be got at the least expense; and he would be guided in the information afforded by his knowledge of the composition of the soils on which clover flourished the longest without failure, and he could analyze the roots of those clover plants that were dying away in the spring, and ascertain whether there was any deficiency of the known elements, as compared with the roots of healthy and flourishing plants at the same period of the year. When I commenced this paper, gentlemen, I had no idea I

should have trespassed on your patience so long; but I will now conclude with one observation which has struck me in relation to the failure of the crop I have referred to, and that is, I have frequently noticed where a field has completely failed and died away, yet the plant has remained healthy and flourishing on the headlands, and perhaps a few yards from the hedge. Have the leaves which have blown from the hedge yearly had anything to do with this result? and has any gentleman present noticed the same in open fields where there are no hedges, and where the headlands have been under the plough as long on the rest of the field? One more remark, and I have done. Does any gentleman know whether gypsum has been applied to the young clover immediately after harvest, and with what effect as to its dying away in the following spring?

The CHAIRMAN said that the lecture had treated of a very important subject, and he thought they must look to the union of scientific and practical men to provide a remedy for the evil complained of; for it was by the combined efforts of those two sources they must look for ultimate utility and improvement.

Mr. FARLEY said he had paid attention to the subject for some years, and it was a very important one; but he found that he had always failed. If clover was sown more than once in eight years, it was a very singular thing if it came up: it did come up sometimes, and went on well for a time, and then it suddenly disappeared, and no one knew how or where; but he had noticed, in nine cases out of ten, that where it had failed in the field it had been good in the headlands. Whether it was a minute insect, or that at a certain period of its growth it required a certain element that it did not obtain, he could not say.

Mr. WALKER: To what do you attribute the cause of its being better at the headlands?

Mr. FARLEY: I cannot say; but not to its being better manured, certainly; nor do I think it is owing to any difference in the field.

The CHAIRMAN: Was it owing to one part of the field being better than the other?

Mr. FARLEY: No.

Mr. RUTLEY spoke in favour of subsoiling. He had, in two or three instances, obtained a very heavy crop after doing so; but he had not procured it oftener than once in seven or eight years.

The CHAIRMAN: If the deficiency had been in the middle of the field, it might have been supposed it required something which the skill of a chemist might supply.

Mr. CASTLEDINE: You want to have the scientific man to supply some deficiency every four years.

Mr. WALKER: The great point we want is to ascertain the cause.

Mr. CHURCHER: We want the aid of the scientific man to assist us: it seems too mysterious for us to find out.

Mr. ROWLAND said, the subject had been discussed years ago for the purpose of endeavouring to ascertain what could be the cause of the singular fact; but he was not aware that any one had found a remedy.

Mr. WOOD: It is singular our scientific men have not found out the cause.

Mr. RUTLEY, in reply, said he had ploughed about seven inches, and subsoiled about three inches below.

Mr. BATES said his experience had been the same as mentioned—viz., that he could not get a crop oftener than once in seven or eight years; but he had not noticed that difference between the headlands and the other part of the field.

Mr. FARLEY: It is very important if we could find out

whether any chemical manures would restore that to the soil which the plant requires; for it seems evident the cause of failure is, that something is taken out which is in some way restored by Nature in eight years.

Mr. WOOD said, Mr. Tummins had last year, on Beddington estate, obtained a remarkably fine crop of clover; but no clover had grown upon it for 12 or 14 years.

Mr. FARLEY said that, although they could not arrive at any practical resolution from this discussion, he hoped some good might arise from it.

A vote of thanks was unanimously carried to Mr. Streeter for his able lecture, and also to the Chairman, which being responded to, the meeting broke up.

IMPORTANT TO THE FARMERS.

The following communication from a correspondent appeared in the *Scotsman*, upon the cycle of the seasons, and which will probably interest some of our readers engaged in agricultural pursuits:—

‘The uncertainty of the weather’ has been a subject of complaint to the husbandman from time immemorial. Science has shown, however, that law and order prevail in many phenomena once deemed to be under the blind dominion of chance, and ingenious men have indulged the hope that a key might yet be found to the irregularity of the seasons—not that we shall be able to prognosticate whether any particular day or week will be foul or fair, but that we may have rational grounds for expecting a good season or a bad one, or a series of good or bad seasons. Intelligent farmers generally believe that a course of abundant crops is pretty sure to be followed by a course of deficient ones; but whether the cycle of good and bad crops is of a determinate or a variable length, and if determinate, how many years are required to complete it, are points upon which opinions differ widely, and certainty is perhaps despaired of.

‘A paper read a few days ago by M. Becquerel to the Academy of Sciences, on the culture of wheat in France, supplies statistical facts of some value bearing on this subject. They show that there is a periodicity in the recurrence of good and bad harvests; that five or six years of abundance, and five or six of scarcity, follow each other pretty regularly. From want of capital and enterprise, and good means of internal communication, the French are more dependent on their own harvests than we are in this country, and the difference between a good and a bad year telling more strongly on their markets, serves better to test the influence of the seasons. M. Becquerel quotes from Count Hugo the following table of the average price of wheat for all France:—

	Francs per hect.	Shillings per qr.
1816 to 1821—period of scarcity.....	23.66	54s. 5d.
1822 to 1827—period of abundance....	15.80	36s. 4d.
1828 to 1832—period of scarcity.....	22.00	50s. 7d.
1833 to 1837—period of abundance....	16.16	37s. 2d.
1838 to 1842—mixed period.....	20.31	46s. 8d.
1843 to 1847—period of scarcity.....	25.68	59s. 0d.
1848 to 1853—period of abundance....	16.68	38s. 4d.

We arrive at a similar result by comparing the imports and exports of wheat, and taking the excess of the one over the other:—

	Hectolitres.
Scarcity.. 1816 to 1821... Excess of Imports..	6,247,000
Plenty .. 1822 to 1827... „ Exports..	1,258,000
Scarcity.. 1828 to 1832... „ Imports..	9,528,000
Plenty .. 1833 to 1837... „ Exports..	944,000
Mixed .. 1838 to 1842... „ Imports..	1,126,000
Scarcity.. 1843 to 1847... „ Imports..	18,697,000
Plenty .. 1848 to 1852... „ Exports..	13,188,000

‘The hectolitre contains 22 imperial gallons, or three hectolitres are a trifle more than a quarter. It will be observed that the importation of wheat in France, in years of scarcity, is very small when compared with ours. Thus, in the period from 1843 to 1847, while wheat averaged 59s.—a very high price in that country—the whole imports in the five years were only 20,161,000 hectolitres, from which, deducting 1,164,000 of exports, there remained for consumption only 18,697,000, or 6,400,000 qrs. In the period of scarcity, from 1816 to 1821, when the price was 54s. 5d., the imports were only 6,247,000 hectolitres in six years, or about 345,000 qrs. annually.

‘The five years from 1847 to 1852 were years of abundance both in France and Britain. Supposing, then, that the change takes place quinquennially, we should now be at the commencement of a period of scarcity, and that the present year fulfils this character is manifest from the state of the markets on both sides of the Channel. The French average for the first two weeks of November, as given in the *Moniteur* a few days ago, was 29.97 per hect., or 68s. 11d. per qr.—a famine price in France; and the British average for the whole of November was 71s. 1d., marking rather severe dearth. It is, therefore, a question of some importance, whether we are to regard the present deficient crop as a pure ‘casualty,’ an evil which an opposite casualty the next year’s abundance may redeem, or as the first of a series of bad crops. In our opinion, the hypothesis of a five years’ cycle, embracing the latter conclusion, though not established beyond challenge, has a sufficient probability to render it worthy of entering into the calculations of farmers, corn merchants, contractors for public works, and even ministers of state.

‘A hypothesis offered to explain anomalous or seemingly discordant physical facts is more readily accepted when we can trace in it the operation of some physical cause. In the *Scotsman* of the 6th of September, 1845, we gave an account of a memoir published by Schwabe, a German astronomer, on the spots of the sun, in which he maintained their periodicity—that they increased for a certain term, then diminished for an equal term, and that the interval between the maximum and minimum was about five years, so that the cycle was complete in about ten. This conclusion rested on the observations of eighteen years, which (as Colonel Sabine informed the British Association at Belfast) have been since extended to twenty-six years, and with the same result. Now, as the light and heat of the sun are obviously essential to the success of grain crops, it occurred to Gautier, a French or Swiss man of science, to compare Schwabe’s cycle of the solar spots with the results of the harvests in France as shown by the price of corn; and he found that, taking the years in groups, to eliminate accidental influences, those in which the sun had few or no spots coincided with years of abundance, and those in which the spots were numerous with years of scarcity. We have here, then, a glimpse of a physical cause to account for these alternating periods of scarcity and plenty, which experience has forced

upon the attention of our farmers. It is true that the spots of the sun cover but a very small portion of his surface at any time, but the decrement of heat in a bad year is also small compared with the whole quantity which the earth receives from the sun; and it is not improbable that, besides causing a direct loss of light and heat proportioned to their size, spots when abundant may indicate a general enfeeblement of the heating and illuminating power of the whole surface of the sun.

"The progress of science is constantly adding to our knowledge of the latent ties which connect the most distant parts of nature. Those minute deviations from the normal position of the magnetic needle, called its diurnal variation, were discovered a hundred years ago, and gave plain indications of

solar influence. It was only known within these few years that these variations were themselves subject to variation—were greater in some years than in others—and that another class of phenomena, called 'magnetic storms,' sudden and seemingly unaccountable disturbances of the needle, disclosed themselves. It is now found that these are periodical also. To use the words of Colonel Sabine, 'there is a periodical variation or inequality affecting alike the magnitude of the diurnal variation, and the magnitude and frequency of the disturbances of storms, and the cycle or period of the inequality appears to extend about ten of our years, the maximum and minimum being separated by an interval of about five years.' Perhaps by-and-bye the hopes and prospects of the husbandman may be read in the vibrations of the compass?"

CULTURE OF MAIZE.

SIR,—Allow me to call attention to the enclosed notes on the cultivation of Maize. They are the work of one of my pupils—Mr. Berkeley Hill, of Stapleton—and are, I think, worthy of some notice. The experiments were very encouraging in their result.

Yours, &c.,

THORNTON J. HERAPATH.

Bristol, Jan. 17.

The sort I have tried is the one recommended by Mr. Keene, which he calls the "Forty-day Maize," from its flowers appearing about forty days after sowing. Mr. Keene introduced this variety from the northern side of the Pyrenees, where it is cultivated, and where the summers are short and wet as in our own country.

Mr. Keene directs the seed to be sown about the 24th of May; if sown earlier, the crop is liable to be checked by late frosts, and it is a plant which does not easily recover itself after injury. A sure proof of the earth being warm enough for its reception is the appearance of the ground beetle, or cockchafer. Mr. K. says, "when the cockchafer appears, then sow your maize."

I find that if the weather be mild, it is advisable to sow earlier, although it may even be sown later, as some I sowed as late as the 1st of June ripened its seed by the 12th of October; but it required to be dried artificially before stowing away.

In April, 1852, I determined to try Mr. Keene's maize, as a friend living near London had succeeded in ripening some in an unsheltered spot. I therefore procured one cobb, which was sown in the open air on the 24th of May of that year, and it was with the seed obtained from that crop I tried my experiments this year.

The piece of ground I selected was situated in a garden with a south-western aspect: though not under a wall, or other protection, it was warmer than the open field would be. The whole piece measured two perches. My first sowing was on the last day of April, dibbling in the seed at two inches apart in rows three feet asunder. This, however, I found was a great waste of seed, as it became necessary, as the plants grew, to thin out from time to time the weakest, until the plants remaining were a foot or eighteen inches apart. Half of these were manured with superphosphate of lime, dibbled in with the seed, and half with guano. The superphosphate-manured appeared above ground in about ten days, while the guano-manured did not appear for more than a fortnight; those manured with superphosphate, moreover, were finer and more vigorous plants, ripening their seed sooner.

My next sowing was about the 24th of May; without manure, though the ground was tolerably good. I dibbled these two inches apart in rows, a space of eighteen inches being left between the rows. These I subsequently thinned by degrees

to eighteen inches between each plant. These came up seven days after sowing. When the plants were three to six inches high, I divided the plot of ground into about four equal parts, which I top-dressed with the following manures:—1st portion, with guano; 2nd, with superphosphate; 3rd, with defecated sewage (Herapath's patent); 4th, peat charcoal saturated with the drainage from a stable—giving each portion an equal bulk of manure. A fifth portion was left unmanured.

I found also that the plants manured soon recovered from the attacks of slugs, &c.; while the unmanured were greatly retarded by their ravages.

My third and last sowing was on the 1st of June, the plants being treated in the same manner as the second. These, however, I manured with superphosphate and peat charcoal manure, applying the superphosphate first when sowing, and the peat charcoal as a top dressing when the plants were three inches high.

When the plants were six inches high they were ridged up with earth, in the manner followed in ridging potatoes; and the operation was repeated when they were a foot or eighteen inches high. This was necessary to prevent their being blown down, as they are very top-heavy when in flower. If the soil is drawn up round the roots, they soon become firmly established, as new roots spring from each joint when the joints are covered.

As the cobs, or female flowers, sprouted from each joint, I stripped off all but one or two, generally leaving the highest, as too many cobs weaken the plant.

When the tassels of the female flowers become withered and dry, I cut off the male flower, or feather at the top, leaving one leaf above the cobb to draw up the sap.

During this time I kept the ground clean by frequent hoeing, and cleared away all shoots from the roots; and this was all the attention I paid it until the seed was ripe.

The crop may be left out till the end of November without taking any injury, as the cobs are so thickly enveloped with leaves that no rain or frost can penetrate to them.

The shoots stripped off are nauseously sweet, tasting very like liquorice, and cattle are greedily fond of them. I gave a small quantity daily to carriage horses in full work with good effect, as they are not so washy as vetches and green oats.

In America many favourite dishes are made from the green cobs. One prepared by frying them in butter is, I am informed, a very good one, though I have not tried it.

If this cereal can become acclimatized, which I see no reason to doubt after its having ripened last wet summer, I should think it would be valuable in places where owing to a wet winter the land is not cleaned soon enough for spring wheat. It will doubtless be found to be a serviceable addition to our green crops, as it may be cut in six or eight weeks after sowing, and as it also comes in during the hay harvest before grass is plentiful. It must be moreover observed that it makes capital hay when dried like meadow hay.

THE MANGOLD WURZEL, OR FIELD BEET.

We are amongst those who advocate incessant change in agricultural production. The best system of breeding, of fattening, of crop growing will in time wear itself out, and become the least instead of the most profitable. Granted, that the four or the five, or any other course shift, is best, we may carry it out in all its details until it becomes disadvantageous and unprofitable. And just in the same manner we may feed an animal on the best food—may select that which chemistry shows to be the very best, and what the animal's appetite indicates is equally palatable, and yet it will droop and sicken and stall, instead of feeding it. Take cabbage, for instance, the most nutritious, or cake; or take carrots, the most palatable, and confine an animal to any one of these, and we shall find it make less progress than one fed on a *variety* of less nourishing or enticing food. Then, look at the effect of the frequent repetition of any one crop on the soil. The turnip sickness—the clover sickness—the root-welting of wheat—the failure of beans, are all more or less due to the want of change, either in the system of growing these crops on given farms, or to the system of growing them at least throughout the area of the island.

But still we are no advocates of hap-hazard farming. We insist on *system* as a necessary concomitant of all success in the culture of the soil, the feeding of animals and their rearing and breeding. *We want a system of change.* We want the same crop removing from its like as frequently as possible; we want the changes of food ringing between one week and another in fattening animals, and we need judicious selection, and in some tribes judicious crossing, in animals used for breeding purposes, or we shall never succeed.

And although we think the turnip is by far the best of all green crops, as the potato is infinitely the best table vegetable—although we see both quite indispensable, the one to good farming and the other to good eating—we are not prepared to say that, for a change, a better than either may not now and then be introduced, more suited to the soil and the stock—more fitted for the palate and the stomach.

The result of these remarks is to recommend the—partial, at least—introduction of field-beet, or mangold wurzel, into farm cultivation. On soils too strong for successful turnip cultivation this plant will arrive at early and vigorous maturity; and as the lighter soils are peculiarly suitable to the turnip,

so the stronger are as certainly suitable to the mangold. The soil is not only more suitable, but it is ripe much earlier, and can therefore be carted off and disposed of at a period when it is more likely the ground will bear the feet of the animals and the action of the cart wheels.

Then it is so valuable as a spring store of root food for the cattle and the sheep—nay, it is a great question if it is not more useful than that it is when even first secured; and we have no doubt it is much more palatable. Besides, when a whole half-year's dreary confinement to turnips or swedes is over, we see the avidity with which, before grass comes forward, they eat up the mangolds, or the advantage they derive from that root.

We have been particularly led to the subject just now by the perusal of a plan of cultivation of these by Mr. Deane, of Houghton Hall, in Yorkshire; and whose paper seems so valuable that we will try to find space for it *in extenso*, though somewhat long; but when we say that "his experience" of growing field beet, or mangold, is that he produces to the tune of thirty-four tons per acre in one case, and nearly twenty-nine tons in the other, and when he shows a balance, after paying rent, taxes, and labour, of some sixteen guineas per acre, we think it is a subject deserving the most serious attention of the cultivator.

He gives two cases—the cost of cultivation in the one case is £8 15s. per acre, and the other about eight guineas; and when from four-and-a-half acres of mangold he shows a profit, taking them at 15s. per ton, we think the question assumes a much more important aspect.

We give his estimates of cost, because they show incidentally his mode of production:—

HOUGHTON HALL HOME FARM, 1852.

	£	s.	d.	£	s.	d.
The first division contained two acres, which produced 68 tons of clean-dressed roots, quoting the lowest value at 15s. per ton.....				51	0	0
Deduct for 12 loads of manure laid on in the autumn, at 5s.	3	0	0			
Do. 12 laid on in the spring ..	3	0	0			
Do. 5 cwt. Peruvian guano, at 10s.....	2	10	0			
Do. 10 cwt. common salt, at 1s.	0	10	0			
Do. rent £2, taxes 10s., labour £6	8	10	0	17	10	0
Leaves a balance on 2 acres of				33	10	0

	£	s.	d.	£	s.	d.
The second division selected						
was 2½ acres, and it produced						
72 tons, at 15s., or.....				54	0	0
Deduct for 30 loads of farm-						
yard manure, at 5s.....	7	10	0			
Do. 2½ cwt. Peruvian guano,						
at 10s.....	1	5	0			
Do. salt, 5 cwt., at 1s.....	0	5	0			
Do. 3 cwt. Lawes' patent						
manure.....	1	0	0			
Rent, &c., £3 10s.; labour, £7	10	10	0	20	10	0
				£33	10	0

Which shows a total profit on the 4½ acres of mangold of £67.

Now while we would make all allowance for a favourable season, and for a price more perhaps than the roots are really worth to the farmer as a consumer of his own green fodder, still the fact is before us, and the expense of production is given in a manner which strikes us as extremely fair and candid. For though we have estimates of past cultivation varying from £9 10s. to £10 per acre, much depends on the rental value of the land and the

labour it requires; and though Mr. Deane does not take into account the labour of storage, and consequently the cost of getting the roots to be worth 15s. per ton, still, as he takes no credit for the leaves, we apprehend they will be worth little short of the cost of getting up, or some 20s. per acre.

We ought, however, to caution all growers of mangold to attend particularly to two most important particulars in its cultivation. The first is, always to use salt in the manuring of the land; and the other is, to be sure to take up, even at the risk of stopping the growth of the tubers, before the frost set in, otherwise the roots will damage and be ruined for fodder.

Mr. Deane's system is a most liberal one; he gives plenty of manure, of different kinds, and at separate parts of the year. We do not think any more perfect mode of root-growing can be adopted.

We recommend his practical paper to the attention of our readers, and take this opportunity of bringing out a treatise which otherwise might either be totally disregarded, or, at least, have a very limited circulation.

BASINGSTOKE ROOT SOCIETY.

The second annual meeting was celebrated by a dinner at the Angel Inn, on Wednesday, the 21st Dec., when, in the unavoidable absence of Melville Portal, Esq., M.P., W. L. Selater, Esq., of Hoddington House, took the president's chair; the vice-chair being occupied by W. L. W. Chute, Esq., of The Vine, supported by F. E. J. Jervoise, Esq., of Herriard House; R. Cottle, Esq., Mayor of Basingstoke; Charles Simmons, Esq.; Messrs. Knight, Neate, Vines, Reid, Downs, Nation, Cane, Rivers, Hunt, &c. The usual loyal toasts having been duly honoured, the Chairman proceeded to read the award of the premiums given by the society and Messrs. Sutton, of Reading, and Messrs. Page and Co., of Southampton, viz.—

Best four acres forward turnips, £2, to Mr. Hunt, steward to W. L. W. Chute, Esq.

Best four acres of swedes, £2, to Mr. John Cane, Cufauds Farm. Second best ditto, £1, to Mr. Rivers, Steventon.

Best four acres swedes, grown after tares or rye, £2, to Mr. Hunt, steward to W. L. W. Chute, Esq.

Best four acres backward turnips, £2, to Mr. Hunt, steward to W. L. W. Chute, Esq. Second best ditto, £1, to Mr. Rivers, Steventon.

Best four acres backward turnips, grown after tares or rye, £2, to Mr. Hunt, steward to W. L. W. Chute, Esq.

Best two acres wurzel, £2, to Mr. Hunt, steward to W. L. W. Chute, Esq.

Messrs. Sutton's premium for best two acres of wurzel, grown from their seed, £1 1s., to Mr. Hunt, steward to W. L. W. Chute, Esq.

Messrs. Page's premium for best two acres of wurzel, grown from their seed, £1 1s., to Mr. Hunt, steward to W. L. W. Chute, Esq.

Messrs. Sutton's premium for best four acres of sweder, grown from their seed, £1 1s., to Mr. J. Cane, Cufauds Farm.

Best three roots of wurzel, 5s., to Mr. Hunt, steward to W. L. W. Chute, Esq.

Best three turnips, 5s., to Mr. Hunt, steward to W. L. W. Chute, Esq.

Best three swedes, 5s., to Mr. W. Knight, Overton.

Best four acres of hoeing, 10s., to Mr. Hunt, steward to W. L. W. Chute, Esq. Second best ditto, 5s., to G. S. Terry, Esq., Dummer.

On the health of the successful candidates being given, W. L. W. Chute, Esq., in thanking the company, took occasion to observe the great and rapid advance that was being made in this particular branch of husbandry, pointing out the fact, from the evidence of the splendid roots on the table, of the capability of the poorest and strongest clays, under proper management, producing heavy root crops; and generously proposing, in conclusion, that a considerable portion of the amount of the premiums awarded to him should be placed in the hands of the committee for additional premiums next year.

The thanks of the society were cheerfully given to Messrs. Raybird and Curtis, the judges, and to the indefatigable honorary secretary, Mr. B. Hunt, of The Vine, to whose persevering efforts the success of this society, which has for its object the promotion of the growth of root crops, by determining on the merits of not less than an acre growing in the fields, instead of the old method of judging from a given number of roots brought forward at the annual meetings, may be mainly attributed.

THE TITHE COMMUTATION RENT-CHARGES.

The following table shows the money value of £100 tithe rent-charge, according to the seven years' average prices of wheat, barley, and oats; also the annual and septennial averages, upon which the tithe rent-charge has been calculated from the year 1835 to 1853:—

Years of septennial averages.	Average prices of grain per bushel for seven years.									Years of tithe.	Value of £100 in wheat.			Value of £100 in barley.			Value of £100 in oats.			Average value of £100 rent-charge.			Annual average price of grain per quarter.											
	Wheat.			Barley.			Oats.				£ s. d.			£ s. d.			£ s. d.			£ s. d.			Wheat.		Barley.		Oats.		Rye.		Beans.		P. as.	
	s.	d.	q.	s.	d.	q.	s.	d.	q.		£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
1835	7	0	1	3	11	2	2	9	1836	100	0	0	100	0	0	100	0	0	100	0	0	48	6	32	10	23	1	33	4	39	1	38	4	
1836	6	8	1	3	11	2	2	9	1837	95	10	11	100	10	6	99	19	11	93	13	9	55	10	30	4	23	1	34	9	38	7	37	6	
1837	6	6	1	3	11	2	2	8	1838	93	9	5	99	9	5	99	4	10	97	7	11	61	7	31	5	22	5	35	1	37	2	36	8	
1838	6	6	1	3	9	2	2	8	1839	92	17	6	96	6	3	96	19	4	95	7	9	70	8	39	6	25	11	42	0	41	3	41	2	
1839	6	9	3	11	2	2	9	1840	96	2	10	99	9	5	100	15	1	98	15	9	66	4	36	5	25	8	37	0	43	5	42	5		
1840	6	11	3	4	1	2	10	1841	99	8	1	103	3	1	105	6	0	102	12	5	64	4	32	10	22	5	36	9	39	10	10	4		
1841	7	3	1	4	2	2	11	1842	104	3	2	105	5	3	106	16	4	105	8	2	57	3	27	6	19	3	33	0	32	5	32	11		
1842	7	7	1	4	1	2	10	1843	108	12	1	103	13	8	104	10	10	105	12	2	50	1	29	6	18	4	30	7	29	2	31	1		
1843	7	7	1	4	0	2	9	1844	108	17	11	102	2	1	101	10	3	104	3	5	51	3	33	8	26	7	33	11	34	5	33	5		
1844	7	7	1	4	1	2	9	1845	103	0	2	103	13	8	99	19	11	103	17	11	50	10	31	8	22	6	32	6	33	11	33	8		
1845	7	4	1	4	1	2	9	1846	104	8	11	104	4	2	99	19	11	102	17	8	51	8	32	8	23	8	35	0	39	0	39	0		
1846	7	0	1	4	0	2	8	1847	100	5	10	101	1	0	93	9	8	99	18	10	69	9	44	2	28	8	19	0	50	6	51	5		
1847	7	1	1	4	1	2	9	1848	101	3	8	104	4	2	100	15	1	102	1	0	50	6	31	6	20	6	30	5	36	9	39	1		
1848	6	10	1	4	1	2	8	1849	97	12	5	103	13	8	99	4	10	100	3	7	44	5	27	9	17	6	25	8	30	2	31	2		
1849	6	7	1	4	1	2	8	1850	94	7	2	103	13	8	98	9	8	98	16	10	40	3	23	5	16	5	23	3	26	10	27	4		
1850	6	5	1	4	0	2	8	1851	91	13	9	101	1	0	96	19	4	96	11	5	38	6	24	9	18	7	25	6	23	7	27	2		
1851	6	2	1	3	10	2	7	1852	88	14	5	97	7	4	95	9	1	93	16	11	40	9	28	6	19	1	29	10	32	3	30	7		
1852	6	0	1	3	9	2	6	1853	86	1	0	95	15	9	93	3	7	91	13	5	—	—	—	—	—	—	—	—	—	—	—	—		
1853	6	0	3	9	2	6	1854	85	9	2	95	15	9	91	13	3	90	19	5	—	—	—	—	—	—	—	—	—	—	—	—	—		

The seven years' average of wheat, barley, and oats, which regulate the value of tithes, for 1854, are for the imperial bushel of wheat, 6s.; for barley, 3s. 9½d.; and for oats, 2s. 6¼d.

It will be seen by the above table that the averages for the seven years ending Christmas, 1853, vary but slightly from those ending Christmas, 1852. In wheat and oats the decrease is one half-penny, while the average of barley remains the same. It will also be seen that the yearly averages of 1846 are excluded, and those for 1853 substituted for them in the calculation, and as the rise in the prices of the present year have nearly approached the point which was reached in 1846, scarcely any change occurs in the septennial averages. Had the annual average prices of corn remained anything near what they were between 1849 and 1852, the value of £100 tithe rent-charge in 1855 would have fallen nearly 25 per cent. But the present high prices will arrest the progress of the decline; and although the high prices of 1847 will be excluded from the septennial averages in 1851, yet there is a great probability that the annual averages of that year will nearly reach, if they do not exceed, the prices of 1847; in which case the tithes will vary but little in 1855, from what they will be in 1854; though there is no probability that they will again reach such a point, as to raise the value of the tithe rent-charge to the height in 1843, when it was £5 12s. 2¼d. above par.

In the Circular of January 31, 1851, we showed that the annual average value of £100 tithe rent-charge was worth £100 16s. 7d. during the first fifteen years of the Tithe Commutation Act, from 1837 to 1851 inclusive; while the price of wheat declined 28 per cent., barley 23 per cent., and oats 29

per cent.—shewing the very anomalous position in which the farmer was placed.

It may, perhaps, be advanced that the operation of the Tithe Commutation Act rectifies itself. But this is not true; for it is impossible, while the value of tithes is measured by a septennial fluctuation, and the amount payable is made by an annual fluctuation, that the interests of the tithe owner can be identical with those of the farmer. Even had the corn laws never been repealed, the principle of the act itself is unjust; but the repeal of those laws has rendered it doubly so, and has placed in antagonism parties whose interests ought to have been united. It will probably be asserted that it is now the farmer's turn to enjoy the benefit, and that the tithe owner must bear his burden. But all legislation which affects the permanent interests of the country ought to be fixed upon such a basis as not to sacrifice the welfare of one part of the community for the benefit of the other.

The above table shows that, since 1849 the value of £100 rent-charge has not reached par, but has gradually declined, as may be seen by the following comparison of its value in that year with its value in 1854 in wheat, barley, and oats:—

	VALUE OF £100 RENT-CHARGE.											
	Wheat.			Barley.			Oats.			Average.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1849 ..	97	12	5½	103	13	8	99	4	10	100	3	7¾
1851 ..	85	9	2¼	95	15	9½	91	13	3¾	90	9	5¼

Decrease 12 3 3½ .. 7 17 10¾ .. 7 11 6¼ .. 9 14 2½

The greatest decline has been in wheat, owing, of course, to the greater proportion of that kind of grain being imported, while the actual value of £100 rent-charge has declined since 1849, £9 14s. 2½d.—Bankers' Circular.

FARM-YARD MANURE—ITS MANAGEMENT AND APPLICATION.

“Where there’s muck there’s money.”

The old adage quoted above is certainly a true one as applied to agriculture. “Muck is the mother of money,” is another homely maxim; and these are verified by the experience of every good farmer: good muck produces great crops; great crops produce much manure; much manure will produce more crops, and in greater variety; and so improvement goes on indefinitely. It is with the view of urging closer attention to the making, preservation, and application of farm-yard manure that I now make a few suggestions.

The Fold-yards.—These should be surrounded by the farm-buildings, or, if open on any side, they ought to be to the south. The bottoms should be close and compact, so as to prevent subsoil absorption of the liquid manure, and in form somewhat concave or “dishing.” The buildings must all be spouted to carry off surplus rains, otherwise the yards form cisterns for them to drain into. The more shed or hovel covering the yards possess the better, as the manure is always most valuable where made under cover. To cover every farm-yard is impracticable, but much might be said in favour of such an uncommon innovation upon old wedded customs.

The Making or Manufacture of Manure.—The design and aim should be to *make as much as possible* from every kind of product of the farm, and to *make it good*. For this purpose every particle of vegetable matter that can be collected from the farm should be brought to the fold-yard to be there converted into manure—nothing burnt, nothing wasted; even the very twitch itself forms a profitable foundation for the fold-yard accumulations; all ditch-roadings, hedge-trimmings, road-scrappings; strawy matters, of all sorts, must come to the fold-yard. The harvesting of every crop ought in some measure to be guided by the requirements of the fold-yard. A corn crop mown and stacked in its usual undiminished state will produce much more manure than if reaped, and the stubble is left for an unlimited period to rot and decay: it begins to lose bulk the moment it is cut.

To Make it Good.—The straw should be very carefully and with great regularity given to the yard stock, and in its consumption should invariably be with a liberal allowance of corn, cake, turnips, or other roots: the more stock and the more artificial food they consume the better for the manure. Other aids may be applied to enrich the heaping mass—such as night-soil, town sewage, and the like; seaweed; fish, of various sorts (particularly shell fish): the latter not only enriches the manure, but provides

a small supply of calcareous matter for soils requiring it.

Its Preservation.—This growing mass should be left undisturbed (except its daily but partial stirring by the stock of pigs in search of the stray grains and refuse turnips of the cattle) till near the time when it is required for use. About a month or six weeks before it is used, it should all be turned-over very systematically in layers about four feet wide, and in small well separated “fork-fulls;” the whole surface or top to be carefully levelled to prevent undue exhalations of its ammoniacal particles. In about six weeks the amalgamated mass will be in the best possible state for application to the soil, *i. e.*, it will be in its richest, most unctuous state of semi-decay, yielding ammonia for the soil to promote its fermentation, and a highly nutritious supply of food for the crop to be grown. It is, however, in many cases absolutely necessary to lead considerable quantities of the fold-yard manure to the distant fields of the farm in the winter season, to be in readiness for the turnip sowing, or other purposes. This is attended with much waste of manure; but, to make the best of it, these heaps should always be made by the carts being drawn upon them to deposit the manure, and to compress them as closely together as possible to prevent exhalation. In order to fix the ammonia in these heaps, they should always be sown profusely with gypsum as the leading proceeds: if this cannot readily be procured, a similar application of soot will answer nearly as well. As soon as a heap is finished, it should be rounded up and slightly covered with soil almost immediately.

Its Application.—The most judicious and profitable application of farm-yard manure is to promote the production of root crops and pulse crops. It is comparatively inapplicable to the healthy production of a corn crop on most soils, but on every soil it aids surprisingly the progress of both root and pulse crops. As a top-dressing for grass seeds or clovers it is very serviceable; but its chief value is obtained when applied to produce a root crop. A good root crop is the foundation of good husbandry—the forerunner of every other crop: it is the substance of good farming. A good root crop, *i. e.*, turnips, mangold wurzel, coleseed, or the like crop, produces much food; this produces much manure; and, not only undiminished but enhanced fertility is the result. Potatoes are extensively grown, and are a profitable root crop, but when sold from the farm are certainly an exhausting crop; but, if consumed thereon, the produce is returned for the most part to the soil in the manure, minus the

pork; and, like other roots, the returns are minus the mutton and beef, and also the carbonic acid gas emitted by the stock in consumption. The pulse crops are much benefited by dressings of farm-yard manure; and being tap-rooted they draw much of their food from the subsoil, and leave a considerable proportion of the dressing for the succeeding crop. I would here observe that it should invariably be applied to the soil in the richest state of semi-decay to which it can be brought, and it ought to be ploughed in at the time of application.

To the Root Crop.—Every root crop ought to have a well-pulverized and prepared soil—the finer the tilth the better chance for the early progress of the seeds. The mangold wurzel, the Swedish turnip, the coleseed; to which I may add, the varieties of the cabbage crops, should be put in upon the ridge system—the ridges to be from 24 to 27 inches apart. This is the very best mode of applying farm-yard manure: the deposit of the manure and the ploughing in may go on so simultaneously that none need be exposed to atmospheric influences beyond the hour; and rolling the ridges should take place immediately. Thus every portion is covered: it is thoroughly compressed into the mouldy soil precisely under the line for the deposit of seed, and, like a hot-bed, it quickly produces vegetation; the plants soon strike their roots into the line of manure beneath, and are at once out of danger and rapidly flourish. The varieties of common turnip, carrots, potatoes, &c.

are best put in “on the flat.” In manuring for these crops the greatest care should be taken to plough in the manure as speedily as possible after it is laid upon the land and spread; and it should further be put at the bottom of every furrow as the ploughing proceeds, by lads following the ploughman. Rolling to be done as for ridges, and be drilled or set without harrowing. For grass seeds or clovers the manuring may take place at any convenient and suitable time during the winter, and ought to be well brushed in immediately. If applied to the production of corn crops, I can only say the sooner it is ploughed in the better.

Quantity.—This must depend upon the fertility of the soil, and the supply of manure on hand. To produce first-rate crops the mangold wurzel, the Swedish turnip, the potato, the carrot, and the cabbage crops will require from 15 to 18 good two-horse cart loads per acre; the coleseed and the common turnip crops will require from 10 to 14 such loads; the grass seeds or clovers from 8 to 10 loads; and the corn crops from 8 to 12 loads.

The exposure which farm-yard manure is subjected to in many districts, both in the field and in the heap, cannot be too strongly deprecated: it is thus often rendered valueless—not a whit better than rotten stubble, nor worth the cost of laying on the field. In such management, and for such managers, we may reverse our motto, and say—Where there is *no* muck there is *no* money. P. F.

THE GUANO QUESTION.—VALUE OF REFUSE FISH AS A MANURE.

That “refining medium,” as the Society of Arts is called, has lately taken quite an agricultural tone. At one of the weekly meetings a highly decorous audience is favoured by the Tip-tree Hall balance-sheet, associated with a lecture on the advantages of liquid manure. At the very next we have Mr. Green eloquent on the merits of Pettit’s Fisheries Guano, and the national benefit that must follow from the discovery being carried out. Of the former of these we have already had occasion to speak. The opening paper in that instance fell dead, simply from there being none of those who heard it with any knowledge of the pursuit to which it referred. With Mr. Pettit we are happy to say the case was widely different. There were many gentlemen present well able to test not only what he advanced, but to offer further suggestions from their own experience as to our future supplies of manure. The result was a discussion as interesting and useful, as that of the week previous had been flat and ineffective.

The guano question is now, perhaps the greatest

difficulty with which the agriculturist has to contend. He is opposed to a powerful monopoly, and he yet would treat with that power in open defiance of every rule of supply and demand. As it is, we do not get anything like the quantity we require: we want a great deal more; but at the same time, we want it at a lower price. At the rate guano is, or has to this period been sold, we have been annually increasing our use of it—that is to say, we have readily bought up all with which this country has been favoured. Taking, then, an unbiassed view of the matter, regarding it, as it must after all be considered, strictly as a matter of business, is it likely that we shall obtain this manure on much better terms than we hitherto have done? Unless some new deposits be found more within our own control, is it probable—is it fair to ourselves to hold out any great hope that dealers will be able to offer us guano at a lower price per ton? If a man who made coats or boots saw that he could sell as many as he pleased to offer on his own terms, what kind of a reception

would he give the customer who came to beat him down?

"It is the better plan," says the essayist, "to meet our difficulties at once with a full front." Agreeing, as we do, with the precept, it is that we speak thus plainly. We have a monopoly to deal with, that has little sympathy with us, and that may, after all, but laugh at our humble petitions. In place, then, of proceeding with them, let us endeavour to make ourselves independent of so unaccommodating a trader. Let us turn to those nearer home, and see what they can do for us. An opposition, however limited in its character, or however inferior in its quality, may work more good than we might at first be inclined to admit.

Of the promise held out by Pettit's "fish manure," as it is now more properly designated, we have already had something to say, and that something certainly anything but against it. The scheme, in fact, speaks for itself. The value of refuse fish as a manure has long been recognized by our best farmers. It cannot, then, but become more valuable when the knowledge of the chemist is applied to its manufacture, or more fitting preparation for the purposes of agriculture. The two great difficulties, and those chiefly dwelt on at the meeting, were the cost at which this manure could be made up, and the dependence which could be placed on the supply of the raw material. A similar project, attempted, it would seem, some years since, was abandoned more particularly from the first of these two objections to its prosecution. Mr. Lawes, who sent a paper to the Society, and which was read at the meeting, thus puts this point in all its full force:—

"To explain, however, the conclusions arrived at, in reference to the use of the offal fish and refuse as manure, the following short statement of the process employed in curing the fish for food may be given:—Platforms project out into the sea, upon which stand the men who cure the fish. The fish are handed up from the boats, and the curers split them down with a knife, take out the back bone and the offal and throw it into the sea; and, having sprinkled some salt over the fish, it is removed and dried in the sun. The quantity of offal thus thrown away amounts to some hundred thousand tons. The question was not whether such matter, when properly prepared, would be a good manure—for of this there could be no doubt—but it was whether a manure could be prepared which would, in point of composition, supply certain constituents at a cheaper rate than guano and other manures already in the market. Looking at the question in this point of view, the inquiry showed that there were difficulties in the way of attaining such a result, which were sufficient at the time to lead to an abandonment of the idea of converting this refuse into a marketable manure. Thus, the fishing season is confined to a short period during summer, and time and labour are then so valuable that every man, woman, and child is employed in some process connected with the preparation of the cod as food. Indeed, so important is it that the population should not be occupied with other pursuits, that the cultivation of the

land is neglected; and the proprietors of the fisheries supply the people with food and other necessaries imported from other countries. Under these circumstances it was evident that, in order to convert the offal into manure, one of two things must take place—either part of those already employed in catching or curing fish for food must leave that occupation for the other, or a large number of people must be brought from elsewhere, and be maintained by the proprietor for the sole purpose of making manure. With regard to the first of these alternatives, it is clear that so long as a ton of dried fish would sell for much more than a ton of the manure, it could not be to the advantage of the proprietor to change the occupation of the people; for the cost of the fish itself, apart from that of the labour employed in preparing it, would be comparatively small, whilst that of the latter would be nearly as great to convert a ton of offal into manure as a ton of cod fish into food. On the other hand, to maintain a larger number of people on the island for the purpose of converting the offal fish and refuse into manure, seemed not likely to be profitable, unless the manure were to sell for a higher price than its composition and the relative value of other manures in the market would justify."

Mr. Caird, who was present, questioned rather whether a regular supply of fish could be insured, so as to warrant the establishment of anything like permanent manufactories. We are bound to add that these were by far the two weakest points in Mr. Pettit's case. There was, in fact, scarcely any other real objection to the project, while the answer to these rests plainly enough on its development. If its promoters have confidence enough to proceed, they need have but little fear of commanding a market.

The discussion, however, was not confined merely to the manufacture of this fish manure. It took another turn or two equally worth remembering, and brought out facts and suggestions that may render us gradually less dependent on any one certain supply. Here, for example, is a word or two in good season from Mr. Nesbit. He is answering Mr. Lawes, who it must be borne in mind is no very ardent advocate for a more extended trade in any kind of manure:—

"He had always looked upon fish manure as of great importance, and some years ago he tried some experiments, by which he found he could obtain a large quantity of oil and valuable manure from fish. He recommended it to many well-known agriculturists, and told them the supply of guano would not last more than a few years, whilst there was plenty of fish round their own shores. Mr. Lawes' objection to the use of the fish guano appeared to be that it would not digest chemically, and that, when dried, it would not act so well on the ground. Now, there had been large importations of late of a peculiar manure from South America; it was the dried flesh of animals killed at Buenos Ayres, principally for their hides. This flesh manure, though highly dried, was found to act well for wheat, and he had no doubt that dried fish would also act and give forth the ammoniacal and other properties required for the food of plants. He thought that if the fish guano could be obtained at a reasonable price, it would be productive of great results. Of the dried flesh, only about nine per cent. was ammonia; but it had been proved to be very good for wheat. Thousands of tons

of it had been used; but the supply had been interrupted owing to the disturbances in Buenos Ayres."

Mr. Dugald Campbell, again, said, that "some years ago Mr. Turnbull, of Glasgow, the proprietor of Turnbull's blue, produced in his manufactory a large quantity of muriatic acid, which he did not know what to do with. He accordingly took to buying up dead horses, and boiling them in the acid to a pulp, which was then converted into dry flesh manure, for which it was sold. He had seen specimens of it, and found it contained a large proportion of muriate and sulphate of ammonia." And Mr. Mechi stated "that Mr. Hudson, of Castleacre, having a few years since lost a large quantity of sheep, which he had imported, by small-pox, he had them decomposed into manure for turnips, and met with great success."

Here are fresh fields for the efforts of science and commendable speculation. It is pretty certain, too, that the most will be made of those opportunities we do possess. Day by day we have new manure-making companies announced, and nearly all with some claim on our attention. Their very object indeed, the end which would be attained by their success, should induce us to clear their way to it. We may so, as occasion offers, discuss in turn the merits of some of these—feeling how much they may conduce to insure the English farmer a regular supply, at a fair price, of those manures which "our narrow boundaries and worn-out corn fields" so essentially require.

Although we reported the "fish manure" discussion at length in our paper of last week, we must repeat that we think it of sufficient importance to return thus again to it. We may have more power in our own hands than we are as yet quite aware of. Speaker after speaker turned to the manner in which this might be developed, with some evident impression at the time, and some still greater that may yet follow. As Mr. Caird said in his letter to the *Times* only a day or two subsequent, "any increase in the price of Peruvian guano will bring into operation every attainable substitute, whether flesh from the great plains of South America, or refuse fish from Newfoundland, or our own coasts; or, better than either, it may stimulate science to eliminate, concentrate, and render portable the natural products of this great city, and convert a noxious nuisance into a perennial mine of wealth."

We know not yet at what price, or to what extent, we are to be supplied from Peru; but we do know that science is concentrating the natural products of this great city for the purposes of agriculture.

FISH MANURE.

At the meeting of the Society of Arts, on Wednesday, December 21, Mr. HARRY CHESTER presiding,

Mr. HORACE GREEN read a paper on Pettitt's "Fisheries Guano," in which he said—Guano, it is generally understood, was introduced to the notice of Europeans, by Von Humboldt, in 1804. It was brought to England as an object of merchandise in 1839. It had been used in Peru for six hundred years and upwards, and the island depositaries had been for ages under the management of the state. Its early history is too well known, through the lectures and essays of Professors Johnston, Way, and others, to need repetition. The only points of the evidence of the earlier witnesses on this subject to which we need now refer is that, even in those days, the flocks of birds, being disturbed by the operations of the traders, had begun to desert the islands, and the annual new deposits were regularly swept off for the home consumption of Peru. With reference to the early price: in 1841, Mr. Johnston, to whose papers every person interested in the question naturally refers, gave the price of guano as £25 per ton in this country, and not more than £2 5s. to £3 10s. on the spot; and having given an analysis, and calculated the price at which the same amount of fertilising matter might be added to the soil from the manufactories of this country (say £9 10s.), he deduced that the British farmer should not be called upon to pay more than £20 for his ton of Peruvian guano, and should certainly refuse to do so. Mr. Philip Pusey, then president of the Royal Agricultural Society, in a paper on the subject in the *Journal* of that body, also gives the same opinion, and without doubt the very rapid adjustment of the price to the sum of £9 5s. per ton may be taken as a prudent acknowledgment by the Peruvian agents of the very forcible nature of the Professor's argument. It would appear that, until the opening of the trade in guano, the Peruvians had confined themselves mostly to the use of the new deposits, and had used up annually, or nearly so, the supply provided for them, because we have not received from Peru any guano as rich as new deposit would be, nor indeed as is imported from Bolivia and other *entrepôts* of very minor capabilities; and the earlier imports, as being nearer the surface of the solidified deposits, were inferior to that which arrives at the present time. It is more than likely that solid masses, nearly in a virgin state, not having been cut into by the Peruvians, were attacked with pick and spade to load the earlier ships. As the work went on, the diggers arrived at harder strata, enriched at the cost of those above by the filtration of ages, and so consolidated as to require in some places the operation of blasting. Notwithstanding the conflict of opinions on this subject, it is generally believed that the zenith of supply from Peru is past. We are aware that there is an increasing demand, and yet there is a marked falling off in the import. We have seen the entire exhaustion of the Ichaboe islands in 1845, 1846, and 1847—a short space of three years—and we may therefore well turn attention to new sources of supply of this concentration of fertilising matter, before considering of home-made aids or substitutes. Of the 129,000 tons imported in 1852, 97,484 were from Peru and Chili, and 6,213 from Bolivia, or together, 103,697. The Bolivian guano is of excellent quality; it is, in fact, collected as it falls; there is not, therefore, the shadow of a probability of its being a material stop-gap should the Peruvian supplies run short. But for the other depôts little can be said. In the previously named places no rain falls, but in most of the

sources of the 26,000 tons unaccounted for, the virtue of the guano has been washed out by intense and long-continued tropical rains. Out of the many analyses of guanos, one or two may be presented to carry out the argument. We may avail ourselves with the greatest confidence of those furnished by Professor Way to the Royal Agricultural Society, and may safely trust to the acuracy of Johnston, Anderson, Teschemacher, and Nesbit. There appear to be Saldanha Bay guano, Patagonian, Australian, and East Indiau, of which last fresh deposits have been recently brought to the notice of the public. The per-centages of ammonia are as follows, being the means of several experiments on each variety:—

In Saldanha Bay	1.68 per cent.
In Patagonian	2.55 „
In Cape and Algoa Bay	2.00 „
In the new islands	1.96 „

But in phosphate of lime, which is the next most important element, these guanos are richer as they are poorer in ammonia. The mean amount of phosphate of lime is—

In Saldanha Bay	55.30 per cent.
In Patagonian	41.60 „
In Cape, &c.	20.00 „
In the new islands	62.80 „

And this will be the case in all guanos which shall be found where the rain falls upon the deposits, which never occurs in Peru. Now, as respects the position such guanos are likely to take as a substitute, or side by side with the Peruvian, there is but little chance of their being much used until the extinction of the supplies of the latter, except for the purposes of adulteration. There may chance to be large imports, but it is questionable whether, if imported, they will enter into consumption throughout the country under their true colours as phosphatic manures, or the disguise of Peruvian guano. It is more than probable that many of the practical farmers who now lay out a little money annually in guano, will continue to be guided, as at present, by the smell of the article, which a mere trace of ammonia is sufficient to provide for them; and they will possibly buy up the new islands of guano phosphate, if it may be so called, at a higher rate than they need pay for super-phosphate of lime manufactured at home from bonescoprolites, apatite, and phosphoric rocks. But the question arises whether or not large quantities of such manures can be brought and sold at a price which shall not exceed the home cost of super-phosphate of lime. This may be doubted, although Saldanha Bay guano has been sold at £4 10s., but not very extensively or direct, to consumers. There is a difference between the price first-hand from importer to dealer and that from the dealer to the farmer. Still the first importer will never get more than ¾d. or 1d. per lb. for his phosphate, at which price the English tradesman can manufacture it for his own use from the substances above named; and although some few ships might be found which would take in guano as ballast from the southern seas, &c., still it is hardly credible that the shipping interest would find it worth while to send vessels expressly on long voyages for an article which could not realise a higher price than that above mentioned. If this be true, it being also established by the labourers in the field of agricultural chemistry, that the wheat grower is to seek nitrogen in ammoniacal manures, which these new discoveries certainly are not, the conclusion only remains that the void in the supply of guano has yet to be filled up. Doubtless, the foregoing, among other considerations, led to the proposition

which emanated from the Royal Agricultural Society of England to give one thousand pounds and the gold medal of the Society for the discovery of a manure equal in fertilizing properties to the Peruvian guano, and of which an unlimited supply can be furnished to the English farmer at a rate not exceeding £5 per ton. Great doubts have been expressed whether any person who had made such a discovery would be induced, for a premium of £1,000, to guarantee the sale, in unlimited quantities, for £5 per ton, of an article equal in value to the Peruvian guano, which bears a market value of £9, and which, according to the Society's own scale, is worth intrinsically more money. As a matter of course the manure sold for £5 must be supposed to be made for less, and it is difficult to imagine that he who should for about £4 10s., become possessed of

388 lbs. of Ammonia, worth, at 6d.	£9 14 0
540 „ Phosphate „ 0¾d.	1 13 9
78½ „ Potass „ 2¼d.	0 14 8

Or, altogether

£12 2 5

would dispose of it for £5.

It is now proposed to describe the fisheries guano of Mr. Pettitt, discarding, for the time being, the question of its superseding Peruvian. Mr. James Caird, well known as the Agricultural Commissioner of the *Times*, has forcibly remarked that the number of acres of wheat in England is five millions, and that is exactly the number of quarters of wheat and flour annually imported; and that, by the application of 2 cwt. of guano to each acre, the deficient quarter of produce might and ought to be raised. Were this advice acted on to a very moderate extent, there would be evidently required 500,000 more tons of fertilising matters annually—a quantity which would give a fair field for all the guano dealers, all the manure inventors, and all the sewerage purifiers in this country. It appears needful, in illustrating Mr. Pettitt's proposition, to consider the following points or queries:—

- 1st. Can the fish guano be made of use and value?
- 2nd. Can the raw material, fish, be obtained in sufficient quantities?
- 3rd. Can the process be carried out at such cost as to leave a profit?
- 4th. Will there be a sale for the article when made?

To the first query, apposing the science of agricultural chemistry, as at present established, to be sound, the following analyses furnish an answer:—

ANALYSIS I.

By Professor J. Thomas Way, of the Royal Agricultural Society.

Analysis of a sample of manure from Mr. Green, received March, 1853.

	Per cent.
Moisture	4.28
Oily matter	19.78
Other organic matter and salt of ammonia	62.14
Sand, &c.	2.27
Bi-phosphate of lime, equal to 3.12 neutral phosphate..	2.11
Neutral phosphate, insoluble in water	0.61
Hydrated sulphate of lime	5.00
Alkaline salts and loss	3.81

100.00

Nitrogen 9.14 per cent.—equal to ammonia 11.09.

ANALYSIS II.

By Professor Way.

Analysis of manure (No. 201) from Mr. Horace Green—received 29th March, 1853.

	Per cent.
Moisture	4.93
Oily matter	3.42
Other organic animal matter and salts of ammonia.	84.94
Sand, &c.	1.35
Phosphate of lime	0.39
Phosphate of potash and sodium, with a little chloride of sodium	3.67
Sulphate of potash and soda	1.30
	100.00

Nitrogen 13.82 per cent.—equal to ammonia 16.78.

Total quantity of phosphoric acid equal to phosphate of lime, 3.36 per cent.

ANALYSIS III.

By Lewis Thompson, Esq., M.R.C.S., Consulting Chemist.

	Per cent.
Organic matters, containing 12.9 parts of ammonia, equal to 50.1 of sulphate of ammonia	72.50
Inorganic matters, containing 23.2 parts of phosphate of lime and 2.2 of alkaline of salts.	25.40
Moisture	2.10
	106.00

The alkaline salts contained some potash.

ANALYSIS IV.

By J. C. Nesbit, Esq., Consulting Agricultural Chemist.

Analysis of sample of fish manure from Mr. Pettitt, 145, Upper Thames-street.

	Per cent.
Moisture	3.68
Organic matter and salts of ammonia	74.82
Silica	0.30
Phosphate of lime	15.84
Phosphoric acid, soluble, equal to 0.8 phosphate of lime	0.39
Alkaline salts and phosphate of lime.	4.97
	100.00

Nitrogen, 9.31 per cent.—equal to ammonia, 11.29.

Here are three specimens before the meeting. Their intrinsic value, according to the scale before alluded to, is as follows:—

Of No. 1	£9 12 9
Of No. 2	9 2 6
Of No. 3	9 7 7

or a mean of £9 7s. 7d. per ton, derived principally from ammonia, the mean yield of which, in the three specimens, is £7 11s. 4d. per ton.

The manufacture of this guano, on a large scale, will be carried on by a process of the following nature:—A given weight of fishy matter is placed in a large tank, and sulphuric acid of commerce added to the mass. This may be called the digestive process, for the action of the acid is so powerful as speedily to reduce the organic matter to a soft pulpy consistency, resembling in appearance the fecal matter of the birds. This pasty mass being placed in a centrifugal drying machine, and the superabundant moisture forcibly driven off, the partially dry matter is now submitted to a heat not exceeding 212 deg. Fahrenheit, supplied by warm air or steam, and afterwards pulverised in a suitable manner. In this process,

the oily matter of the fish separates itself, and swims upon the surface of the liquid, hence it can be easily separated, and forms an important item in the economy of the manufacture; since, taking all kinds of fishy matter, we obtain an average of 3 per cent. of oil, worth £25 per ton, or, as will appear hereafter, three-fourths of the whole expense of the raw material. Another process might in some cases be adopted with advantage, especially with cartilaginous fish, such as skate and dog-fish, namely, by submitting a given weight at once to the drying process by warm air or steam heat, and then moistening with dilute sulphuric acid, which, in this case, acts simply as an antiseptic. But this process is rather more expensive, and is therefore only useful with cartilaginous matter, on which it is found, by experience, that acid hardly acts. There is another form of fishery manure, and a most interesting one, reference being had to the manufacture in Ireland. It consists of a mixture of fish reduced to pulp by acid, and dried by the admixture of peat charcoal. In this form all the nitrogenous liquids, spun out by the former process, are retained, and there is full half in bulk of a very pure form of carbon. "Powdered charcoal," says Liebig, "surpasses all other substances in the power which it possesses of condensing ammonia. Within its pores it absorbs 90 times its volume of ammoniacal gas which may again be separated by simply moistening it with water. It is not only a slow and constant source of carbonic acid, but it is also a means whereby the necessary nitrogen is conveyed to the plants." Now, carbonic acid may be termed the breath of plants, and they inspire it as animals expire it. By the processes of decomposition and recomposition, the carbon of charcoal arrives at the form of the fat of a prize beast; hence, in like manner as ammoniacal manures are suitable for wheat, the staff of man's life, so are manures like this, rich in carbon and phosphate of lime, the element of bone, the most valuable of stimulants for green crops, the staple food of our beasts. The simplicity of the preparation of this manure should enable it to be sold at a low cost; and the preparation of the charcoal makes another branch of industry which might receive fresh impulse from the carrying out of Mr. Pettitt's scheme. Now, as to the supply of the raw material. Attention was, of course, turned to this at an early stage of the affair. Information was collected at the outposts on the British and Irish coasts, and from persons resident in or well acquainted with our colonies; and much information collected from the voluminous reports of her Majesty's Commissioners of Irish Fisheries, and the report of Mr. J. D. Andrews "On the resources of our North American Colonies," prepared by order of the Congress of the United States, in 1851. It appears from Mr. Andrews' report to the American Congress that the Great Bank Fishery of Newfoundland which formerly employed 400 sail of square-rigged vessels and 25,000 men, is now entirely deserted, owing to the withdrawal of bounties. It is a submarine elevation 600 miles long and 200 broad, covered with cod fish, of which 10 or 12 men can take 50 tons in a short season, yielding four tons of oil. He gives the exports in fish of the British colonies as under:—

From Newfoundland, in 1850,	Cwt. 949,169
„ Cape Breton, in 1848, „	41,364
„ Nova Scotia, in 1851, „	196,434
„ Canada, in 1851, „	224,000
„ New Brunswick, in 1850,	Lbs. 263,500 dols. worth.
„ Labrador, in 1851, „	1,000,000 „

It may be imagined what a vast quantity of valuable manure

might be made from the mere refuse of the curing establishments at work to procure the above vast total of dried cod fish only, seeing that fully one-third of the gross weight is thrown into the sea, as the waste of the manufacture. This was stated by a member of the Council of Newfoundland to be in some places an absolute nuisance to the community of that island, from the formation of banks of refuse matter on the shores. Although the demand for dry salt fish is not very likely to increase more than *pari passu* with the Roman Catholic population of the world, it may well be imagined that, were a new market opened, we might hear of the Great Banks of Newfoundland being again covered with the cloud of shipping which was withdrawn after the year 1814. Another extract from the writings of Professor Way shall conclude this division of the subject. He says, very briefly, "Fish may be taken as the type of animal, wheat of vegetable life; and there can be no doubt of their mutual convertibility when placed in the proper circumstances. I have dwelt upon this point in order to show how very valuable a source of manure, and consequently of food, we have in the waters that surround our shores, if we could work out the problem as one of economy. Practically, we do so this day by bringing guano, which is digested fish, from foreign parts."

In the third place we have to consider the cost of this manufacture, or, to use the expression just quoted, "how to work out the problem as one of economy." Estimates are, as is well known, most treacherous ground, and in those which here follow it must be borne in mind that, from the well-known variation in the prices of fuel and materials, in cost of transit, and in rates of wages, there is no pretence of anything beyond a fair approximation. The cost of fish is arrived at from due consideration of the two methods of obtaining it, which are—1st, Fishing for it in your own boats; or, 2nd, Purchasing it by contract. The first of these plans is open to objection *prima facie*, as having an appearance of centralisation; and it has, moreover, been always found that associated fishery companies have met with ill success. Still, however, whole fishing communities have been found willing to exchange their uncertain gains for regular pay. The second method has been also hailed as a boon in numerous places on the coast, where the ideas of the fishery population have been sought for on the subject. Those unacquainted with the subject will scarcely credit that the fish which appears at Billingsgate at 2d. to 1s. per lb., hardly fetches more on the Yorkshire coast than £1 10s. to £2 10s. per ton, and very often less; and that thousands of tons of coarse, common, waste, and broken fish are annually taken round our shores for manure only, and delivered into farmers' carts at from 8s. to 10s. a ton. We may safely count on a great quantity of fish, either taken by the fleet of an association, or bought by contract, at a cost all round of £1 per ton.

Taking 60 tons weekly, at 20s., the raw fish will thus come to, annually	£3,120
6 per cent. of sulphuric acid, at £7 per ton	672
Labour, of all sorts, 15s. per ton.....	2,340
Fuel, 5s. per ton	780
Sacks for 1,653 tons guano, at 7s. per ton	578
Agency for sale of same, at £1 per ton	1,653
Interest, wear and tear, and minor charges	1,500

Total..... £10,643

SALES—

3 per cent. of oil on 3,120 tons of fish, or		
93 tons sold at £25 per ton.....	£2,325	
1,653 tons of guano, at £7 per ton	11,571	13,896

Profit £3,258

In this estimate advantage has been taken of the profits from the fish oil, to reduce the price of the manure to £7, while its intrinsic value, as previously shown, is £9 7s. 7d. per ton. Were the whole of the charges incidental to the manufacture to be thrown upon the guano, it appears that its production would cost £4 18s. per ton, and that it should realize £7 at least; and this is the answer to the third question. The fourth query, it will be remembered, was whether a sale would be found for the manure when made. It is almost superfluous to enter upon an argument which can after all only arrive at a probability; but the reason why a strong probability exists shall be touched upon, simply to obviate a possible objection that this point has not been considered. It is assumed that there is a very great necessity and ready market for some manure, and that the fisheries guano can be sold at the price before stated. It remains to see whether it has the qualities of a saleable article. There remains for the consideration of this society one point which should by no means be foreign to its objects. These are the possible national and social advantages of the scheme. The depressed condition of much of the fishing population of Ireland, and many parts of Scotland, has been too long and too often before the public to need detail here. Since the withdrawal of the fishery bounties for the last time in 1827, which had in five years doubled the number of men employed, the fisheries of the west have again receded to their old level. The Crown Commissioners have most honourably and sagaciously administered, since the commencement of the present century, more than £250,000 in the relief of the Irish fisheries alone, but with comparatively little result. It was vain that piers were built, harbours deepened, and loans in boats and nets made to the fisherman. For a time he caught the fish, but who was to buy it? The State could not give the Irish population money to buy what they had paid the fishermen to catch. The fisheries have therefore obstinately declined, in face of State encouragement and of chartered companies, which had for their object the providing vast quantities of edible fish for the great markets. But if we demand of the fisherman 10, 20, or 100 tons of marine matter of all sorts and conditions, instead of his customary selection; if, in fact, we nail over the factories the homely old proverb—"All is fish that comes to our net," we surely must and shall drag forth more labour, and fully employ all who at present wretchedly divide their time between sea and land; and, half farmer, half sailor, are comparatively cripples in either vocation. As a nation, we are thankful that the sea-faring life has always been most alluring to the natives of these islands. Those who pursue their business on the waters are fain to continue their calling in spite of grinding poverty in every form. The heart of many an observing traveller has been moved at the sight of the wretched man, the crazy ill-found shallop, and the ruinous hut, that compose, so to say, an Irish or Hebridean fisherman and his stock, and at the reflection that this should be the raw material of the British sailor.

The fisheries have always, with the sea-borne coal trade been esteemed the nurseries of our national navy; and we have now more than a little difficulty in manning our fleets, to

speak in the most reserved manner; and that difficulty will not diminish with an increase in the number of ships of war, unless, indeed, there were at the same time a vast and lamentable reduction in the commercial shipping of the country. This very commercial marine is now inadequate to the work of the traders. More ships and more men are wanted for commerce; more ships and more men are called for, to protect British rights and serve British interests in every quarter of the globe. It cannot surely then be out of place to suggest that a plan which, having borne investigation in a commercial and scientific point of view, shall offer even a symptom of benefit to the nurseries of our sailors, becomes of almost national importance and worthy of public consideration.

Prior to taking any discussion on the subject, Mr. FOSTER, the Secretary, read the following paper by Mr. J. B. Lawes, who was unable to be present, on fish manure:—Some years ago, a gentleman, who possesses a large property in Newfoundland, and who carries on an extensive business in salting cod fish, requested me to make some experiments, with a view to converting the unsaleable fish and cod fish offal into a manure, and also to ascertain whether the dried cod fish would be valuable as a food for animals. An account of some of the trials of the dried fish itself as food for animals, is now in print, and will shortly appear in the "Journal of the Royal Agricultural Society of England." To explain, however, the conclusions arrived at in reference to the use of the offal fish and refuse as manure, the following short statement of the process employed in curing the fish for food may be given:—Platforms project out into the sea, upon which stand the men who cure the fish. The fish are handed up from the boats, and the curers split them down with a knife, take out the back bone and the offal and throw it into the sea; and, having sprinkled some salt over the fish, it is removed and dried in the sun. The quantity of offal thus thrown away amounts to some hundred thousand tons. The question was not whether such matter, when properly prepared, would be a good manure—for of this there could be no doubt—but it was, whether a manure could be prepared which would, in point of composition, supply certain constituents at a cheaper rate than guano and other manures already in the market. Looking at the question in this point of view, the inquiry showed that there were difficulties in the way of attaining such a result, which were sufficient at the time to lead to an abandonment of the idea of converting this refuse into a marketable manure. Thus, the fishing season is confined to a short period during summer, and time and labour are then so valuable, that every man, woman, and child is employed in some process connected with the preparation of the cod as food. Indeed, so important is it that the population should not be occupied with other pursuits, that the cultivation of the land is neglected; and the proprietors of the fisheries supply the people with food and other necessaries imported from other countries. Under these circumstances, it was evident that, in order to convert the offal into manure, one of two things must take place: either part of those already employed in catching or curing fish for food, must leave that occupation for the other, or a large number of people must be brought from elsewhere, and be maintained by the proprietor for the sole purpose of making manure. With regard to the first of these alternatives, it is clear that, so long as a ton of dried fish would sell for much more than a ton of the manure, it could not be to the advantage of the proprietor to change the occupation of the people; for the cost of the fish itself, apart from that of the labour employed in preparing it, would be comparatively small,

whilst that of the latter would be nearly as great to convert a ton of offal into manure as a ton of the cod fish into food. On the other hand, to maintain a larger number of people on the island for the purpose of converting the offal fish and refuse into manure, seemed not likely to be profitable, unless the manure were to sell for a higher price than its composition and the relative value of other manures in the market would justify. Under these circumstances, it appeared to me that unless the offal fish and fish offal could have been kept until the busy season was over, and then worked up for manure, it would not be profitable to engage in the manufacture; and as this even involve some immediate expenditure of labour, and as such matters enter very rapidly into putrefaction, I could not see that the undertaking of converting the Newfoundland offal fish and fish offal into a portable manure for competition with others in the market was practicable. With regard to the more special subject to be brought before the society this evening—viz., Mr. Pettitt's Fisheries Guano—I see that a discussion has taken place on this subject before the Royal Dublin Society; from the report of which I think we may gather that large quantities of offal fish and fish offal, which at present are thrown into the sea, would be brought to shore, provided they could be sold on the spot at a price of from 30s. to £2 per ton. I also gather from the same paper, that Mr. Pettitt's process consists in mixing sulphuric acid with the fish material, and drying it. It certainly appears to me, that a fish manure prepared by such a process, although undoubtedly an excellent manure, is nevertheless widely different from guano, both as to the constituents which it supplies and to the state of combination of those constituents. In guano we find large quantities of phosphate of lime (in a state of combination in which it is more readily available than in most other manures), whilst, judging from the analysis by Professor Way, the product of Mr. Pettitt's process contains only a very small quantity of phosphate of lime. In guano, again, the whole of the nitrogen, or nearly so, exists either in the form of ammonia or of other very readily active nitrogenous compounds, the products of the perfect chemical destruction in their passage through the body of an animal of those more stable nitrogenous compounds of which the bodies of the fish so largely consist. In the product of Mr. Pettitt's process, however, I presume there can be but little of the salts of ammonia or the other compounds resulting from the digestion, assimilation, and retransformation of the substance of the fish when it has been used as food. In fact, the proposed fish manure is dried animal matter, with but little chemical alteration; in which, therefore, a large proportion of the nitrogen will still exist in its original state of combination. However valuable, therefore, such a substance may be as a manure, it can certainly with no propriety be called a guano. The chemical effect of the sulphuric acid on the animal matter, and its utility in the process, are, indeed, not very obvious. It would probably serve, on the one hand, somewhat of an antiseptic; and on the other, to retain the small quantity of ammonia which might still be formed. Again, the example of fish-manure analyzed by Professor Way contained only about 5 per cent. of water. But as the quantity of water in fresh fish is not much less than 80 per cent., it is obvious that it would take from four to five tons of fresh fish to produce one ton of the manure in the condition of dryness as stated. If, therefore, we take the most favourable estimate which the statements at present made seem to justify, namely, that one ton of fish, or its offal, could be delivered on shore for 30s., it would then appear that from £6 to £7 must be paid for the raw

material only, at the place of landing, of one ton of manure: to which must be added the cost of sulphuric acid, of the drying, of labour of boys, transports, &c. For these reasons, I think it will be very difficult to produce a manure of the kind in question which can be sold to the farmer at much less than the present price of Peruvian guano. It would seem, indeed, from calculation, that unless offal fish and fish offal could be obtained at an almost nominal price, it would at present be almost impossible to establish a manufacture which could so compete with the manures now in the market as to hold out a prospect of success both to the producer and the consumer. And how far also a decline in the present supplies of natural guanoes, as well as a much reduced estimate of the cost of the fresh fish and offal might affect the result, is of course a further question.

At the conclusion of the reading of the papers,

Mr. HORACE GREEN said that though the paper of Mr. LAWES was very valuable, it must not be forgotten that that gentleman was himself a large manufacturer of guano. The guano now brought before them did not contain so much of phosphate as of ammoniacal properties, which were best for the staff of man's life—wheat; while the guano of Mr. LAWES was best for turnips and green crops—the food of beasts.

Mr. MECCHI came from rather a fish country—Essex—where it had long been the practice to manure the land with fish, and it was the conviction of the farmers in that district that within a certain distance of the coast—say eight or ten miles—the sale of fish would successfully compete with guano. There could be no doubt that fish manure was good for root crops. The star-fish, or five-fingers, fetched 6d. a bushel, and sprats 8d., excepting in very cold weather, when the latter article rose in price, in consequence of the quantities sent up to the London market. That might, however, be considered the average price, which would give them 1s. 6d. per cwt., or 30s. a ton. Large vessels were employed at Holbury and other places to catch fish for agricultural purposes. Mussels were also extensively used in their shells, their cost being about 20s. per ton. The guano at 30s. per ton would no doubt be valuable; but how far its being dried and cured, so as to obtain the oil, would enable it to be sold at that price, of course he could not give an opinion. If they could fix the ammonia by the use of sulphuric acid, it would of course add to the value of the manure.

Professor JOHN WILSON, during the reading of the first paper, noticed two or three inaccuracies, which he would have corrected but for the paper of Mr. LAWES just read, with which he fully agreed in every particular.

Mr. J. C. NESBIT wished to notice one or two points in the first paper read. In referring to the supply of guano, he might observe there had been an increasing sale each year, though the papers of the House of Commons did not enable them to decide on the exact quantities imported. He believed the reason why there was nearly a deficiency last year arose from the desertion of the sailors from the vessels in Australia which were under engagements to call for the guano on their voyage home. He had always looked upon fish manure as of great importance, and some years ago he tried some experiments, by which he found he could obtain a large quantity of oil and valuable manure from fish. He recommended it to Mr. FISHER HOBBS and other well-known agriculturists, and told them the supply of guano would not last more than a few years, whilst there was plenty of fish round their own shores. Mr. LAWES'

objection to the use of the fish guano appeared to be that it would not digest chemically, and that, when dried, it would not act so well on the ground. Now, there had been large importations of late of a peculiar manure from South America; it was the dried flesh of animals killed at Buenos Ayres, principally for their hides. This flesh manure, though highly dried, was found to act well for wheat, and he had no doubt that dried fish would also act and give forth the ammoniacal and other properties required for the food of plants. He thought that if the fish guano could be obtained at a reasonable price, it would be productive of great results. Of the dried flesh, only about nine per cent. was ammonia; but it had been proved to be very good for wheat. Thousands of tons of it had been used; but the supply had been interrupted, owing to the disturbances in Buenos Ayres.

Mr. DUGALD CAMPBELL said, on looking over the specification of Mr. Pettitt's patent to ascertain its objects, he found that one part of it provided for the decomposition of animals as well as fish—a matter highly important in a commercial and chemical point of view. Some years ago, Mr. Turnbull, of Glasgow, the proprietor of Turnbull's blue, produced in his manufactory a large quantity of muriatic acid, which he did not know what to do with. He accordingly took to buying up dead horses, and boiling them in the acid to a pulp, which was then converted into dry flesh manure, for which it was sold. He had seen specimens of it, and found it contained a large proportion of muriate and sulphate of ammonia.

Mr. MECCHI might observe that Mr. HUDSON, of Castleacre, having a few years since lost a large quantity of sheep, which he had imported, by small-pox, he had them decomposed into manure for turnips, and met with great success.

Mr. JAMES CAIRD did not wish to enter into the merits of the fish manure, but would address himself to the practical part of the question, viz., could a sufficient quantity of fish be obtained at a price to make the manufacture of the guano profitable? Mr. LAWES said that fish contained 80 per cent. of water, and only about 5 per cent. of guano and 15 per cent. of other products. Mr. GREEN, on the contrary, said it only contained 40 per cent. of water. If Mr. LAWES was right, the expenses would be at once doubled.

Mr. PETTITT might observe, in answer to Mr. LAWES' statement, that the fish only gave 20 per cent. of solid product; that he held a specimen in his hand in which there was 16·80 per cent. of bone or phosphate of lime. He believed that on an average he should get 30 tons of oil and manure to the 100, and five tons of phosphate of lime. Supposing, however, that a ton of guano could be produced from four tons of fish, that would give them £9 per ton, at a cost of £4 for the raw material, as all kinds of fish, including turbot, cod, &c., could be obtained on the Yorkshire coast at £1 a ton.

Mr. MECCHI said 100 tons at 30s. would amount to £150, and if it produced 30 tons of guano, that would give £270; and the question was, would that remunerate the manufacturer?

Mr. CAIRD thought that the raw material could not be obtained at £1 per ton; and if there was a larger demand than at present, it would enhance the price.

Mr. BIRD agreed with Mr. CAIRD with regard to the supply. He did not think it would pay, as a commercial operation, to erect large machinery and trust to a doubtful supply from the neighbourhood to keep it at work.

Mr. PETTITT stated that of course he should not erect large

machinery except at places where he expected a large supply. As regarded the question of supply, if the present fisheries were carried on at a profit, solely for the taking of select eatable fish (and it might be safely assumed that there was a profit, or they would be discontinued), how much more successful must this scheme be, combining the profits of the present system with the large profits of the proposed guano manufacture, from animal matter of all kinds, drawn without extra labour from the teeming waters!

Mr. NESBIT understood that four-fifths of the fish caught was returned to the sea as useless, and the question was whether this could not be bought up. It was to the refuse fish, now thrown away, that the great supply must be looked for.

Mr. CAIRD considered the whole of Mr. Pettitt's calculation to be based on the cost of refuse fish.

Mr. GREEN denied that it was so; it was based on the calculation of fishing or contracting for fish of all kinds, and they might perhaps send the best to market themselves.

The CHAIRMAN said, that by the rules of their society, and very properly, no decision was ever come to on the value of the papers laid before them. There could be no doubt that the subject of utilising refuse materials of all kinds, and the more especially of fish, as it would not only produce them good manure, but add to the food of the people, was one of the greatest importance. Large quantities of fish were now thrown away which might be converted into manure, and the practical question was whether it would commercially pay. He then proposed votes of thanks to Mr. Green and Mr. Lawes for their valuable papers, which were carried unanimously.

The meeting then separated.

UNITED EAST LOTHIAN AGRICULTURAL SOCIETY.

The anniversary meeting of this society was held in the Town Hall, Haddington, on Friday, Dec. 30; the Marquis of Tweeddale presiding. He stated that the society had offered a prize medal for the best essay on "The most profitable mode of growing and consuming green crops—particularly turnips and grass on stiff or close-bottomed land, which has been thoroughly drained;" that only three essays had been lodged; and that the committee had withheld the medal on the ground of want of merit in the essays. It was now open, however, for discussion at the present meeting.

Mr. DOUGLAS, Athelstaneford, New Mains, then read the following paper:—

"Gentlemen,—In submitting to you my opinion upon the subject for discussion this evening—viz., 'The most profitable mode of growing and consuming green crops, particularly turnips and grass on stiff or close-bottomed land, which has been thoroughly drained'—I beg to state that I had no intention of doing so until within a very few days, when I understood no very satisfactory essay, elucidating this most important subject, had been sent in to this society. I then considered it to be the duty of every member not to allow such an opportunity to pass without at least expressing his opinion on the subject, however brief or faulty it might be; believing that the principle of free inquiry and private judgment, and its special importance in the successful carrying out of a particular mode, is best consulted and tested at meetings like the present, where many eminent agriculturists are present who may have attained equally successful results from very different practice; and, by each favourite practice being stated, we are more likely to correct one another and arrive at some acknowledged mode, which, by its general adaptation and adoption, might not only be more advantageous to ourselves, but to the country at large. Our motto is, then, 'Prove all modes—practise that which is best.' These two precepts embody two antagonist principles, which, when brought together in juxtaposition, mutually qualify and balance one another; the one being opposed to that dogged temper which clings to institutions and opinion, because they are old; the other, to that restless spirit which is enamoured of every proposal of change, for little or no other reason than because it is new. But, gentlemen, the trial must be earnest—it must be as men bent

on the settlement of an urgent, practical question—that we are to prove all modes; so it must be full, complete, and comprehensive, taking in all the elements of a right determination. And it is with this view of the matter that I am induced to state the practice which will, in my opinion, secure the most profitable growing and consuming of two of the leading green crops, on the particular soil spoken of in the subject for discussion. Heavy and close-bottomed land, that has undergone the primary and necessary process of thorough drainage, and that is intended for a crop of turnips, should have manure prepared for it, and ready to be applied immediately after harvest work is concluded. The field should then be laid off in divisions, feerings—well thrown out (to provide against gathering up the soil higher than the surrounding surface)—of 48 yards apart, drawn transversely on the ridges, and to the square of the straight side of the field. This distance leaves 24 yards to gather up, and 24 to wind out—a space equal to four ridges. Indeed the proper width that all open furrows should be in every field of any size, except in butts (angles of fields), where *half* the width is more economical, any little loss of time by the wider turnings at the end, is much more than compensated by the getting rid of one-half the double feerings, setting poles for the same, and also by saving a furrow in the ground furrows—not to speak of the land being more regularly ploughed, and consequently the crop will be more equal. All land for grain crops should be ploughed the same distance apart: the gathering-up or feering furrow, and the open furrow, should only be drawn before ploughing, to insure accuracy in the furnishings. When the field is sown by drill machine, the ridges may then be measured, and furrows (a mere mark) drawn for reaping purposes; but even this is not necessary when a machine-reaper is to be used. But this is a digression from the subject-matter in hand; I only mention in passing, that I find this system of ploughing best adapted for general cropping, and that for many reasons not noticed here. From 12 to 20 tons of manure per Scotch acre, with an application of from 4 to 6 cwt. of best Peruvian guano, at the time of sowing, is sufficient to produce a full crop. A careful man has no difficulty in applying the dung across the field between the feerings, as accurately as it had been along ridges. By simply using three feering poles, and keeping

the row of heaps within their line, the space will turn out eight ridges. The work should be begun in good weather, when the land is dry, the lower end of the field commenced with first; and the process of laying out, spreading, and ploughing-in should be going on at the same time; or, if the field be at a considerable distance from the farm-buildings, of more than ordinary bad access, or steep position, and the land very dry and favourable for the carting on of the manure, it will be advisable that the *whole* of the available strength of the farm cart it out into heaps; and when the field, or at least the most riskful portion of it, is finished, spreading and ploughing-in ought to go on simultaneously, that evaporation of the essence-strength of the manure may be prevented as much as possible. Having given the field a good furrow—say from 9 to 11 inches deep—well squared out in the bottom, by having the sock of the plough rather broad, and particularly the feather on the outside set low, which is not so generally looked at as it ought to be, and much imperfect ploughing is thereby yearly executed, even supposing the manure is all got out in dry weather, the ploughing process must be discontinued if the land becomes so wet that the furrow in contact with the mould begins to glaze, but again diligently embraced whenever the weather permits. Annual weeds are generally not troublesome, even late in the spring, and couch grass should not abound on such soils. Grass-knots, after they show themselves in the spring, but before they grow much, should be graped up by women or boys; and when the proper time for sowing comes—say from the first till the last week in May—after filling in the open furrows with two bouts or turns of the plough, to properly level the soil—commence at the straight side of the field as the ridges run, and give a double tine of the improved two-horse grubber; then sow the guano, and harrow in with a double tine. Williams's patent Bedford harrow is by far the best for intermixing it with the soil, and reducing such surface; then commence to make the drills by a single furrow of the common tilling plough, in feelings of the same width as before recommended, which require to be correctly measured, so as to finish well at the closings. The drills do not require to be deep drawn—four or five inches being sufficient. The mould will be in average years, generally speaking, pretty fine, so that the seed will germinate and the braird come quickly. A full allowance of seed should, on such land, always be sown; it grows more quickly, and sooner gets into the rough leaf—thus baffling, or, at least partly setting aside, the attacks of the fly. Various plans are recommended for this end; some are to dip the seed in sulphur, &c., to sow mustard in the drill, or between the rows—while the fly is said to feed greedily on—neglecting the turnips. But my opinion is that a full supply of seed, land well prepared, with a liberal supply of guano, hurries the young plants into the rough leaf, and is the best preventive. I may state that I applied soot this year to the plants to a considerable extent per acre, without the least advantage. If the soil is already very dry from drought, and apprehension of it continues, it will be advisable, after the sown drills have dried a little, to roll with a light roller, to secure a braird, if possible, by a little pressure; but this must not follow so close upon the turnip barrow that it leaves the soil on the top of the drills in cracked waves. After a long drought, and the soil extra dry, the roller may even follow the drill machine; but, more generally speaking, it will be necessary to allow a couple of hours before the drills will carry the roller without rending the surface. If, however, the land can be prepared for drilling by a double tine

of the harrows, and dispensing with the grubbing altogether, it is advisable to do so—the less working on this kind of soil the better; always provided that it is loose, and the soil fine enough to braird small seeds. But if the surface, although loose, is mixed with clods, after either the double or single process, it will be necessary to roll with a single horse roller, after the land has been dried a little, before commencing to drill. I have already said that the process begins at the straight side of the field. The preparing, drilling, sowing, &c., should also, like the autumn culture, go on simultaneously, and that under the eye of the master or steward, to see that everything is accurately done and properly carried out. If wet weather comes, the process will be necessarily stopped; but than no risk ensues, as what is not prepared is lying in its rough secure state. This grubbing, harrowing, and drilling process thoroughly breaks up the land, cross cutting at right angles the winter furrow, and thereby effectually stirring the soil to the depth employed; so soon, however, as the process can be recommenced with advantage, not a moment should be lost, and the work prosecuted with zeal and alacrity. The guano should be put through an oat-riddle, and sown upon the surface with a broadcast guano distributor; it will then be laid on regularly, without any being blown away, and correctly as to quantity per acre. This machine is, therefore, a great auxiliary in the use and economy of guano, and can be used with the same effects during wind or rain. When guano is sown by the hand, it should be first emptied out on a stone floor, and a sufficient quantity of water applied by a watering pan to damp it properly, and then be riddled, which will effectually separate any damp balls that may be formed by the water, and in a great measure prevent its being blown away when applying it to the land. I have advised thick sowing, and on that account it will be necessary for the relief and development of the young plants, to thin out as early as possible: thinning by the hand will enable this to be done early enough to relieve them; and, on all soils, I consider this the best way, more especially the kind we are here treating of. Twelve inches apart in the drill, and twenty-seven inches wide between, will generally be found the best distance to grow them. This mode, I venture to affirm, will be found the speediest, safest, and best; and is infinitely in favour of dunging this description of soil on the surface in the autumn—thereby allowing the turnips to be made with a *single* drill, insuring always all the fine soil; whereas, if the land was not manured in autumn, it would require double drilling, *viz.*, drawing to receive the dung, and then covering up again—a process that entails on the surface a great amount of consolidation by the horses' feet, cart-wheels, people spreading, &c., &c.; and consequently brings up a great deal of heel to the surface of the drill, which in the other method does not exist, independent of the liability of being caught by bad weather; the process being slow, and requiring a much greater amount of dry weather before it can be commenced, and a greater interval between recommencing if laid off. But, viewed still further in comparison with old opinions and institutions, *viz.*, the allowing of this kind of soil to be undrained, and the practice of summer fallowing it for wheat; or even premising it thoroughly drained, and set off the mode adopted yet by not a few, of ploughing the ridges *lengthways*, the system generally is, casting them two and two—that is, reversing the former year's ploughing; or even the more absurd plan of feering on the centre of every ridge, and gathering up the soil, then

commencing to work this land crossways in the spring, by it may be, repeated ploughings, and even taking the precaution of preparing small breadths — they compare badly with the mode here recommended, whether we regard the benefits to the land by cross ploughing in autumn, as to the thickening of the soil, by not allowing the furrow water to run on the surface, but forcing percolation of the same, and so introducing air—the more thorough culture and exposure of the soil during winter—economising labour, by saving the ridge furrows—and in the spring doing away with the risk of being caught in the process of steering—the immense saving of labour from the absence of cross-ploughing, and consequent abuse of horses, as well as the retarding, if not neglect, of other following crops, which require to be finished against a certain season: thus, then, does this mode recommend itself to our adoption. It secures success also in the braiding of turnip, from the drills being of finer mould, made up of that portion of the soil exposed, and properly prepared by the action of frosts and other atmospheric influences, to be the most suitable food for small seeds, which by the other process is all lost, being turned topsy-turvy by the crossings. The opinion that the land after a turnip crop is worse to plough, being more firm below, than land that has been subjected to spring ploughings, does not, in my opinion, exist to any noticeable extent, if the land at first has been properly ploughed; and if it did, it would only be an advantage to the wheat crop, any extra roughness sheltering and feeding the wheat plants during the winter and spring months. The variety of the turnip to be sown should also be a consideration on such soils. If it is intended to eat off a part of the crop with sheep, probably a *third* will be the most prudent quantity, as incurring less risk, by being more quickly eaten off. In some cases, however, and especially in dry seasons, when the turnips are at early maturity, the *one-half* may be profitably consumed on the land. The former quantity, as a general rule, ought to be preferred; there should be for early use a quantity of white globe and purple-top yellow; then a proportion of swedes for *spring* use, which last variety should all be pulled off—a practice which will be found the most profitable. The turnips should be sown pretty early, as this description of soil will allow of early sowing, by not running to seed, in comparison with dry field land; and this is the more to be remarked as it allows the turnips to be at full maturity, at an early period of the season, for storing or eating on. It is quite clear, also, that the sheep stock ought to be of a certain description—probably half fat, or at least forward in condition—so that they may be ready for the market in eight or ten weeks at farthest. Perhaps the best way is to let what is to be eat on, by the *acre*, even at a little less than the rate going, provided they are consumed in a given time. When this can be done, it is clearly the better plan, doing away with the disadvantage of buying a condition of sheep that nobody wishes to sell, and, perhaps, being compelled to bring them to a bad market, and, it may be, scarcely ready—the turnips being done. Purple-top yellow and swedes are the best varieties for land of this description; the yellow grows freely and as quickly as white, also feeds and keeps nearly equal to swedes. The mode of having the ground left clear by the middle of November, leaves a fair chance and good opportunity to get the whole land under wheat, which is aimed at in the management throughout. The consuming of the turnips drawn from the ground and stored is more intricate and doubtful than the

consuming of that portion already treated of. It may be stated as a general rule, that feeding the better kind of half-bred cattle in forward condition is the safest practice, as they both grow and feed at the same time; their condition provides against any very serious loss by epidemic disease or otherwise, while their being first-class cattle always commands a good customer. I should be neglecting another means of profitable consuming—seeing that mature is always required in autumn for the turnip break, and that summer feeding on that account is indispensable—were I not to advise a proportion of wintering cattle; and I believe yearling short-horn crosses the best adapted for this purpose, say, to the same number of the feeding cattle: these could be wintered at little expense, and they would be ready to advantageously take the place of the feeding cattle in summer. Ewe and other sheep stock should, on a farm entirely consisting of this description of soil, be dispensed with, except half fat or forward sheep, that I have already recommended. This brings me now to the second division of this subject, viz., the profitable growing and consuming of grass. To have good clover it is necessary that good seed be selected, and properly covered when sown; although I have sometimes seen good crops of clover when it was only sown upon the surface. Much, however, depends upon the weather that follows; and I have found in my practice that it is a safer and better way to cover it properly: it should always be sown on a rolled, or, at least, a smooth surface, and not too deeply covered, as it will not find its way up. Drilled grain crops are allowed by many to be advantageous to the properly establishing of grass-seeds, by allowing a free space for their own occupation and growth. I have had, however, and frequently seen, after broadcast-sown crops, very superior brairds of seed; yet I am inclined to think that drilled crops are the most favourable to the establishing of a good braird; but on this description of soil drilling will only be resorted to occasionally, such as in very dry seasons, or when barley or spring-wheat is sown, the strong soil being in that case prepared by the frosts for the use of the drill. For soiling or cutting for hay, the same varieties and quantities of seed are applicable; and for these purposes 14 lb. red clover, 3 lb. cowgrass, 1 peck Italian, and 1½ pecks of annual ryegrass, will be generally found the best mixture. A few acres in the earliest situation of the field should be top-dressed as early in February as possible, and during fresh, rainy weather, and repeated about the second week in March, when all the field may be top-dressed with advantage, in suitable weather for the purpose. The first application to the few acres should consist of ½ cwt. of nitrate of soda, and 1 cwt. best Peruvian guano, and this to be repeated in March; the remainder getting one application, at the same time, of ½ cwt. nitrate and 2 cwt. of guano. The second crop may be top-dressed with advantage, if the weather be not altogether too dry: it should follow close upon the cuttings, and be sown in the evenings; and should consist of 1½ cwt. of guano per acre, the nitrate being discontinued. The few acres would be ready against the time of the turnips being done, and a regular supply would afterwards ensue from the rest of the field. I may take the liberty of stating here that I have several times sown winter tares for early use, and top-dressed in February, as mentioned; but I always found clover to be my first and best food for stock. It repays the expense of dressing better than any other kind of green crop. Early cutting is never disadvantageous; frequently the reverse. Of course the farmer must calculate his supply and demand for such food, and regulate accordingly: for instance, he would calculate how

much of the first crop would be required for his feeding cattle, horses, and other stock on the farm; this quantity left, he would, at the proper time, convert the remainder into hay, attending to all the necessaries in that department, so that this portion of the grass might also be well managed; for well got and properly made hay is worth a third more than bad got, improperly treated stuff: this fills up the profitable management of the first crop. With regard to the second, the soiling or cutting process will be proceeded with, and when done—if the cattle are not already fat—the turnip crop will be at hand to finish them off; but we shall suppose that, by allowing a little bean-meal and bruised oats, which is the best auxiliary for cattle upon succulent clover, that they will be all fat, or already gone to the butcher. I should not omit mentioning that it is a good precaution to sow early in spring (February) a couple of acres of Scotch tares, to provide against a want of green food between the cuttings; and, if not required, can be as profitably allowed to go to seed. There is also the consuming of clover seeds on stiff land by sheep—folding them on as early as it allows of a full bite, and giving the sheep as much as they can eat each day, eating the food through hurdles with upright bars, wide enough to allow of their doing so; and so on every day until the whole is gone over. But the better way, in my opinion, for consuming clovergrass with sheep, is to divide—say a moderate-sized field—into three divisions, beginning with the first, changing to the second, afterwards to the third; then commencing as before, and going on in this way all the season: it gives the sheep always fresh clean food, and insures the herbage being all equally and closely eaten, effectually providing against the getting away of the ryegrass to tall, dry, uncareful for herbage, and so comparatively lost. The expense and trouble of fencing, not to speak of the advantage of the droppings being thus regularly deposited over all the field—the sheep not being allowed to roam at large, and then deposit at some favourite lair they will have on the extreme west of almost every field—will be far more than compensated by any one of the advantages I have mentioned. But I believe that *soiling* a good clover crop off such land will leave the soil in a better state for the following crop than *any other mode extant*. This, in my humble opinion, is a practice *best* suited for the most profitable growing and consuming of the two principal green crops treated of in this paper, and believe will be found to answer well on a great portion of the same description of land analogously situated. If this system has any one thing to recommend it more than another, it is that it will be found to answer well on any description of land, whether loam or dry field, either for potatoes or turnips: the preparation of such land may differ to this extent, that grubbing be dispensed with. The drills to be drawn off in *feerings*, as recommended by the

best ploughmen, others less skilful covering them again. They should, after being opened, be harrowed down with grass-seed harrows, for the purpose of getting all couch-grass and other noxious weeds gathered off, as well as not too deeply burying the guano: the centre of drill is yet sufficiently distinct for sowing purposes, as well as for covering up. This is a decidedly better method than either steering or grubbing such soils: it more thoroughly and loosely works the land, while the same strength will sow as many turnips in a day, and best saves that moisture of the soil which is allowed to go off by repeated ploughings and consequent exposure, and which I take the liberty to characterise as the essence of the vegetative strength of the soil for that year. But while I believe that this practice is a good one on every description of soil, it can only be adopted to a certain extent on light-land farms, where soiling and consequent dung-preparing in the summer months does not go on to any great extent; neither is it advisable that it should (although much will depend on the climate), so that the bulk of the manure will be prepared from turnips during the winter months, and therefore will only be ready to be applied in the spring, in the drill. But any heavy land, or other field at a distance from the homestead, should be dunged in the autumn with the manure available. It materially furthers labour in the spring, and is a means to enable the farmer to finish the green crop culture in the proper season. I practise this course myself, and believe that, when a farmer has a large corresponding breadth of land for green crop to the quantity of manure he has at command, its application is more direct and sensibly felt when applied in the drill; also that the *improved practice of horse-feeding* should also be observed in *the feeding of the soil*, viz., moderate feeds and more frequent. Each crop, every season, should have its proper feed at the proper time. I do not advise a fruitless dose of a few globules, but an application that will bring about a decided action. Gentlemen, in conclusion, I have only to observe that these opinions are the result of practice which I have found best suited for the possession I occupy, embracing different soils. Notwithstanding this, I shall only be too happy to take advantage of any other mode, which this discussion may elucidate, superior to those I have stated."

A discussion on Mr. Douglas's paper followed, in which the Chairman, Mr. Harvey, and Mr. Robert Scot Skirving took part. Ultimately a wish was expressed that Mr. Douglas's paper should be printed; and the Chairman recommended that the committee give notice that the discussion on the same subject is to be continued at the society's dinner in March, which was agreed to.

The evening was spent in the happiest manner, appropriate speeches having been delivered by the Chairman, Mr. Hope of Luffness, Sir H. F. Davie, and others.

W A G E S.

NO. XXII.—THE MOCKERY OF INVESTITURE: PARENTAL OBLIGATION A FARCE.

Dr. Hook remarks that we live in an age when the question is, *not whether*, but *how* the people are to be educated.

One might as well ask whether the people are to be fed, as whether they are to be educated.

Both acts are alike essential to existence. But a man, you object, may exist without being educated.

Yes, I reply, so may a polypus, or a fungus, and a hundred varieties of brutes and reptiles. But I can-

not call that semi-brutal state in which human nature is now and then lamentably found, *and in which none of the true ends of life are answered*—I cannot call this, I say, *existence*. If I must, I then desire that you will agree with me when I tell you that man consists of 45 lbs. of carbon and nitrogen diffused through 5½ pailfuls of water!

This is chemically true; and yet you know well enough that there are many qualities of mind and

heart, that go towards the construction of man, besides those of bone and muscle.

A being without education is dead; his soul is clean shrivelled up within him; he is a breathing pulsating corpse. To all intents and purposes, such a *thing* is not—it does not exist. I never beheld such a hideous nonentity; and I pray that God's universe may never be deformed by so revolting an object.

Could a human being be shut out from all education, he would be this monstrosity. But he cannot. As long as man has five senses, and keeps up a telegraphic communication with the external world, he cannot. All nature is tongued—and her pure symbolism appeals incessantly to his spiritual self. She is prodigal of her lessons, and adapts them with admirable skill to the awakening, the mature, and the decrepit intellect. I maintain that education is carried on *in spite* of us. There is a home, a mother's smile, a father's persevering industry, a world's activity—all teaching and impressing the child's mind and soul with certain truths; or, there is a squalid home, a mother's inebriety, a father's profanity, and a wicked world—all teaching certain other realities. In whatever sphere the child is placed, he learns something. Non-education is therefore purely out of the question: it is only with *kind and degree*, in the consideration of this question of education, that we have to do.

Since this officious and observing child will learn, is it not possible—nay, is it not probable, arguing from precedent—or certain, since we know the human heart to be prone to evil, that he will, if left to himself, follow rather after the vain and idle teachings than after the good? Had he not better, therefore, be restrained? Should not his mind be pre-occupied by such things as will produce out of the child a vigorous and noble man? Verily a good suggestion. The success of the educationist has proved the truth of it; while the *self-denial* with which his labours are so frequently attended, shew the amount of importance he attaches to his work. He holds no sinecure. Probably he is not enrolled a member of the Societies of Art, or of Antiquaries; he may even lack the commonest of college diplomas; but he has a mission second to none to be fulfilled upon our earth—he is engaged in an enterprise infinitely more noble than that in which our poor Franklin has risked and, I fear, lost his little all—in a glorious work in which he should be honoured, and well supported, for he moulds the imperishable elements of the human mind for Time and for Eternity!

The question of *how* the people are to be educated, or at least the rustic part of them, has, I think, been pretty fully discussed.*

The third question, which Dr. Hook has not mentioned in the sentence I have quoted, follows upon this—namely, *who is to educate the people?*

Strange has been the knocking of heads upon this question. Dr. Hook and Sir James Graham began it. One would have thought there could not have been two ways of answering the query. But our experience demonstrates the folly of attaching certitude to the opinions and motions of men. Are not the words constantly in our mouths, as we behold our neighbours in most unlooked-for positions, or certain events terminating in most unanticipated results—"Wonders will never cease!" "Who would have thought it?"

What man, for instance, in the fifteenth century expected to behold the rooted power of Popedom shivered by the might of one arm?—and yet it was so. Who could have expected that the lofty soul of Bacon would have stooped to employ the blandishments of sycophancy, and worse, to become a very Judas to Justice?—and yet it was so. Who in those stirring and warlike days could have foreseen that the conquest of Mexico, and the possession of its auriferous wealth, would have proved the bitterest curse, instead of the greatest blessing?—yet so it is; for Spain, with all her riches, is degraded and poor indeed. As we grow older, and know more of the world, we become habituated to this species of disappointment.

However, the last ten years have proved that there are more ways of answering this question of "Who is to educate the people?" than one. The first is, "Why, the State;" the second is, "Why, the Church;" and there is a third, last, but not least, "The People."

"But what mean you by the People?" you ask.

The People, statistically considered, are the inhabitants of the realm, the first of the Three Estates imperially regarded: they are the subjects of Queen Victoria, without any distinction of class—I adopt the universal sense.

"You mean to say, then——" I mean to say, in maintaining the rights of the People to educate the People, that I am anxious to defend and hallow the Parental constitution. The original title to education is of the child on the parent: the gentle Desdemona could thus address her father Brabantis, "To you I am bound for life and education!"

"But you must admit," I am perhaps told, "that the children of the poor are placed under serious disadvantages. Indigence imposes a great restriction upon the right and duty of handicraftsmen to educate. Help must be sought."

And help should be given where it is needed, I reply. Its bestowal is the proper indemnity to the poor; for they who owe to them the means of wealth, leisure, and knowledge, ought to pay back to them

* It is my intention, however, to go yet more into detail, when I again approach this subject, with the intention of making plain the way to the assenting will.

not only the wages of labour, but that priceless possession of which labour tends to deprive them.

"And yet you say that the right and the obligation to educate rests with the parent."

Certainly. In case of orphanage, of course, the State steps *in loco parentis*. My children are un-prescriptibly my own—they are myself. Step in between them and myself, and the golden band that unites all society together is snapped asunder. You rob me of my incentive to labour. The fact that the poor have not the time to educate their children—nor the ability, if they had the time—is nothing to our argument. The inability of the parent destroys not his responsibility, nor alienates his right.

"What, then, is to be done? You say so much about the desirableness of education, of the sole duty and right of the parent with regard to it, and yet you own that the poor are utterly unable to discharge the trust."

True, the poor man may have neither the time nor the ability for this grave undertaking; but can he not *depute* his right, and yet be honest—nay, more honest to his responsibility?

"But who is to be deputed in this momentous matter?" Of whom it is to be required! Although I said he is restricted in leisure and ability, I said not the same of his power to provide and recompense a deputy.

"Then you arrive at the *reducio ad absurdum* after all; for how can those provide and recompense a deputy, who, in hundreds of cases, cannot stay the crying of their children with bread?"

It will be as well to look at this "*reducio ad absurdum*" calmly by ourselves for awhile; and when we next meet we may perhaps be the better prepared to analyze it.

No. XXIII.

"And 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."

In my last letter I attempted to show that the right and responsibility to educate are with the parent. We cannot deprive him of the one, nor absolve him of the other, be he ever so poor and inefficient. We must have faith in the great workings of Nature, and deprecate anything that will tamper with parental influence. It may be in numberless instances bad and unwholesome, but we cannot provide a substitute for it. If we would remedy what in the cottages of our poor we know to be fatal to the virtue of the rising generation, without infringing upon the principle laid down, we must cease our warfare against *effects* and *secondary causes*, and strike home, with all the moral power we possess, to the great source of social corruption. I have done my best towards pointing this out.

But to proceed. In justice, we must concede to the labouring poor, not only the full parental investiture, but the right, in common with ourselves, to depute the educating power where they please: they are not to be shut up to this or that.

"Nothing more," said my friend, in my last letter, "need be said upon this ground. You have arrived, after all, at the *reducio ad absurdum*. What is the good of arguing that a man has a right to educate his children, or to choose a deputy to perform his duty, if he cannot pay him too?"

Lamentably significant enough, I admit; but not very absurd, methinks, is this conclusion to which I am driven!

Behold man, invested in the mockery of a birth-right, laid under a Divine obligation which society allows him not to discharge! This is somewhat more than *absurd*; one is absolutely *shocked*. The denial of straw to the Israelitish brickmakers is positively a weak parallel.

Witness an illustration of this mockery in the following note from a Dorsetshire farmer:—

"DEAR SIR,—

* * * * *	
"EARNINGS OF A DAILY LAEOURER FROM OCT. 23RD TO 29TH, 1853.	
	s. d.
Father, as day labourer.....	8 0
Mother, by weeding or milking	1 6
	9 6
EXPENDITURE.	
House rent.....	1 0
6lbs. of bread per diem, at 8½d. per 4lb. loaf.	7 5½
½ lb. candles	0 4
Soap—washing linen.....	0 4
1 oz. tea.....	0 3
	9 4½

leaving 1¾d. for clothes, fuel, shoes, schooling of the children, the father's benefit club subscription, &c.

"The common necessities of meat, cheese, butter, are out of the question. This is the average condition of the labouring poor with us.

"Yours, &c., _____"

I found, during a late excursion into Norfolk, that a county which fairly boasts so much of its agriculture has little to boast on the score of its morality. Here are men, with four and seven and nine children, receiving only eight and nine shillings a week; while flour sells at 3s. 2d. a stone! I only wonder how it is that they manage to be as honest as they are. Upon my speaking to one farmer upon the low wage, he replied—

"I can't tell how the *poor devils* do to get through. They'll be pinched this winter, I know."

"Well, I suppose you mean to advance their wages, and put them in a better position to struggle against the increased price of provisions?"

"Perhaps we shall: I shall raise if the others in our parish do. But there is no chance of that yet, for there are plenty of hands."

"The farmers of a district," I answered, "are usually guided, I know, in the matter of wages, by one or two of the principal of their number; and if these one or two are grinding and oppressive to the poor, you mean to say that you are content to let them make you so also! You know what a man can live upon—offer him not less. You know what is right—do it."

"Oh, very good! Yes, just so," he replied; "but the law of supply and demand——"

"Is," I said, "a despicable outlet for a mean, cowardly spirit!"

And so the conversation ceased.

In many parts of Kent things are pretty much the same; and in Suffolk too. But I need not name more counties: people may apply my strictures where they find them due.

And how can we, if we reduce a man to such a state as this, expect that he shall do his solemn duty? It becomes a farce to select his deputy, since he cannot recompense him. He needs, and must have, the earnings of his children and his wife, and to gain them is brought to sacrifice aught else.

And, so long as we keep wages reduced to the mere subsistence point, and regulate them by that standard, we inflict a vast injury upon the labouring classes: we teach them to be reckless of their moral responsibilities.

It is true enough, that if next week we were to give our labourers sufficient wages for the support of their families, with some shillings to spare, they would very probably spend the surplus upon the luxury of "swipes," or other ephemeral pleasures. And what else can we look for, as the result of the discipline of the last century or two? Have they not been systematically taught to disregard all higher aims? They have not only been accustomed, but taught to look upon education as a thing vastly beyond their reach. They have grown careless, in some sort suspicious of it. Many good people, who have been at considerable pains to provide education for the poor, are surprised and mortified because their efforts are not at once appreciated. "The poor," they complain, "think they confer a privilege upon us when they send their children to our school." And nothing but a series of years of self-denial on our part, and a conduct that shall contradict the general impression that we regard no interest save our own, and make all others subservient to it, will do away with this prejudice. Let us condescend to the man of low estate—to the brother of low degree. Let us urge him, with good motives, to the performance of his forgotten duty. We owe him our help, and let us study to give it so justly as neither to offend his sense of independence nor to weaken that great adornment and attribute of manhood, the *spirit of self-reliance*.

We may go so far as to build schools, and form ourselves into committees of management, guiding the poor by our superior sagacity and knowledge: beyond this, not one step. To offer education to the poor as a gift is a great indignity. Each man amongst them, by act, or deed, or sullen silence, resents it. The parental rancour is transmitted: the child nurses the little revenge, and civil war is to the very hearth!

If in view of the *mutuality* of interest that naturally subsists between the man of money and the man of muscles, the labourer's wages bear a righteous proportion to the *value* of his work, he will discharge his social obligation to educate from his own means, with satisfaction to himself and benefit to the community. To bestow with one hand as charity what is withheld with the other from the just wage, indicates a distressingly low state of moral feeling on the part of the actor. One is tempted to employ the stern rebuke of Paul, "Thy money perish with thee!"

If we do but provide an education such as will ensure the co-operation and support of the parent, it will readily pay its own way. The success with which the Dean of Hereford has met at King's Somborne, where he established a school that may be a model to our rural committees, convinces me that the parents appreciate good education, and will pay high, denying themselves many of the absolute necessities of life for its sake.

Would that we knew more of the instances of utter self-forgetfulness and sublime heroism that abound amongst the poor!

A Prince of Persia was sailing on the water. He dropped a jewel over the boat's side; it sank, and the ruffled waves prevented its being seen. "What is to be done? Bring oil!" Oil was brought, and poured upon the waters, and the jewel, discovered glistening beneath, was speedily recovered. Priceless jewels lie obscured beneath the ruffled waters of poverty: the oil of kindness and human sympathy will discover them, so that benevolence, the strong diver, may secure and replace them in the diadem from which they have fallen.

Be it ours, good readers, to develop the noble qualities we discover—not to crush and starve them out, as though the poor were but "coarser clays, to be rudely shaped into vessels of dishonour; as though they were born to be the tools of gain, the conscripts of ambition, the materials of luxury!"

Which is it better, to behold a man—a man the more, erect and mantled in this new dignity; or to behold him less than a man, a sensual and abject creature, with a ceaseless cry of mingled malice and cunning, "Why save the parish?"

F. R. S.

THE SMITHFIELD CLUB, ITS OBJECT, IMPORTANCE, AND PROGRESS IN 1853.

In the following review it is proposed to notice the object, importance, and progress of our Christmas show during the past year. At first we expected to be able to have condensed the whole into one article, confining our observations to a general review; but after examining the different departments, and weighing the many *et ceteras* involved, including the space required by the other reports, they must assume a special form and be extended over a series of weeks, before we can expect to do justice to some of the more prominent features of the present exhibition. After glancing at the object of the whole, we shall take up the implement department first, following the order of threshing machines, reapers, &c., and the cattle last.

Since 1851 mechanical science in connexion with agriculture has been increasing her speed, and the muster at the Christmas exhibition of the Smithfield Club of this year (1853) shows that she is determined to continue her accelerated progress. The manner in which our great implement manufacturers here strive, within the most inadequate space imaginable, to exhibit to farmers and the public the progress which agriculture is making in this department, is beyond all praise. The inhabitants of this overgrown metropolis have long been acknowledged "a sight-seeing people," and the anxiety which prevails throughout the densely crowded avenues of the Bazaar, to get a glimpse at things in passing, is of the most animating character. The principal parties here are obviously the exhibitors and agriculturists, they being the only people directly interested in the things exhibited; for although all eat butcher-meat, few present will eat of the quality exhibited, and exhibitors and farmers are obviously *more serious*, if we may use the expression, and more loud in their complaints for the want of space to do business than in former years—a fact which speaks for itself. The implement department at the Gloucester meeting covered some ten acres of land; but here parties are squeezed into a very small part of such an area. Several additions have of late years been made, and this year we are promised double the area by 1854. In short, the proprietor affords all the accommodation possible in such a place; but laudable as such efforts may be, and thankfully received by exhibitors, the progress of machinery, and its growing importance to the agricultural world, leaves them a long way behind, so that sooner or later more than quadruple the space here afforded will have to be provided. In other words, the parties who here throng almost to suffocation the Bazaar in Baker-street, require a crystal palace in which to accommodate themselves at our Christmas exhibitions of fat stock, poultry, seeds, roots, and implements; for the scene before us is altogether irreconcilable with our present state of civili-

zation and the progress of mechanical science. Let any reflecting mind stand still but for a moment, and this conclusion must be arrived at.

The want of space prevents that reciprocation of interest which the agricultural world here expect to realize; hence the complaints which are yearly heard, that "the implement show of the Smithfield Club neither serves the one party nor the other." Implement makers and farmers are as utilitarian in their way as any other portion of society, and do not come hundreds of miles from the provinces merely to exhibit themselves and the products of their industry to the metropolis. They have got a nobler work to perform, viz., to reduce the amount of manual labour and drudgery in the cultivation of the soil, increasing its fertility at the same time by improved and more effective mechanical means, in short, to improve the quality and increase the quantity of the daily necessaries of life, and hence to advance the prosperity and happiness, not merely of themselves, but the whole British people. Now the facilities which are here afforded them to perform such a national work are altogether unbecoming the British capital, besides being at variance with the object of the Smithfield Club.

The object of the show below stairs is to improve the quality and increase the quantity of butcher-meat, or, in the commercial language of the club, "to supply markets with the cheapest and best meat;" and the object of the show above stairs is similar in character, but much more comprehensive, being, as was stated in the last paragraph, the improvement of agricultural implements and machinery, with roots, seeds, and artificial manures, and to bring those improvements to bear upon the cultivation of the soil, for the increase of its produce *both animal and vegetable*. Exhibitors, on the one hand, have not only to manufacture and exhibit their things, but also to sell them, and learn from each other's improvements further progress for the next Show; while farmers, on the other hand, have not only to examine, but also either to purchase or give implement makers orders to manufacture articles with any improvements which those exhibited may have suggested, benefiting in all cases by each other's opinions as to the best selection of articles, improvements, and modes of application. In point of fact, the selling, buying, and applying form the most important part of the whole; for unless such take place the grand object of the show falls short of being realized. All the articles here exhibited, for instance, are worse than useless lumber on the hands of their owners, unless brought to bear upon the soil. It was for this purpose that implements and manures were manufactured, and seeds and roots grown; and there-

fore, unless such a purpose is fulfilled, the object of parties is frustrated, and their industry and capital thrown away. Our Christmas Shows somewhat differ in this respect from those of the Royal Agricultural Society in summer; for the object of the latter is to select the best articles, awarding prizes for them, and commending others, for the purpose of enabling parties to carry out the object of the former afterwards. During the week of the summer show farmers have not time to examine and make up their minds, as it were, which is best. They cannot arrive at satisfactory conclusions as to what would best suit their own individual circumstances, so as to enable them to make purchases freely in so short a time. They have generally more than enough to do to examine the prize stock and implements, so as to appreciate the soundness of the judges' awards, and not unfrequently awards are postponed to a future period, and improvements suggested when they are pronounced, as in the case of the reaping-machines at Gloucester. Hasty bargains are by no means advisable; and we think farmers are to be excused for awaiting the verdict of public opinion, awarded through the instrumentality of the press and public and private meetings afterwards. But by Christmas they have time to make up their minds; while implement makers have also had an opportunity of reducing to practice any suggestions they may have received or gained from the summer meeting; so that there is no excuse if business is not done here, and all the improvements of the previous twelve months brought immediately to bear upon the productive resources of the country. Regrets have been expressed that prizes are not awarded at our Christmas shows of implements; but we rather demur from the opinion, on the grounds that such would interfere with their business character of selling and buying. Once prizes to compete for by sellers in twelve months is often enough; and at our summer meeting is obviously the time to award them. If a large sum of money could be raised and distributed at this period among those who made the largest purchases of machinery which have gained prizes or been commended at our summer shows, it might induce some to purchase who now are working with antiquated things, and hence such a project might be entertained as in accordance with the object of the club; as to give prizes for the purchase of improved implements, machinery, seeds, and manure, and their employment in the cultivation and fertility of the soil, procuring from it *the cheapest and best produce*, appears to be the counterpart of prizes for fattening the "cheapest and best meat;" the latter being the produce or result, and the former the means for obtaining or effecting it—the one coming in the shape of a reward for work performed, and the other as a stimulus to enter upon a special undertaking. In practice, the greatest difficulty experienced is to get many farmers to enter upon this enterprise. Once this effected, improved implements, &c., never fail of returning a much greater reward than can be received at the hands of

the Smithfield Club; and this is doubtless the best mode of distributing prizes in the case under consideration.

In the provinces there is still a vast amount of antiquated things in operation; and it were difficult to estimate the increase of produce which the improvements in question might effect, for millions annually are a long way within the mark, so that the object of our Christmas shows is of the highest importance, and the good which they may effect immeasurably great.

To lose sight of the object of the show, under the changes which the progress of science with improved practice is demanding of it, and how that object is accomplished, is to lose our compass and the course in which we ought to move. The growing business of those interested is so curtailed, for the want of space, as to give to their transactions a peculiar character. Exhibitors, for instance, are obliged to employ models, plans, &c.—a course adapted to any one but a practical farmer; to obviate which, in some cases, large things are shown outside, in yards and lanes of the neighbourhood. Or, to give a more practical view of things, the floor of the Bazaar is sub-divided by chalk lines into small rectangles, four feet eight inches by five feet six inches each, this year, with a narrow passage along one side. Each rectangle constitutes a stand, and, as one is too small to hold the majority of articles—such as a plough, harrows, carts, &c., &c.—exhibitors endeavour to get as many as they can; and there is no lack of industry and ingenuity to turn these to the best advantage—hanging up what will hang, and placing one thing above another, so far as practical or allowed by the regulations of the Bazaar. The fact, however, cannot be concealed, that parties are beginning to express more freely their disapproval of being annually thus chalked into rectangles, growing less and less to meet an increasing business and demand without—a circumstance which has induced us to dwell upon this branch of our subject longer than we otherwise would have done. As already stated, agricultural mechanics have made considerable progress of late, much of which has been in heavier materials than are admissible here; so that manufacturers, on the one hand, are not only unable to exhibit a fair sample of their stocks, but, what is much more aggravating, they are also excluded from showing those very things which the present state of agriculture most demands. And, what adds to the discouragement, is the fact that still heavier machinery is demanded, with the prospects of such being soon supplied. We allude to the steam-plough, which, in point of fact, may be said already to exist, several of them having been exhibited in the Crystal Palace in 1851, while patents for several more have been taken out since. No doubt success has not yet been declared in their favour; but just so much the more reason is there for their being exhibited here, in order that their merits may be examined and their short-comings pointed out. We have seen that this is one of the grand objects of the exhibition. The moment we cross its threshold, for instance, we

have to find fault with the whole, because it does not include those very steam-ploughs to which reference is here made; and, since neither their patentees nor manufacturers have an opportunity of exhibiting, it is manifest no blame can be attached to them. On the other hand, farmers when they come here seldom find what they want, as will subsequently be specially noticed; while a thousand prognostications sit looming in the distance, easily prevailing upon them to retain their money in their pockets until they see what the future may really give birth to—whether a perfect steam-plough, reaping-machine, &c., or not. Now the Capital is the very place where such machinery should be shown; for here ingenuity of the highest order to concoct what is wanting, and capital in the greatest abundance to carry out any extensive proposition of merit, exist, while parties are at the ear of the Patent Office to secure the fruits of their ingenuity. Until comparative success has been declared in favour of any new machine, it is almost useless sending it to the summer shows of the Royal Agricultural Society, unless for the purpose of merely being seen, owing to the magnitude of the exhibition and the difficulty parties have of getting over the whole of the live stock and implements which have obtained prizes. The prize stock, implements, and machinery engross their attention every day the show-yard is open, leaving no time to notice the unsuccessful save with a passing glance; and, besides this, the metropolis is obviously preferable to our provincial towns for testing the merits of new things, especially when of any magnitude, and for improving and bringing them before the country generally with success.

The ordeal of the metropolitan press alone is worth that of a thousand provincial towns. Such, therefore, being the facts of the case, why is it that our provincial shows are annually increasing in magnitude and importance, while those of the capital are comparatively standing still? The obvious answer is because our provincial towns respond to the interest of farmers and implement-makers, while London does not; but, independent of this unfortunate and uninviting state of things, both have this year come forward, fulfilling to the best, which circumstances admit of, the object of the show; and it is to be hoped that by another anniversary, agricultural mechanics and their result, the improvement of the quantity and quality of butcher-meat, will be placed in a more dignified position by the "mistress of the world." Our Christmas exhibition is deserving of her patronage; for, as was stated in the leading columns of the *Express* the other week, her inhabitants "would be the first to regret its abolition"—a result which is inevitable, unless superior accommodation is soon afforded.

Curiosity may be satisfied with models, plans, and things got up with a polish never designed for use; but practical men who come to the Bazaar to make purchases, like to see the identical things for which they are to give their money. However qualified they may be to judge of the former and give in-

structions as to what they want relative to weight of materials, it is never so satisfactory as when the thing itself is present, and when they either take it home with them, or order one like it, if sold. In this case there is never any mistake, while with plans, models, &c., there are many, giving rise to disappointments which check the progress of the general adoption of the things sold, thus entailing upon the country very serious losses; but, unfortunately, the parties who are thus qualified to judge from models, &c., are not the parties with whom there is any difficulty in the way of the adoption of the improvements, for those who most want improved implements and machinery have a rooted prejudice against the mode of exhibition in question, not very easily got over. They are condemned generally as the opponents of progress; but without conceding to the one-half of what is laid to their charge, their complaints at issue are well founded, and, therefore, their case is deserving of the most serious consideration.

At the Smithfield Club Shows of 1851 and 1852, the idea of a crystal palace, as already suggested oftener than once, occurred to us as a safe and even lucrative investment for capital, and this year it returns with tenfold importance. Were sufficient accommodation afforded, the show would become more attractive, procuring the patronage of a proportionate increase of exhibitors and visitors, while horticultural and other exhibitions would in all probability solicit the benefits which such would afford, besides large public meetings. The British capital wants something of this kind very much. We shall return to this topic after having discussed the others, which will better show its importance to the agricultural interest.

Year after year, in answer to the complaints for the want of space in the implement department, it has been said that the grand object of the Smithfield Club lies below-stairs—that "there is plenty of room there," and that "ten acres would not please parties above;" but the objection is out of date, for science is pointing to exhibitions of butcher-meat, in preference to live stock, and to progress up-stairs for "the cheapest and best meat." We readily grant that there is more space below-stairs for future prospects; but when we come to discuss the progress made in that department during the last year, we shall find room for amendment.

THRASHING MACHINES.

The appearance of the American separator below-stairs almost makes one hesitate before passing an introductory notice of the progress made in this branch of machinery during the past year; we cannot admit on the one hand that it is perfect in all points and adapted to every peculiarity in the practice of this country, such as large stones, sticks, and even forks being thrown into it by careless servants, which may not be experienced in America, where farmers generally feed it themselves; yet, on the other hand, it would be allowing prejudice to assume the judgment-seat were we to condemn it *in toto*. The fact that it separates the corn from the straw more perfectly, bruising

and cutting it less, promulgates very openly the startling question that we ourselves have hitherto been building upon a sandy foundation, while our transatlantic cousins have found the solid rock. We are far from willing to relinquish machines from which we have so long derived immeasurable benefits, without giving battle to every point which is not invulnerable in the ranks of our opponents; but since they have come so far for the purpose of conferring upon our country very important benefits, at a time when she stands so much in need, the least we owe them is fair ground to fight upon, and this is what we are certain they may expect at our hands.

The vast majority of our machines break and bruise the corn more or less in thrashing, before they are capable of separating it from the straw. Before they make clean work they must be set so close as to damage the grain, rendering much of it, in the case of barley, unfit for malting; in the case of wheat, unfit for flour; and, in all cases, unfit for seed, and more liable to destruction from insects and the weather in shipping and in granary. Oats require bruising before being put into the manger, it is true; but when bruised or shelled in the thrashing, they gather dirt of all sorts, and become mouldy and unfit for use. The experience of the last half-century bears ample evidence to the truth of our proposition, rendering further proof unnecessary. Up to this day we have never been able to obviate the evils at issue, for we either leave the corn in the straw or else bruise and break it.

Why do our machines break the corn more than the American? The obvious answer to this is, because the *modus operandi* in separating it from the straw is different—the former being by a rubbing or grinding operation, under a greater motive power; and the latter a combing or rippling operation, under a less amount of action. If you take a handful of unthrashed corn out of the sheaf and rub the ears in the hand, you exemplify the principle on which our machines thrash. To make clean work you must compress the ears in rubbing, otherwise you will leave many kernels in the straw; for if you hold it loose, you only brush the hand, thrashing none. In thrashing with the flail for instance, the thrasher frequently takes any band which has escaped his flail, and thrashes it across his "handstaff," or the handle of his flail, which exemplifies the American principle. The practice of "lashing," pursued in some parts of Ireland, is a still more extensive example of the latter mode; the difference being that in the one case velocity is given to teeth in the circumference of a cylinder, the sides of which ripple out the corn, and in the other an Irishman takes about the third part of a small sheaf by the root-end in both hands, and with a sharp, drawing stroke, over an old barrel, thrashes out the best of the corn for seed. We have seen large quantities of seed procured in this manner, free from any damage or inferior grain, during the short time we were in the sister country. But we must enter a little more into mechanical details, in order to illus-

trate differences properly, and for this purpose shall investigate the shortcomings of the two machines separately.

The sheaves, when spread, in feeding the English machine, pass sometimes between rollers (as our readers are aware), and sometimes without rollers, under or above the cylinder or drum, through a narrow space of about half an inch in depth, the concave surface opposed to the drum being fluted or an open screen, so that, if the length of the drum is thirty inches, the whole space will be fifteen square inches, or, if forty inches, twenty inches, equivalent to a ring about four inches in diameter! The action to which the sheaves are subjected in passing through this narrow space is more of a rubbing and squeezing character than scutching. The first stroke may, no doubt, be partly on the principle of scutching, in the absence of rollers on the one side; but afterwards, the corn is squeezed through, and that in a very rough manner, approaching to something like pounding in a mortar. The facts that the drum does not make clean work, when set wide or at a great distance from the opposite concave surface, and that it thrashes cleaner when this surface is fluted, prove in the plainest manner the rough treatment which the corn receives in passing through so small a space between two metallic surfaces, the one thrashing nearly as much as the other. We are not here saying that the action is wholly rubbing: what we wish to draw the attention of our readers to is the battering, crushing, and grinding which the corn receives in passing through the small space of fifteen inches, breaking so much of it, and rendering it unfit for malting and seed. The loss annually sustained from this source is far greater than the interest of capital invested in thrashing machines.

In the separation of the straw from the corn, again, after they have passed from the drum—technically termed "shaking"—few English machines perform their work well; while the vast majority are more the friends of pigs and poultry than the farmer. In this part of the machine we have certainly been making very important progress of late, working round the American "shaker," though, hitherto, never into it; but, as yet few of these are adopted, and farmers are to be heard, in many provinces, complaining about bad shaking, large quantities of corn being still carried out with the straw to the dungbill. Two large spiked cylinders kicking and flinging behind the drum, rolling the straw occasionally around themselves when it is the least damp, exemplify a very rude, expensive, and ineffective method of shaking, the moment we see simpler, cheaper, and improved contrivances. To hold up such things, whose working we daily complain of as models of mechanism which we ought to continue to follow, would be absurd; and, therefore, we need not enter into details.

Our corn-dressers or winnowing machines attached to thrashing machines are also very defective, generally speaking; for the corn has first to be riddled by

manual labour from the "mill fan," and afterwards put through a second winnowing machine before being fit for market, the dressing thus costing nearly as much as the thrashing. Much of this depends upon the irregular manner the corn falls into the mill-fan, from the hopper under the drum and shakers, and not a little upon the feeding of the drum. If the sheaves are irregularly fed, being almost thrown in whole, with intervals between every two, the corn will then fall into the hopper or riddle, and the straw upon the shaker, in a corresponding manner, producing much of that bad work experienced, both in the corn and straw-barns; but it does not account for the whole, for not a little depends upon the imperfect mechanism of the winnowing machine itself; as, however regularly the grain may be fed before the chaff is removed, corn is carried over the "tail-board" along with it, while many cut straws and unthrashed ears fall along with the good corn. To keep the chaff-house free of corn, and the corn-barn free of chaff and "riddlings" or "cavings," is one of those undertakings which have tried the patience of many farmers. We speak here from thirty years' experience of thrashing machines, and have no doubt that many will be found to join us in weighing well the shortcomings of our own machines before condemning others, especially should these solve the problem at issue. It matters not how much ingenuity may be displayed in the manufacture of a thing, or how simple may be its mechanism; for in either case, if it does not perform the object sought, it would be folly to place it in opposition to others which do so, whatever may be their construction. It is expenses and the work performed, therefore, that settle the value of the winnowing machine.

The expenses of thrashing machines have long been complained of by farmers, although, from our own experience, and, we may safely say, experience in general, the dearest always prove themselves to be the best bargains, and cheapest in the long run; and therefore, before we can advocate cheaper ones, we must have a difference in the construction and amount of materials used. But this does not in the slightest degree affect the validity of the complaint of the farmer; for, nevertheless, our thrashing machines are heavy, ineffective, and expensive, swallowing up extra capital at the commencement, and afterwards increasing annual expenditures by tear and wear on horses—or by extra coals, if steam—and reducing incomes by wasting produce—calamities enough to make any man complain.

Such are the shortcomings of our thrashing machines, to obviate which has been and is the grand object of all our shows, competitions, and prizes. Our readers will doubtless observe that, in discussing this part of our subject, we have adopted the wise maxim of pulling the beam out of our own eye, before attempting to take the mote out of a brother's.

The American thrashing machine was manufactured in America for the peculiar demands of her agriculture; and the first question we have to consider is this—Is such a machine adapted for the agricultural demands

of this country? And the brief answer to this question is, *certainly not!* We therefore condemn the American machine in its present form on the very threshold of the inquiry, regretting exceedingly that our transatlantic cousins should not have answered such a question before leaving home.

The climate, agriculture, and rural economy of England and America differ in many respects, affecting the thrashing and dressing of corn more, perhaps, than any other operation involved; consequently, machines must be modified to suit the peculiar circumstances of each. We would therefore advise those who have gone to so much expense in importing their "grain separator," not to allow it to enter into competition with its opponents in the yard of the Bazaar until so modified; for this would neither be doing justice to themselves, nor the English farmer. Even after they have made those modifications which the many peculiarities of this country demand, they will find it no easy matter to enter into competition with our improved machines of the last two or three years; but of this afterwards, when we come to discuss their merits, and the further improvements to which they are susceptible.

We have thus condemned a large proportion of the thrashing machines now in use in this country, and the American one in its present form. In our next we shall examine the principles on which the latter is constructed, and how those may be arranged to suit our wants, refuting the objections of its opponents, and hailing its introduction as an important link in the chain of progress. Mr. Moffitt, however, must not dream from this that we are to toss to the winds the other machines in the yard, with others equally, if not more important, which we have to notice. The value of his patent lies in the improvement of old machines now in operation. We can, for instance, introduce his shaker and riddle into thousands of them for a few pounds, if he is not over greedy in granting a licence to do so, in a very short time. British farmers now think, judge, and act for themselves, especially those who have fixed thrashing machines; and it is here where our transatlantic cousins have a field before them, if they make the proper use of it.

Because the American thrashing machine is superseding all others in that country, it is no reason that it should do so in England, and because it does not come up to our peculiar wants so well as some of our own machines is no reason that we should disregard the peculiar principles on which it is constructed, and their merits. If any of its parts, for instance, can be adopted in our machines so as to improve them, or if its different parts can be modified or arranged in any manner so as to make an improved whole, it is obviously our duty and interest to make such alterations and enjoy the benefits which such improved machines would confer.

In America little or no value is placed upon the straw, chaff, and "cavings;" consequently these are all tossed together from the machine in the easiest manner possible. If the thrashing, for instance, take place

in the field in harvest, the cart-loads are brought up along one side, the farmer's son or some other boy in the cart cutting the bands as he catches them, and throws the sheaves to his father or master, who stands upon a platform at one end of the machine and feeds it, while the straw and chaff are discharged at the other end, and the clean corn at the opposite side from the cart. The farmer stands with his back to the wind, so that chaff-dust and everything else are blown away from him; thus not only keeping himself clean, but placing his fan and shaker in the best position for working. If the sheaves have been stacked in the yard, and the thrashing takes place there, the head of the machine is drawn up to the stack, the feeder standing with his back to the wind, so as to allow it to blow everything away from the workmen, as before; and if the sheaves are in the barn, the tail of the machine is turned out at this or that door, according as to which way the wind blows. Again, the climate is dry the crops short, early, and reaped high, which give another peculiarity to this branch of American agriculture. Such is therefore perfectly sufficient to account for the present construction of the machine.

In England everything is valuable, and therefore it is desirable to keep corn, straw, chaff, and cavings separate from each other; because they possess different values. We want the straw delivered in one direction, the chaff in another, the cavings in a third, and the clean corn put into sacks upon the weighing-machine ready for market. Our climate is moist, our crops long and cut as low as possible, the reaping-machine being followed by the horse-rake, which gathers together, along with the loose corn, stones and many other things injurious to thrashing, and all this is done by hired servants; consequently we not only require the different parts of the machine differently arranged, but stronger to meet the hardships to which they are subject. For a few years they might do a little lighter than they are; but those who have any experience of light-constructed machines know that after they begin to get old, they are soon shaken to pieces in thrashing long straw in late and damp seasons.

Now the different parts of the American machine can be easily arranged, and made of any strength to meet the above demands, so that the propriety of the alteration depends upon its merits. The different parts deserving of notice are the drum, shaker, riddle, and apparatus for carrying.

The drum is a wrought-iron, open, and spiked cylinder, sixteen inches in diameter, exclusive of the teeth. The length of the drum is two feet six inches. It works on a spiked screen, there being two rows of teeth of the same length as those of the drum, seventeen in number, projecting upwards. The teeth of the drum are fixed on the beater bars by screws, seventeen also in each bar. The teeth are two-and-a-quarter inches in length in both cases, and one-and-three-quarter inches distant from each other. The drum-teeth do not follow each other in passing between those of the screen, being placed in the bars in different vertical planes, four planes between every two of the

latter, thus stripping at every half-inch. The bars are distant three inches from the screen. The velocity of the drum is about 1,200 revolutions per minute, at which rate it will thrash from seventy to eighty quarters of wheat per day. In feeding, the corn passes under it without the intervention of rollers, such not being used.

The spiked drum is of American origin, and was first introduced into this country by Mr. Atkinson, many years ago, when it failed. It is rather singular that it should have failed and fallen into disuse in both countries at first, and eventually have re-appeared with success in its native land, and finally been introduced by our transatlantic cousins themselves, with flying colours, at Tiptree Hall; thus following, as it were, the fortunes of the reaping machine—a circumstance so singular in its history as to call for closer inquiry into its construction and *modus operandi*.

With the original drum we are not so practically acquainted, but there cannot be a doubt but some important improvement has taken place, however slight may be the difference as to mechanical construction. Machinists are familiar with the fact, that a single stroke of a hammer will sometimes make a machine go when otherwise it would not—some hair-breadth of rigid surface at one point destroying the harmony of parts, and rendering the whole worse than useless. Now, however trivial such an alteration may be, it is more valuable to us than the original invention, and hence possesses more merit, and ought therefore to be accepted accordingly.

In thrashing with the spiked drum there is less of the rubbing and grinding process formerly complained of, and more of the scutching action than with the plain. The corn is not only less compressed, but subjected to a greater scutching surface. At one half-inch between bar and screen in the latter, there is a sectional area of only fifteen square inches, through which the sheaves are compressed in being threshed; while, in the former, there are ninety inches *minus* the space occupied by two rows of teeth, or upwards of seventy inches. Again, the plain drum has only thirty inches of scutching surface in every bar, while the spiked has upwards of 160, counting only one of the rows of teeth in the screen; and when we count both, and add the whole teeth in the drum, and take into consideration that it also scutches with the bars, the difference will be still more considerable in favour of the latter—the two moving at equal velocities. Such being the difference in the mode of action, it is easily accounting for the difference of results as to broken corn, which, according to the general testimony of practical men who have seen it working, is greatly in favour of the spiked drum.

The spiked bar cuts the straw more than the plain; but so far as the general purposes of agriculture are concerned, what we have seen is not injured; all straw used for food or litter is now cut into chaff, or should be so; and as for thatch, we never considered long laid wheat-straw the best for defending rain, or resisting the action of wind. In short, the straw which we saw is better adapted for thatching the stack-yard,

according to the English fashion, than if it had been less broken; and as for thatching houses and trussing for the metropolis, slates or tiles should be used in the former case, and the notions of cockney grooms trained to pay a little more deference to the progress of science in the latter. Were the straw used for litter in the metropolis cut into half-inch chaff, and mixed with ground peat or peat-charcoal, the pestilential gases which now pollute the atmosphere would be absorbed, increasing the value of the manure so as to make it worth inland carriage, whereas at present it is hardly worth the carting to the market gardens of the suburbs. Nothing can be more absurd than to encourage the manufacturing of machinery the object of which is to sacrifice the general interest of the country for no other reasons than chime in with the antiquated notions of cockney grooms.

Stones will break the teeth of the spiked drum. The objection is good, but the harm is easily repaired, while a different construction of teeth may be made sufficiently strong to break bones for manure and stones for road-metal, if parties wish it; or other contrivances may be adopted without an increase of the strength—such as safety springs, &c., &c. In short, whether it be admitted or not, that two years' practice in the United States and the experiments at Tiptree are sufficient to test the merits of Moffitt and Knight's spiked drum as to the breaking of the corn, objections of the above kind ought not to stand in the way of its getting a further trial, if such is necessary; and if the result be favourable, many means may and ought to be adopted to obviate the above objections. If the spiked drum breaks less corn, as the experiments so far as gone prove, every means possible ought to be tried to retain it; for this is one of the most important points in connexion with thrashing.

The American shaker, or "straw carrier," consists of an endless web riddle, made of cross wooden rods, only united at the two sides in chains, which are driven by cog-wheels; thus capable of carrying the straw to any distance which circumstances may require. The chains have small toothed projections upon the interior side, and are made to move over plain pulleys or rollers, which communicate to the rods a tremulous and vibratory motion as these projections pass over them, which shakes the straw; and, as a further auxiliary to the shaking process, the small wheels over which the chains move are not in a straight line corresponding with the cog-wheels, but elevated on the upper or carrying side towards the discharging end—a plan which is found more effectually to separate the corn from the straw than when straight. In the interior of the "straw carrier" a cleaning strap or belt works across it, to remove any straws which may fall through between the rods, thus keeping them clean.

The advantages of the "straw carrier" are, that it makes clean work, is free from "winding" or "wrapping" when the straw is damp, and elevates the straw to any height which the construction of the barn or other circumstances may demand. This latter recommendation is of much more importance in the case of

fixed machinery than some at first sight may imagine who have only experience in travelling machines. It will, for instance, pitch the straw into a cart when required to be carted out for littering the folds, or for stacking for subsequent use, and enable one man to control the straw in the straw-barn, when otherwise it would require two, one to pitch and the other in the mow. And lastly, it appears to be invented purposely as it were to supersede thousands of old revolving shakers constructed some twenty years ago, principally located in our northern provinces, where there would be more difficulty in getting others introduced, because of their being unable to elevate the straw above the level of the bottom of the drum, generally some eight or ten inches below the floor of the sheaf-barn, and where the houses are low, and the sheaves carted into the last-mentioned place, close up to the feeding bench. These are advantages of no ordinary importance, and, we aver, will soon be appreciated by our northern readers.

The riddle is an article of the simplest kind, composed of thin slats, about an inch in breadth, three-sixteenths of an inch in thickness, and in length the breadth of the riddle. The slats are not fixed in a frame, but in four thin pieces of hoop-iron of the same breadth, into which they are notched. Both are placed with their edges uppermost, the hoops perpendicularly, but the cross wooden slats obliquely, with the openings directed to the blast of the fans. This slanting of the slats serves a twofold purpose; viz., it prevents chaff and short straws dropping down between them, as they otherwise would do if placed perpendicularly, while the corn, in sliding down the short inclination of each slat, acquires a more favourable position and direction for the action of the wind. There are different riddles for the several kinds of corn, differing only in the distance between the slats. The riddle, upon the whole, is a simple and most effective article, and universally admired, the more so the longer it is examined, both as to utility, durability, and cheapness. Its simplicity, at first sight, approaches rudeness; but first impressions soon disappear when such becomes its greatest commendation to farmers.

In the corn-dressing department of the machine, screw conveyers—for carrying the corn to the fans, and for bringing back unthrashed ears, &c., to the drum—form the principal objects of novelty. The corn which falls from the screen below the drum, and from the "straw carrier," falls into two concave or circular-bottomed troughs, in which two screws work, conveying it forward to the "eye of the fan," when it falls upon the riddle in the usual manner, only much more regularly than when it falls through a hopper or directly from the drum and shaker. When the corn is bound into sheaves, for instance, the ears are first thrashed, then the straw; consequently, as the principal amount of grain is in the "top" ears, it falls in alternate showers, as it were, upon the screws, which always discharge a medium quantity. A single tail trough, similarly constructed, with a screw working in it, runs across the winnowing machine, immediately behind

the riddle, catching the tails, &c., and conveying them to another screw on the outside, which takes them back to the drum to be re-thrashed. The corn from the "spout" of the winnowing machine falls into a revolving cylindrical screen, which removes small seeds, &c. This screen is of the usual kind, but works outside instead of inside, as some we have to notice. The corn, as it comes from this machine, is fit for market.

The drum, straw carrier, and indeed the whole machine, is within one straight framing, with the exception of the screw outside for bringing back unthrashed ears, &c., to the drum, and the last-mentioned revolving screen for seeds. The machine, exclusive of the carriage, weighs about 14 cwt.; is 6 feet high, 16 feet long, and greatest width 5 feet. When mounted on wheels for travelling, as seen in the yard, it is 9 feet high, 6½ feet wide (such being the length of the axles), and 16 feet long as before.

Price is invariably the leading question in all agricultural affairs, and the chief characteristic of the machine before us is cheapness, arising from its peculiar construction, the principal parts being capable of being turned out by machinery, and put together by any country blacksmith and carpenter, should millwrights not be accessible. The links of the chain of the straw carrier, for instance, are constructed of cast iron, and can be turned out at a small sum per thousand; the wooden rods of the straw carrier can be turned or compressed, and sold in the same manner; and the slats of the riddle, both wood and iron, notched and sold at so much per bundle of one thousand each, all ready for being put together; so also can the screws. It is facts of this kind which give value to the thing, bringing the whole within the reach of thousands of farmers who have old fixed machines, into which the above-named parts can be put for a few shillings each, exclusive of the patentee's charges, their construction being such that they can be easily modified to suit the peculiar circumstances of every old barn and machine. We know of many old barns and machines being worn out together where farmers in some cases cannot be at the expense of a new machine during their present lease; in others where barns will not admit of it; and in a third case where the pocket interferes; but we know of none which could not admit an American shaker, riddle, and screws, were machinery brought to bear upon their manufacture.

Such are the different parts of the American "thrashing and separating machine," which has been in use for the past two seasons in the United States, where it is fast superseding all others. And although we have condemned the whole as at present put together; yet the different parts can easily be arranged so as to suit all the peculiarities of our practice. We want, for instance, the straw delivered in one place, the chaff in another, the cavings in a third, the clean corn put into sacks on the weighing machine in a fourth, and the light corn and small seeds disposed of by themselves in a fifth and sixth; and all differently, according to their peculiar circumstances. Now all this can

be very easily done without in the slightest degree interfering with the principles on which the machine is constructed, or much increasing its price; and, therefore, we hope some enterprising practical party will take it up, and give it, what it deserves, a fair trial, both as a new machine and for improving many thousands of old ones, where heavy losses are sustained both in the corn and straw barn, which we have no doubt the straw-carrier, riddle, and screws would obviate.

The other thrashing machines exhibited in motion in the yard, or otherwise, are too well known to require description. In the yard there were four in motion adapted for large farms, and two or three upstairs of a smaller description, not in action. The different machines all aim at thrashing, shaking, riddling, winnowing, and putting the corn into sacks ready for market, and in this have obviously made considerable progress since last Christmas show. Those exhibited outside elevate the dressed corn by means of cups upon an endless belt, driven by the machine after the manner of a dredging apparatus. It is something to see machines in motion; and empty, overcrowded and dirty as the yard was, this was certainly the most attractive and important department of the whole exhibition, and would have been tenfold more so had there been room and accommodation, with free access to it; but the tickets, narrow stairs, and police prevented thousands from examining it who otherwise would have learned an important lesson here. The machines were nearly on a par as to merit, having all of them, to the best of our knowledge, obtained prizes at one time or other. Two of them had Hart's patent straw shakers, viz., that of Clayton, Shuttleworth, and Co., and Barrett, Exall, and Andrews. Garrett and Son's shaker was composed of sixteen alternate moving bars driven by a crank, each bar having three spikes or teeth on the upper side, which remove the straw from the drum, when anywise damp, fully as well. That of Tuxford and Sons' shake the straw by means of a large riddle—in other words, they riddle the corn out of the straw. There are thus three kinds of shakers, each of which has something in its favour, and something against it; but, putting the black and white together, Hart's is obviously constructed on the most improved principle. In each case clean shaking depends upon the length of the shaker; so that if every kernel of corn is not removed from the straw it is because the shaker is too short. Long, soft, and leafy damp straw is worse to shake than when it is clean, hard, and dry, and therefore would require a longer shaker; and, although the maxim in practice is to make it long enough for any quality of straw, experience in our different climates, we fear, has not certified this length yet. But where parties find the work improperly done when the corn is damp, provision could be made for joining an addition to Hart's shakers at pleasure; and, therefore, although crank motion and the lowering of the straw to a level below the drum may not be approved of, no objection can be found to the work performed by our improved shakers. Indeed experience has yet to decide whe-

ther they have found a rival in the American, in many peculiar situations, either as to expense or efficiency.

Hornsby and Son have added to their prize thrashing machines screws, nearly in the same manner as already stated in the American, for conveying the corn, short straws, and chaff to the dressing machine, equalizing its delivery, and hence enabling the fans to make better work. That this is a most important improvement no one will deny who has any experience in the corn barn and acquaintance with machinery. Between the two riddles of the winnowing machine they have also added a *patent board or return*, for bringing back and delivering the corn from the top one to the front end of the lower, which allows the top riddle to be made longer, and hence more effective. The "tail spoutings" are returned to the drum by the screw, as in the American.

Mr. Arding, of Uxbridge, exhibits his "patent monogram bolter thrashing machine," which deserves notice more for its novelty than merits, perhaps. The drum is five feet long, has twelve beaters, and a wrought-iron screw below, which can be screwed closer to, or further from, the beaters, as circumstances may require. It is twenty-two inches in diameter, so that the beaters are very close together; moves at the rate of 1,100 revolutions per minute. Its peculiar province appears to be for thrashing straw for the metropolis, and other places where grooms object to its being broken.

Baratt, Exall, and Andrews exhibit their horse-gearing for thrashing machines, which has procured for them so much well-earned fame. In the Great Exhibition of all Nations in 1851 few things were more admired. Everywhere its mechanism, manufacture, and efficiency have been acknowledged as possessing the highest degree of merit. Indeed a long winter's evening would not suffice to read the testimonials in its favour.

Of hand-dressing machines there were numerous examples. Those of Hornsby and Son, which received prizes at the Gloucester Meeting, were the most deserving of notice. In this department of the barn this firm has long been distinguished, and of late several minor improvements have been added to their former excellence. Nalder and Knapp exhibit their patent winnowing-machine, whose novelty deserves notice, although its merits may yet be questioned. It has a wire cylinder inside, not unlike that of the American outside.

If the dressing-machine of the thrashing-machine technically termed in some provinces "the mill-fan," could be got to bag the corn for market at once, it would certainly be a great improvement, as that would render hand-dressing machines of little use. The hand-dressing of corn we have always regarded as a heavy drawback upon the expense of thrashing; and therefore our improved machines which do so have the greater merit. At the same time, no farmer could do without a hand-winnowing machine for various minor purposes about the barn occasionally. Every effort, however, should be made, and encouragement given to

do without them as much as possible. We know several instances where the thrashing-machine has two winnowing-machines attached, the second being fed with an endless belt and cups, and where one man thus measures and sacks up the corn as fast as thrashed. This requires more steam, water, or horse-power; which is much cheaper, after all, than hand-dressing. But the application of the screw and double riddle, &c., of Hornsby and Son's machines, is tantamount to two winnowing-machines on the old plan, if the fans are properly constructed; so that, if we have not already arrived at something bordering on perfection in this department, we are at least not far from it.

Of fixed steam-engines for thrashing there were several exhibited. Barrett, Exall, and Andrews who obtained the second prize at the Gloucester Meeting, showed theirs. On large farms fixed engines have many things to recommend them. The day is not far distant, we hope, when every farmer will have a thrashing-machine; and on large farms the manufacture of food for cattle, and other jobs, will require the constant labours of an engineer, with the steam up, ten hours every day of the week, so that the question of a portable engine becomes a very problematical one. Should we arrive at the steam-plough, one engine and engineer may do the whole work upon a small farm; but even in this case we would have the thrashing part fixed, as this can be done at less expense, and much stronger and better every way. Where one farmer occupies more than one farm, the whole ought to be conjoined, and distance overcome by means of railways. We are doubtless here going ahead; but in these days of progress it is no more than prudent to look a little before us. Garrett and Sons also exhibit a most superior fixed engine; and so do Tuxford and Sons; while those who have not space do their best to supply the place of realities by drawings, &c., &c.

Of portable engines for thrashing-machines, we have to notice seven examples exhibited—six outside, and Clayton and Shuttleworth's far-famed light one upstairs within. The above firm also exhibit their six-horse power portable engine in the yard, driving their bolting, thrashing, straw-shaking, riddling, winnowing, and bagging-machine, which finds in Ransomes and Sims, driving Lawson and Sons' flax-scutter, a very honourable rival. It were difficult to say, in the absence of any other test but the eye, which of those engines possessed the greatest merit, and did our limits permit to enter upon details, we could say much for the mechanism, manufacture, and efficiency of both. The other four were also prize-engines, and belonged one to each of the four firms of Garrett and Sons; Barrett, Exall, and Andrews; Tuxford and Sons; and Holmes and Sons.

There is no department of the exhibition where greater progress has been made than this, or which elicited greater approbation; and had there been sufficient space for the other manufacturers of engines to exhibit, it is difficult to say what the result would have been. Had the department occupied by the cattle and sheep, for instance, been appropriated to engines and

thrashing-machines, and free to the admission of all, as the implement department upstairs was, it would have called forth ten-fold attention. The agricultural interest now sees clearly its dependence upon steam and machinery in connexion with it; so that taking but a passing view of things, it is easy to discover the reason why all eyes are turned in this direction at present—why the small crowded yard outside, with all the barriers thrown in the way of visitors, was so eagerly inquired after—and why the implement department, as a whole, was always so much more densely crowded than that of the cattle. In the cattle department, one had no difficulty of walking about at ease, and examining the stock; not even excepting those which obtained gold medals, but upstairs it was no joke shouldering through the densely crowded passages. Indications of this kind have their value, pointing in the most conspicuous manner to the progress which agricultural science is here making, and the necessity there is for the Smithfield Club turning its attention to the influence which steam has upon supplying our markets with “the cheapest and best meat.” Here there is none of that languid polysarcian inactivity to be seen in the cattle department, once the steam is up; but unflinching and untiring action without cessation—the very panacea for agriculture. Long has she been complained of for her stand-still inclination. Horace ever in his day says:—“*Rusticus expectat dum defluat amnis, at ille labitur et labetur*”—a sentence not long since applicable to more than Roman provinces. But steam has raised the wind—clearing our valleys of every cloud, putting sympathetic action in every farmer’s sleeve. New ideas are fast taking possession of the British farmer, demanding facilities for their expanding energy not hitherto required. When we look back to the days of our forefathers, and behold them toiling early and late with their weary flails, and winnowing their scanty yield of corn in the cold draught or freezing winds of winter, between two open doors, and when we look at the engines and machines attached in motion before us, we have reason to conclude with no ordinary degree of satisfaction that British agriculture is progressing in this department of science, however inadequate may be the place allowed her by the metropolis to exhibit that progress, and the blessings which it is calculated to confer upon all classes of the community.

REAPING MACHINES.

Since last year, considerable progress has been made in this department. The two American machines which created so much stirring excitement in the Crystal Palace of 1851, and so much public discussion among farmers after their trial in the harvest-field, have, with all the improvements made upon them, been superseded. One of them has done its best to maintain its ground, and did not yield to its successful rival without first having established its own merits as nearly on a par. The prize, however, was fairly won; and our own old machine, with improvements, now takes the lead among the long list of competitors. “Little

money” is always a captivating introduction to any new machine, and the price and simplicity of Hussey’s left a very favourable impression on the minds of farmers and implement makers generally when it first made its appearance in the hands of its inventor; but, although cheapness is still a very important recommendation, it now appears not to be altogether sufficient to gain the approbation of the public, for at present work done is more the grand criterion of value than price. The agricultural mind in this respect has undergone an unexpected change; for even at the last Christmas Show in Baker-street, where Bell’s reaper appeared for the first time, many shook their heads at the price, as if such would be a barrier to its success. Such, however, has not been realized.

When the judges of the Royal Agricultural Society of England awarded the prize of £20 to Bell’s improved reaper, the merits of its rival already mentioned were not overlooked, but recommended to be incorporated with itself; which has been done, and its efficacy tested by a series of experiments. And what adds to the value of the improvements is the fact that they have met with the unqualified approbation of Mr. Bell himself, whose long experience gives to his judgment a practical and two-fold value. For the prompt manner in which the recommendations of the judges at Pusey have been carried out, Mr. Crosskill deserves consideration, as it amounts almost to a whole season gained. One of the great barriers in the way of improving this machine is the fact that it can only be successfully done during the few weeks of harvest. Implement makers who have farms—as the majority of our large firms have—may cut green corn at the commencement, and allow fields to lie uncut long after they are ripe; but such experiments, our readers will perceive, are attended with a very heavy sacrifice of crop in both cases. Had no such sacrifice been made, the merits of the improvements could not have been attested by practice before harvest 1854.

The machine has been entirely remodelled, having undergone some very important improvements in its general mechanism, besides the adoption of Ogle’s knife, increasing both its portability and strength. The clumsy-looking obtuse angle behind, for instance, formed by the framing, has been superseded by a straight bar; the elevating and lowering of the reel brought more easily under the control of the driver; and the mode of communicating motion to the knife very much simplified, giving to the machine altogether a more workman-like and effective appearance. The old machine, as exhibited in the Bazaar last year, was anything but fascinating to the eye—indeed, to the mechanical student its contour was forbidding; but its parts are now brought within proportional dimensions, promising at first sight, and increasing in value the more narrowly they are examined. Descending to details, for instance, the quality of the apron has been improved, being now stronger, and less subject to damage from damp or wet corn. The serrated knife slightly differs from and is superior to any that has yet been tried, and every other part similarly improved;

so that the machine, as a whole, holds out very flattering prospects for crop 1854.

Atkins' patent automaton reaper is deserving of special notice; for as a piece of ingenious mechanism it had not its equal in the Bazaar. It has undergone some special improvements since the Gloucester Meeting; and although we cannot warrant success in all cases, yet, from what has been done, there is evidently no reason to despair of such ultimately being realized; so that the "self-acting raking apparatus" may yet supersede Bell's apron. Both have the same object in view—the bringing of the corn as it is cut, and laying it out of the wake of the machine: with this difference, that the former lays it down in sheaves, while the latter leaves it in a swathe—a difference greatly in favour of the automaton; for the laying of the corn in sheaves saves the work of several hands in the binding, a result of the highest importance. In the western prairies of the United States, where the crops are more equal and free from lodging—in short, altogether better adapted for being reaped by machinery—it has been wrought, and obtained numerous prizes; so that the question may be started as to whether it would not be prudent to have machines constructed so that either the self-raking apparatus or the endless apron might be used at pleasure, according to the state of the crop. Independent of the automaton, the machine with which it is connected has undergone some very important alterations in the cutting and gathering apparatus, &c., since last year.

CHAFF AND TURNIP CUTTERS, BEAN MILLS, OILCAKE BREAKERS.

Machines of this class always occupy a prominent place at our Christmas Exhibitions in Baker-street. Of the long list deserving of notice, Biddell's patent bean cutter is almost the only article which falls within the narrow circle which our limits describe. This machine very deservedly received the silver medal of the Royal Agricultural Society, at Gloucester. From the simplicity of its construction, its advantages are observable at first sight. It is a new implement, and its novelty consists of the cutting apparatus being formed of separate triangular prism-shaped rods of hardened steel, fixed at the ends in triangular orifices, equidistant from and near the circumference of cylindrical plates, by two rings, screwed on to their outsides so as to cover the ends of the rods, the rods between the two plates thus forming a fluted drum. The two cylindrical plates can be fixed upon, or keyed on to, a revolving shaft, driven by hand or other motive power in the usual manner. The triangular rods, or "teeth," as they have technically been called, are equilateral; and hence each tooth has three sharp-cutting edges, so that when one is blunt the end ring may be unscrewed, the tooth taken out, and another sharp edge brought to bear upon the operation of cutting; and when all the edges are blunt, a new tooth may be put in by any labourer, at the small cost of twopence, or five shillings for an entire set of new teeth. The teeth thus not only last thrice the length of time as those of the ordinary

description, but they can be renewed for a mere trifle; and, more than this—for from being manufactured separately they can be better tempered than otherwise it is possible to make them. When the teeth of the common sort become blunt, they may be sharpened once or twice it is true, but the expense is great, while the mill soon gets useless; whereas the new machine in question may be said to "renew its age like the eagle" for less than the expense of once sharpening the old—commendations of the highest importance to farmers. The teeth act against moveable breasts, which may also be renewed for a mere trifle. Breasts of different thickness will regulate the feed; or this may be done by a screw working in the breast. "The best proof of the pudding is in the eating," and the fact that upwards of one hundred mills were sold by Ransome and Sims on the show ground of the Royal Agricultural Society at Gloucester speaks for itself.

W. P. STANLEY'S GLOUCESTER PRIZE STEAMING APPARATUS.

The cooking of food for live stock is deserving of even greater attention than has hitherto been paid to it, if that were possible; for it is not enough to cut our straw and roots, bruise or grind our oats, barley, beans, &c., as we now generally do, but these ought to undergo the process of mixing and cooking afterwards in a more consistent and economical manner, in order to bring them to their greatest value: and it is to these latter two operations that the exhibitor has turned his attention. The field before him is one of the widest and most promising in connection with agricultural chemistry, and we have much pleasure in reporting progress in it since last year. We alluded to this department under Fixed Steam-engines, and again beg to express a hope that the day is not far distant when every farmer will have the steam up in his *cook shop*, serving out to horses, oxen, sheep, pigs, and poultry, their respective rations according to the most approved and scientific formula. Physiologists have long been familiar with the fact that the ox is just as nice in his taste as his master, if not more so; and if any farmer proceeds with this rule to his feeding-house, he will find ample room for reformation.

In machines and implements connected with hay-making, the progress during the last year is no more than deserving of passing notice. Some of the reaping machines are also made for mowing grass, but the problem here has hardly yet been practically solved.

PLOUGHS.

The past year is a memorable one in the history of the plough. From time immemorial it has been looked upon as emblematical of agricultural prosperity itself, honest rusticity never suspecting the contrary; but during the last year many began to eye it with jealousy, while a few condemned it as no longer worthy of confidence—a hard sentence, doubtless; one far from being in accordance with the ordinary course of rural affairs; and, therefore, it need not be wondered at that the plough on the present occasion remains *in statu quo*, as it were. According to our bygone notions we

can form the idea of a *perfect plough*; and no one did more to reduce such an idea to practice than the late Mr. Howard, of Bedford, whose successful labours in this department will long be remembered. Latterly however Busby has carried off the palm in competition. According to the last prize list of the Royal Agricultural Society, W. Ball and Ransome and Sims stand next in the order of merit. Alterations have annually been made in order to effect a more perfect solution of our problem; and, independently of the go-a-head prognostications of the past year, that we have gone far enough in this direction, the above four houses, with others, have not altogether been standing still, each having done something towards obtaining the grand desideratum at issue, although the progress altogether made has not been great.

DIGGING OR FORKING MACHINES.

Forking by rotary action has long been a favourite problem; and Mr. Samuelson, of Banbury, deserves our notice for the progress he has made during the past year in effecting its solution. The "Forker," as an implement of cultivation, presents a singular contrast with Busby's plough on the opposite side of the avenue of the Bazaar. Any person wholly unacquainted with agriculture would have looked with some astonishment had he been told that the former aspired to be the rival of the latter; nevertheless, such is fact; for the "forker" is the most formidable rival the plough has ever yet met with—one which is fast turning ideas into a different channel, so that it is difficult to say what the issue may eventually be.

From time immemorial, spade husbandry, or digging with the spade or fork by manual labour, has been acknowledged superior to ploughing, yielding a much greater return of produce. This does not arise merely because the spade or fork turns over the sod better than the plough, burying and effecting the rotting of any vegetable matter more consistently with the fertilization of the soil, but also because it deepens and pulverizes it more effectually. But such an increase of manual labour as that which spade husbandry demands is altogether incompatible with the progress of modern science; and impossible, besides, from the state of our population and labour market—to say nothing of the rise of wages, and extra expense which such a system would create were it generally introduced. Subsoil ploughing, grubbing, scarifying, horse-hoeing, clod crushing, and harrowing involve the same theory of deepening and pulverizing the soil; but, however, necessary the practice may be in some exceptional cases, it is upon the whole, on properly-cultivated farms, "far fetched" and expensive, when compared with forking by horse power; and, what is worse, not so effective. In short, rotary forking is the nearest approximation that has yet been made to spade husbandry, as adopted in the more perfect cultivation of the soil by horticulture when compared with agriculture.

This important acquisition to our stock of mechanical agents during the past year is deserving of a more de-

tailed investigation than our present limits will admit. Deep and permanent cultivation is its grand characteristic; and the deeper we dig into its merits, the more important and valuable they become. It is no superficial operator itself, if left to its own weight with sufficient motive power in front; and to understand its action and effect properly, one has to follow its steel claws into the soil, observing carefully their ingress, egress, and progress throughout.

The machine, when not in operation, is borne on two wheels, which regulate its depth when at work by means of a crank and rack-wheel behind. The forking apparatus consists of a series of small wheels, with curved steel prongs or claws on their circumference, in number according to the width to be forked. Each wheel may be technically termed a rotary fork, or simply a fork; and the prongs claws, from their peculiar action and curvature, resembling the claws of the mole or rabbit. The series of forks revolves upon an axle in a heavy subdivided cast-metal frame, having stripping apparatus, or a corresponding number of subdivision bars, from their claws as they rotate in forking. The weight of the framing corresponds with the length of the claws, and the two may respectively be increased in weight and length to suit any depth of cultivation required.

In forking, the claws are forced into the ground by the mere weight of the machine in the first instance; but after they have attained to their proper depth, their action becomes more complicated; for, as the machine then remains at this depth, exacting a given pressure downwards while it is drawn forwards by a greater power, we consequently get involved amid counter-acting forces—the first, downwards vertically; the second, forwards horizontally; and the *third*, upwards and rotatory, arising from the action of the claws in lifting and loosening the soil behind. The first force is that of gravitation, and therefore is a given quantity—the weight of the machine—and may be represented by a straight line perpendicularly dropped, as it were, from the axis; the second force is equal to the first and third, or their sum, and may be represented by a line from the shoulders of the teams; and the third, the difference between the first and second. It is an invariable quantity, according to the nature of the soil, and therefore may be represented by the curved lines which the point of the claws describe within the soil, and the resistance which they overcome in passing through it. The former two are easily disposed of, the first being given, and the second determinable by the dynamometer; but, although the third may be indicated by the difference between the first and second, the former being suspended with a cord to a fixed dynamometer over a pulley, yet there are some very nice mechanical questions not so susceptible of a satisfactory solution—questions upon which the practical value of the machine depends. When the soil is equal in quality throughout, and the resistance uniform, the curves will also be equal, and the effect produced accordingly; but if the soil is unequal, and of less depth than that required for forking, being incumbent on

rock, moorband, &c., &c., the curves and effect produced will be less, while the resistance may be greater. If, for instance, an inch or two inches of a hard subsoil is loosened by the claws, and the soil incumbent is of a light and loose quality, then the points of the claws will come in contact with this subsoil before they arrive at the line of gravitation representing the first force, and therefore before it can be brought to bear upon the work. At this moment it is being acted on by the preceding claws, now sunk, we shall suppose, two inches in hard moorband, so that they act as levers to the second force; while the resistance the points of the next claws following them experience, acts as a fulcrum; but the points of the latter claws, owing to their curved form, enter the hard subsoil; the consequence of which is, that the upper part of the claws are drawn forward less or more into the light soil above, in proportion to the resistance which the points of those acting as levers meet in loosening the moorband and stirring up the soil behind. And the looser the surface soil, the less will be the effect produced upon the subsoil under a given depth, because the fulcrum is lower, and the curve less; while the second force or the draught of the horses will correspond with it; but *vice verâ*, the harder the surface soil is, because it then acts as a fulcrum.

Three things are here deserving of more special notice—the proper curvature and action of the claws; the loosening of the soil and subsoil; and the uniform weight of the machine.

The curvature of the claws is one of the most important features of the forker, being that which gives to them the easiest and most effective action. In form they very much resemble that of the claws of the mole and rabbit, as already stated; and their *modus operandi* only differs in this, that the power (the muscular action of the horses) in their case is placed in front, whereas in the other it is placed behind—a difference which resolves itself into a matter of mere accommodation to suit two results of an opposite character. In both the curvature of the claws plays a most important part, owing to their peculiar action; for, were they straight, then, in neither case could they be used to advantage, because they would then be parallel to the surface to be acted upon, and consequently have to enter it sideways, or not at all, when hard; whereas, when curved, the points enter first, the body of each claw following to a certain extent the identical line which its point describes, so that in penetrating to the depth required they meet with the least possible resistance when properly curved, while in loosening the soil behind, they mix and do their work better than if straight. This arises in the case of the forker, from the fact that the curve which the points of the claws describe is cycloidal. Altogether, the arrangement here involves, probably, one of the nicest and most important questions in connexion with agricultural mechanics.

The claws, after they arrive at the line of gravitation, act as levers in loosening the soil behind, and prior to this as a fulcrum the moment they enter the soil in front. In other words, as the horses pull the former out, they just draw the latter in; and so the ma-

chine continues to fork onwards to the opposite headland, its weight merely counteracting any upward tendency. Consequently the longer the claws are, or the greater the diameter of the wheel in which they are fixed, the greater will be the lever power of the horses; and hence lighter draft. But, on the other hand, the greater the diameter the larger the number of claws, and hence resistance which they would experience in the soil; so that the question resolves itself into a very important one for the dynamometer to solve.

The lever action of the claws may be illustrated by the common spade or fork in digging. When once the fork is driven into the "tread" or "tramp," the latter rests upon the soil behind, which acts as a fulcrum, when the digger presses down the handle. Now, if we lengthen the prongs of the fork some six inches, and weld other three-curved prongs to the back of the tread, so that their points shall enter the soil the moment the handle is moved backwards, then, in pressing down the handle, the digger forces the curved prongs behind into the soil, if it is not all the harder, the tenacity and weight of the spit in front counteracting any upward tendency, irrespective of the weight of the fork. Or if holes for hand-spokes are formed in the rotatory forks, then they may be turned like a capstan, another mode of exemplifying the lever action of the claws.

The aëration of the soil is one of the most important results of the forker; for by its operation it may soon be rendered of a proper depth, and pulverized so as to turn manure to the best advantage. It may not be so by once forking, in many cases. If the subsoil, for instance, is moorband, or the like, the claws may only loosen a small part of it by the first going over; or, if soft, wet, and unctious clay, they may strip through it in the winter; and, therefore, parties have no right to be disappointed at results of this kind. But perseverance in the former case will loosen the whole; and, if the latter is wrought in a proper state of dryness where such can be obtained, a similar result will be effected, or flat-pointed claws will loosen and bring up the toughest clay. A little experience will enable parties to get over difficulties of this kind very easily. In its present form the forker is only given as an auxiliary to our other implements, and as such accepted by us; but this has comparatively nothing to do with the question at issue, for in its present state there is plenty of work for it, and it is difficult to say what it may not accomplish if improved. The soil, by being deepened and pulverized, is greatly increased in fertility, and capable of growing almost any kind of crops. Any length of evidence might be advanced in proof of this, were it necessary.

The uniform weight of the machine, upon different soils and under different circumstances, leaves room for improvement. Land, when first forked, requires a heavier implement than it will do afterwards, and heavy soils than light. Now, to carry the extra weight on wheels when it is not required is both a waste of power and materials. We would, therefore,

suggest that the framing be made of wrought-iron, and provision made for adding or taking off weights at pleasure. The very fact that the forker will subsequently be easier drawn, when once the soil is brought fairly under its operations, is one of its most prominent recommendations.

The value of this new machine ought not to be estimated barely by its present merits; for it must also be accepted as the first successful pioneer in a new system of cultivation. It is in fact a most important addition to the mechanical department of agricultural science.

Various minor improvements have been made among scarifiers and horse-hoes, to advance them another step. Emigration, and its effects upon the labour market during the past year, confer upon the latter a twofold importance. To hoe "heights and hollows" equally well with the level surface, and the zig-zag windings of the drills as well as where they are straight, has long been experienced a difficult task to perform by the horse-hoe, both among corn and turnip crops; and this is just the problem which Mr. Nichol's patent horse-hoe, manufactured by Mr. Williams, Bedford, solves by means of a vertical-pressure motion, each of the hoes being regulated by a wheel in the former case, and by a horizontal steering motion in the latter. The hoe, although involving much ingenuity, is yet a very simple implement, and recommended in the most flattering terms by those who have tried it.

Of seed and manure drills we have to say "ditto" to the above, and the same for carts and waggons, with a long list of hand implements, &c., &c., in all of which various minor improvements have been made during the past year.

Of the new things which appeared at our Christmas Show this year for the first time, only three more can be noticed—viz., a flax-mill, a brick-making machine, and Odams's patent blood manure.

The flax-mill, or breaking and scutching machine, is the property of Samuel Lawson and Sons, engineers, machine-makers, &c., Leeds, and is one of the most simple, perfect, and important specimens of mechanical ingenuity which has ever made its appearance at any of our previous Christmas shows; and besides this, its appearance at the very time when its services are required, as they now greatly are, doubles its value.

Up to a recent date there existed a very strong prejudice against growing flax—so much so, that stringent covenants were inserted in almost every lease prohibiting its cultivation; but, with the progress of chemical and geological science, the introduction of artificial manure, and a more perfect knowledge of cropping, such prejudices have given way to an anxious enquiry after its growth. This has taken place not merely on account of the fibre for flax, but also the "bolls" or seed for feeding cattle. From the strong objections which had been established against it for so long a time, many are entirely ignorant of its cultivation; and the few who have seen it grown in their young days have only a notion of practices out

of date; so that it were difficult to say which of the two parties has the most to learn. We lately met, for instance, with two examples, both anxious to grow flax for the bolls especially. Our old friend had grown it extensively some forty years since, but not for bolls, and, being familiar with the peculiarly watchful attention which the plant requires in all its stages, from the seed to its being sent to the scutch mill, was afraid to ripen the seed, for fear he should lose or injure his flax, besides getting laughed at. Our young friend, on the other hand, had no experience of its management, but, being a scientific man of some eminence, succeeded in growing a light crop of the finest quality, and in ripping a fine return of bolls; but he could not separate the flax from the straw. Indeed, he was disappointed at its length. In short, although aware that quality did more than compensate for quantity, he did not know either when he sowed them, and therefore hastily concluded his flax would not cover the expense of an experiment; consequently, when we saw it, it was being used for littering the folds, although worth nearly twenty pounds per acre! Our provinces (the north of Ireland almost only excepted) are full of examples of this kind, numbers coming annually under our notice; and Mr. Lawson mentions that they had the offer of large quantities of flax lately, at a very small fraction of its market value. Hence the importance of more attention being paid to this branch of agriculture, and the timely appearance and value of the flax-mill before us.

After flax is retted, it undergoes three operations—breaking, scutching, and hackling—as our readers are aware, before it is fit for spinning. The latter (hackling) is, and has long been, a branch of labour by itself; but the former two, although separately performed, go together generally, though not always, being undertaken by one party—the "scutch or flax-miller." Both operations are rudely performed, a vast amount of fine flax being broken into "tow" or waste, while the whole is injured in quality. This waste arises from the flax being broken by a series of blows or hasty percussion strokes between two sharp, fluted-edged instruments, in considerable quantities—generally three or four sharp strokes before a change in the position of the flax is made. It is then taken in handfuls, the miller holding one end firm as he allows the other to fall over the edge of an opening upon the arms of the scutch mill, revolving horizontally, which separates the fibre or flax from the "bone" or woody part of the plant, the latter being generally termed the straw, and the former the flax. As the handfuls are operated upon on one side, the miller turns round the other; and when the first end is scutched, he then reverses ends, and scutches the other. Now, if the flax is cut by the chopping operation of breaking, it is equally, if not more, wasted by the scutching; for before the interior of the handful is properly done, the outside is injured. The former of these operations has in some places been superseded by breaking the flax between rollers, for the last twelve years or so; but in the majority of our provinces such

is not known, while the operation of scutching is even much ruder than what we have stated, the work being also done by blows, by means of a "hand scutch," or thin piece of wood, over the edge of a beam or stool, on which the operator sits astride, destroying much more flax than the arms of the scutch mill itself. It is necessary to bear in mind the antiquated character of such operations, before we can form a proper conception and estimate of the value of that which we now proceed briefly to notice.

In separating the flax from the straw by the hand, as when examining its quality, we take hold of a single stem between the points of the thumbs and fore-fingers, the points of the thumbs and fingers being close, and opposite to each other. Then, beginning at one end of the stem, we with a gentle rubbing action work to the opposite end, loosening the flax from the straw as we proceed, breaking the latter. When this is done, we next, holding the broken stem between the points of the thumb and fore-finger of the left hand, gently strip it downwards, between the nails of the thumb and fore-finger of the right hand, removing the broken straw from the flax, which concludes the operation. And such is the *modus operandi* of Lawson and Son's flax machine. The flax, in passing in between revolving rollers, is broken, and, in being drawn out again, the straw is stripped out with a gentleness and nicety exceeding anything which the thumb and finger could perform, leaving the flax at all the length it grew, and free from any waste, so that the operations of breaking and scutching are performed by one machine at one and the same time, which is the peculiar characteristic of the invention. It will be necessary, however, to enter a little more into details both as to the machine itself and the mode of working it.

The machine is almost entirely composed of iron, and is double, there being two machines working within one cast-metal framing, by which a considerable economy is obtained both in the construction and management. The principal working parts of each are a pair of rollers, a vertical alternate-moving framed beam (also of iron), and a set of six or more flax-holders made of wood; so that there are four rollers, two beams, and two sets of flax-holders altogether. Each roller is divided into four lengths, each piece being differently fluted—finest at the finishing end, and coarsest at the commencing. The rollers are fed from above, so that they move inwards, and at the rate of 150 revolutions per minute. The two alternate-moving beams are framed or hollow, oscillate above the rollers, one perpendicularly between each pair, and are open at the bottom. Each flax-holder is composed of two pieces of wood, between which a handful of flax is held firm. In length it is equal to one of the divisions of the rollers, or, judging by the eye, about twenty inches, and slides lengthways in the interior of the beam, each beam holding six of such flax-holders, four above the rollers and one at each end, for the feeding and discharging. The rollers break the flax as it passes in between them, and scutches it as it is drawn up against their motion by the beam in its ascent. The beams hold

the flax-holders, directing them, as they descend perpendicularly to the rollers, and drawing them up again when they ascend; and the flax-holders hold the flax by one end—the part operated upon by the rollers being suspended below—so that when they descend close to them, the whole is dressed to a given length, passing down and up between each of the divisions of the rollers before it is finished, when it is then reversed in the holder.

In working the machine, manual labour is subdivided in the most economical manner possible. If no flax is wasted on the one hand, as little labour is lost on the other; the principal amount is in filling and emptying the flax-holders, and this may be done by boys or girls. In doing so, the flax is spread along the whole length very thin, so that it is equally operated upon on both sides of the stems by the rollers. This, and the longitudinal movement of the holders along the rollers their own length at each alternate vertical motion of the beam, the flax passing between finer and finer flutes at each oscillation, until it passes through the four divisions, constitute the peculiar characteristics of the machine—that on which its novelty and merits mainly depend. The work of filling the holders is so simple, that any boy may learn it in a forenoon; if not, all the greater a dunce. Six or seven boys or girls are required for each machine, besides two lads to both—one at each end, for entering and removing the flax-holders—each machine taking in a holder with unbroken flax at one end, and discharging another at the opposite end with scutched, in about eight seconds—the time of one oscillation of the beam; so that the one lad in feeding both enters a holder every four seconds, and the other removes one in the same time, which keeps them in motion, as well as the six or seven boys or girls who fill and empty them in this short period.

Let us now follow a holder with unbroken flax right through the machine, until finished for the hackler. The beams, as we have said, extend one length of a holder over the rollers at each end. Into this length, at the feeding end, while it is descending and ascending, the lad places a filled flax-holder. When the beam rises to its extreme height there is a short rest, during which the holder is pulled forward above the first division of the rollers, having the coarsest flutes. In descending between these the flax is broken, and in being pulled up again is partially scutched. When the holder rises to the top, it is again drawn lengthways right on above the second division of the rollers, having finer flutes than the first. In being taken in between these and pulled up again, the small tough stems which may have escaped the first operation are broken and scutched, and so on for the other two divisions of the rollers having finer and finer flutes; and when it rises from between the last it is drawn forward over the rollers to the second lad for removal, the lower end or half of the flax being now finished for the hackler. The scutched end is next thrown across one half of a holder, and the other half clapped upon it and fixed, when it again passes through the machine, the whole

length of the flax being now operated upon, leaving it ready for hackling. The object of passing the flax so often between a series of rollers differently fluted is not only to prevent the waste formerly complained of under the old system, which it obviates in the most effective manner, but also to remove any roughness from the outside of the fibre, and to polish it as it were, which it does to a nicety, giving it a gloss like silk.

Such will give a general idea of this invaluable acquisition to our agricultural machinery. We cannot too earnestly recommend it to landlords. There are in our provinces many a village where, if one were started, it would soon find employment; conferring benefits not very easily estimated. As to capital, the prime cost of the machine, with a two-horse engine, is almost all that is required, as such could be started in any empty house. In short, we have seldom met with a more inviting investment for capital on the one hand, or machinery calculated to confer so important results to the community at large on the other, than Lawson and Sons' "flax mill" is to our rural villages and provinces generally.

Clayton's new brick-making machine was not exhibited in the Bazaar, but at his own works, Upper Park-place, Dorset-square, adjoining, in operation. The novelty consists in a die at the mouth of his pug mill, with a vertical roller at each side, of a peculiar construction, which rotates as the clay is expressed. The roller is composed of perforated zinc covered with fustian, which is kept wet by means of water admitted to the interior of the roller, so as to prevent the clay adhering to it. Its action on the expressed clay is of a twofold character—compression yielding a more solid brick, and a sharpness of angle unattainable through a common die. According to experiments made when on exhibition, it turned out about as many bricks as five sets of men, each consisting of a "pallet" and "clot" moulder and five other hands—or 25 bricks per minute, 15,000 per day—while it only requires one man and two boys to work it. The whole operation of pugging and expressing the clay is performed by one horse; and the draught is not considered much heavier than when pugging only, owing to the advantage of the rollers. All this, of course, is only one stage in the manufacture of bricks, the more important one, "the burning," remaining; but, so far as appearances go, expression and compression being uniform, the "problem" which has so long been experienced as the puzzle of the brickyard has at length been solved, so far as bricks alone are concerned.

The American thrashing machine, it is said, is made up of a series of old patents slightly improved: and it is rather singular that we should meet with the same in the above brickmaking machine; for the first attempt ever made, we believe, at anything of the kind by machinery was the expression of clay through dies at the bottom of a pug-mill upwards of twenty years since (see prize essay on drain tile and pipe machines, "Quarterly Journal of Agriculture," Nos. 41 and 42) by Mr. Murray, of Garunkirk, and we believe with

rollers at two sides. At all events, the Marquis of Tweeddale and Mr. Boyle both used rollers, as well as several others. But these early attempts failed, for the want of screening apparatus and other improvements. Since then several patents have been taken out for expressing through dies without rollers at the bottom of pugmills, but the machines have not come into general use.

We mention the above—not as an objection to Clayton's machine, but the contrary—to enable us to refute a very silly one which may be brought against it, as it has been against the American "grain separator"—viz., that it is a combination of failures. It is not the value of Clayton's patent that we are discussing, but the value of his machine. Now it matters little to us what combination of useless patents it may involve, for the fact that it turns out 25 bricks per minute with only a man, two boys, and a horse, speaks for itself, proving that it is no failure; and if the bricks come out of the kiln as well as they do from the dies, as they promise to do, no one can deny that a triumph has been achieved in the brick-yard, of national importance. In the absence of a patent, the machine will cost little more than an ordinary pug-mill. The expense of the patent will enhance it a little; but the less the real value of the patent, just so much less will be the increase of expense: hence the absurdity of the objection, whichever view we take of it.

We should mention that the machine exhibited was purchased by his Grace the Duke of Bedford, who will soon test its merits in the most satisfactory manner, from the extensiveness of his buildings; and that it has already received the great medal prize at the Exhibition in Amsterdam.

The Messrs. Gibbs, Half-Moon-street, exhibited some sweets grown by his Grace the Duke of Bedford, whose extra size and quality attracted the eye at some considerable distance, and they handle fully as well as they look. The land on which they were grown was manured by "Odams' Patent Blood Manure," and it is this addition to our artificial fertilizers which falls to our province to review.

Blood has long been acknowledged one of the most enriching of all our manures—a proposition whose soundness has been proved by innumerable experiments. But, invaluable as it is as a manure, little short of 100,000 tons are annually turned to a shameful account in this great metropolis and our other large towns! We say *shameful*, because it is disposed of at a small fraction of its manurial value, and allowed to stand in cesspools and tubs, polluting the atmosphere, thus becoming a public pestilence at a time when we are dunning all the world about more guano. Now that the startling fact has reached the ears of the agricultural public, that Peru will be exhausted of guano in a few years, surely the prospects of an everlasting supply at home will be accepted with some degree of national satisfaction, more especially since the latter is superior to the former in quality. The roots on the stand of the Messrs. Gibbs prove the soundness of this conclusion, for the whole were grown from seed procured of this firm; and those grown with

blood manure were better than those grown with guano. Facts could not say more in favour of any new fertilizer.

The practical question is, to get Odams's patent blood manure fairly applied to the different soils in our provinces during the ensuing season, and the results communicated to the columns of the agricultural press. It will readily be perceived that seedsmen are nearly as deeply interested as farmers; for seed from good bulbs is always better than that from bad. If the swedes exhibited had been raised with blood manure, they had, to a certainty, grown a long way a-head of those of the Royal Dublin Society. Mr. Corrigan, with all his indefatigable zeal for the cause of the Emerald Isle, will have to take care of himself here; for if he goes to the wrong door for guano this year, the result is obvious. The duty and interest of such parties are manifest; and, therefore, their influence ought to be given to get the manure fairly tested.

The manufacturers of the manure are Morgan and Co., Belle Isle, King's-cross; and the agents Messrs. Odams, Pickford, and Keen, 35, Leadenhall-street, London, who will attend to small orders for experiments, as well as large for general crops.

In experimentalizing, the manure should be applied in all the different ways in which guano is

used; but here it would be premature for us to say more.

Having already exceeded by a long way the space allowed us, we must conclude our review of the implement department postponing a long list of new things, entered in our note-book, which cannot be noticed at present, owing to the length of criticism they generally demand, to do justice to their merits while canvassing their shortcomings. The most cursory recapitulation of those we have noticed must satisfy our readers that implement-makers, and others in this department, are making very extraordinary progress in chemical and mechanical science, unprecedented in any other branch of industry, and that the Smithfield Club never exemplified such a prosperous state at any previous Christmas Meeting. At first, the exhibitors in this department were the Messrs. Gibbs and Co. (seeds and roots) and Wedlake (implements and machinery), who did their best to attract the attention of the public to an undertaking of a national character, in a very confined hay-loft in Ipswich Street! And now to have seen the founders of this great work once more beside each other—a work which will redound to their praise while England has bullocks and implements to exhibit—one, the progress and importance of which have attained to a magnitude demanding of the Smithfield Club its most serious consideration.

FEEDING PROPERTIES OF TURNIPS GROWN WITH DIFFERENT MANURES.

BY MR. WILLIAM GOODLET, FACTOR TO LORD BLANTYRE, ERSKINE, RENFREWSHIRE.

[Premium—The Gold Medal.]

A portion of a field of 20 acres, on the farm of Beauchamp, in Forfarshire, intended for turnips last year (1850), was selected for its equal quality of soil and exposure, upon which to grow the lots to be experimented with. The soil is a good friable loam, and the field, which had been manured for a bean crop in 1848, was in wheat in 1849, and ploughed in the autumn with a good furrow for turnips in the following season.

Plot No. 1 got 20 tons of well made farm-yard dung per acre.

„ No. 2 got 4 cwt. of Peruvian guano per acre.

„ No. 3 got 10 tons of like dung, and 2 cwt. of like guano per acre.

The turnip seeds—Skirving's purple-top yellow—were sown on 26th May. They braided pretty much alike; those with guano continued throughout the season to show rather most luxuriance of growth; but on the crops arriving at maturity little or no difference was discernible between them.

From the commencement of the experiment, on 21st October, to its close, on the 10th March, the cattle in—

Lot.		tons.	cwt.	qr.
No. I.	consumed 3 acres 2 roods 27 poles, weighing	96	14	1
No. II.	„ 3 „ 2 „ 4 „ „ „	96	13	1
No. III.	„ 3 „ 2 „ 11 „ „ „	96	10	0

The turnips were brought from the field as required, about an eight days' supply usually being in store; and from first to last they were taken clean and in good order from the field, the tops and roots being left behind. They were given to the cattle by weight and measure.

The cattle experimented on were a lot of two-year-old short-

horn crosses, reared by Sir George Dunbar, in Caithness-shire, brought from their grazings a considerable distance; and after being allowed a little time to recover from the fatigue of their journey, were, on the 21st October, carefully divided into three lots of seven each by competent judges, weighed and put into their respective feeding courts, which are exactly of the same form and construction, having each ample shed-room in a building on their north side, and being surrounded by high walls on the other three sides, with feeding troughs in the open court for turnips, racks within the sheds for straw, and a southern exposure. Lot I. was put on the turnips grown with dung alone; Lot II. on the turnips grown with guano alone; and Lot III. on turnips with half dung, half guano.

The weather was fine and dry when the cattle were put up, and continued so till towards the latter end of December, about the beginning of which were a few days of dull, hazy weather, inclining to frost; and during its continuance all the lots ate about 35 lb. less turnip each beast per day than usual; about the 30th December much rain fell, and till the 13th January it continued very wet. The cattle were observed to scour a good deal, and they ate very little straw; indeed, from the beginning the consumpt of straw was very small. It was then deemed advisable to give them hay. The average consumpt of turnips till this time was 227 lb. each beast per day; but after being put on hay, of which they were allowed as much as they eat up clean (11 lb. each beast daily), the average consumpt of turnips decreased to 216 lb. each beast per day. At the end of the fourth month (that being the shortest period allowed by the

terms of competition for the experiment with turnips alone) it was resolved to give them a small allowance of oil-cake, in order to see the effect it might have on hastening forward their fattening. Accordingly 2 lb. of oil-cake were allowed to each beast daily, along with their hay and turnips; after which the consump of turnips fell to 209 lb., and of hay to 10 lb. each beast per day, and it continued at that rate till the close of the experiment.

During the wet weather in the beginning of January, three of the cattle—one of each lot (No. 2 of Lot I., and No. 4 of Lot II., and No. 2 of Lot III.)—were not doing so well, and were bled, and got each a dose of salts. They soon after recovered, and made up to the others, the bleeding and medicine having had no permanently had effects in retarding their feeding, but, on the contrary, seemed to give an impetus to it after they recovered from the immediate effects of their medical treatment.

All the cattle of each lot were weighed once every four weeks, and four of each lot were weighed once every fortnight. The weighings invariably took place between the hours of three and four o'clock, afternoon. It was feared the frequent weighings might disturb the animals, and probably have an adverse influence on their fattening; and it was thought that weighing the same four fortnightly would be sufficient to test the progressive improvement, and that the bad effects, if any, from the weighings would be seen by contrast with the other three of each lot which were weighed only once a month. It may be mentioned, however, that the cattle generally were very tractable, and by the end of the experiment the weighing seemed to give them no uneasiness, the cattle-man leading them on by their horns to the weighing machine with the greatest ease and composure possible.

The following tables show the progressive improvement in weight during the course of the experiment:—

TABLE I.

Showing the increase in weight in lbs. at the end of every four weeks, from the commencement of the experiment, on 21st October, to its close, on 10th March.

Lot I.—Fed on turnips grown with dung alone.

No.	Nov.18	Dec. 16	Jan. 13	Feb. 10	Mar. 10	Total increase.
	lb.	lb.	lb.	lb.	lb.	lb.
1	66	112	96	104	136	514
2	60	85	90	18	107	360
3	64	65	118	30	123	400
4	56	104	92	44	78	374
5	52	61	74	14	60	261
6	59	66	38	66	67	296
7	46	51	85	90	61	333
	403	544	593	366	632	2538

Lot II.—Fed on turnips grown with guano alone.

No.	Nov.18	Dec. 16	Jan. 13	Feb. 10	Mar. 10	Total increase.
	lb.	lb.	lb.	lb.	lb.	lb.
1	58	54	89	61	84	346
2	71	92	96	59	86	404
3	76	50	77	33	28	264
4	43	41	34	78	111	307
5	80	67	83	48	58	336
6	50	57	91	30	111	339
7	54	57	79	60	72	322
	432	418	549	369	550	2318

Lot III.—Fed on turnips grown with half dung, half guano.

No.	Nov.18	Dec. 16	Jan. 13	Feb. 10	Mar. 10	Total increase.
	lb.	lb.	lb.	lb.	lb.	lb.
1	33	88	99	113	134	467
2	54	85	73	69	98	379
3	31	59	65	46	76	277
4	51	74	105	87	78	393
5	45	82	60	55	42	284
6	29	52	56	43	108	288
7	25	48	64	66	139	312
	271	488	522	479	675	2435

TABLE II.

Showing the increase in weight, every fortnight, of four of the cattle of each lot, from 21st October to 10th March.

Cattle of Lot I., weighed and put up on 21st October, and weighed again on—

No.	Nov. 4.	Nov. 18.	Dec. 2.	Dec. 16.	Dec. 30.	Jan. 13.	Jan. 27.	Feb. 10.	Feb. 24.	Mar. 10.	Total
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
1	26	40	46	66	30	66	54	50	44	92	514
2	24	36	54	31	39	51	lost 5	23	41	66	360
4	28	28	33	66	36	56	29	15	25	53	374
6	41	18	28	38	18	20	26	40	18	49	296
	119	122	166	201	123	193	104	128	128	260	1544

Cattle of Lot II., weighed and put up on 21st October, and weighed again on—

No.	Nov. 4.	Nov. 18.	Dec. 2.	Dec. 18.	Dec. 30.	Jan. 13.	Jan. 27.	Feb. 10.	Feb. 24.	Mar. 10.	Total
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
1	24	34	26	28	48	41	44	17	24	60	346
2	23	48	33	59	38	58	28	31	13	73	404
4	28	15	14	27	32	2	23	55	28	83	307
6	21	29	27	30	46	45	7	23	46	65	339
	96	126	100	144	161	146	102	126	111	281	1396

Cattle of Lot III., weighed and put up on 21st October, and weighed again on—

No.	Nov. 4.	Nov. 18.	Dec. 2.	Dec. 16.	Dec. 30.	Jan. 13.	Jan. 27.	Feb. 10.	Feb. 24.	Mar. 10.	Total
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
1	17	16	29	59	47	52	55	58	46	88	467
2	19	35	18	67	35	38	38	31	47	51	379
4	22	32	28	46	56	49	45	12	29	49	398
6	20	9	27	25	31	25	5	38	36	72	288
	78	92	102	197	169	164	143	169	158	260	1532

According to Table I., Lot I., fed on turnips grown with dung alone, produced an increase in the live weight of 2538 lb. And Lot II., fed on turnips grown with guano alone, produced an increase of 2318 lb.

Making a difference, in favour of the former, of 220 lb.

Assuming 6-10ths as equal to the dead weight, we have 132 lb., estimated at 5d. per lb., equal to 55s., as the increase in money value on the lot, or an average of 7s. 10¹/₂d. for each beast; and there being 3 acres 2 roods 27 poles of turnips consumed by this lot, the advantage in favour of the dung-grown turnips is equal to about 15s. 7¹/₂d. an acre.

The lot fed on the turnips grown with half dung and half guano hold an intermediate position between the other two lots, and fairly leads to the inference, which they support, that dung-grown turnips have an advantage in feeding qualities over those grown with guano, although that advantage, as shown by this experiment, is not so great as to compensate for the greater cost of dung, and the ready facilities afforded by

guano for growing a much larger extent of turnips on the farm than could be done if farm-yard manure alone were used. Assuming the other expenses of the turnip crop grown with different manures to be equal, the cost for dung in this experiment is, at 5s. per ton, £5 per acre; for guano, £2 per acre; and for half dung half guano, £3 10s.; so that, unless the subsequent crops make up for this difference of cost, a loss of £3 per acre, minus the 15s. 7d. per acre gained in feeding, as shown above, will give the results of growing turnips with dung instead of guano, for feeding cattle. It might have been desirable to have had the dead weight of the animals, and also a test, by chemical analysis or otherwise, of the comparative qualities of the beef for the table; but they were sold to a dealer for a distant market, and these could not be obtained.

Independently of the more direct results brought out by this experiment, there are two collateral points illustrated by the tables worthy of remark. The first is in reference to the effect which the state of the weather has on feeding cattle in open courts. It will be seen that, after the continued wet weather in the beginning of January, a very serious check took place in the progressive increase of weight among all the lots—some of the cattle making little or no progress for nearly a month, and the general increase falling, in Lot I., from 593 to 366, and in Lot II. from 549 to 369. In Lot III. the deficiency is not so marked, but still sufficient to show that, in open-court feeding, there is this disadvantage attending it in wet unsuitable weather, even although the cattle have ample cover under sheds, if they choose to avail themselves of it. The other fact strikingly established by the tables is the great benefit derived from giving cattle even a small allowance of oil-cake along with their turnips. Although, during the last four weeks, only 2 lb. per day were given to each beast, the increase of weight gained by all the lots exceeded that of any of the four previous months—especially that of Lot III., which does not appear to have suffered so severe a check from the weather in the previous month as the other two lots—the highest increase of that lot, before getting the oil-cake, being 522 lb. per month; while, during the month it was given, the increase was 675 lb.

The following table exhibits the weight of the cattle at the commencement and close of the experiment, and their increase in weight during it:—

Lot I.

No.	Weight on Oct. 21.			Weight on Mar. 10.			Increase during the experiment.		
	cwt.	qr.	lb.	cwt.	qr.	lb.	cwt.	qr.	lb.
1 ..	12	3	0	17	1	10	4	2	10
2 ..	10	1	14	13	2	10	3	0	24
3 ..	9	2	21	13	1	1	3	2	8
4 ..	10	0	0	13	1	10	3	1	10
5 ..	10	2	24	13	0	5	2	1	9
6 ..	10	3	25	13	2	13	2	2	16
7 ..	10	3	13	13	3	10	2	3	25
	75	1	13	98	0	3	22	2	18

Lot II.

No.	Weight on Oct. 21.			Weight on Mar. 10.			Increase during the experiment.		
	cwt.	qr.	lb.	cwt.	qr.	lb.	cwt.	qr.	lb.
1 ..	12	3	0	15	3	10	3	0	10
2 ..	12	0	5	15	2	17	3	2	12
3 ..	9	3	0	12	0	12	2	1	12
4 ..	10	1	0	12	3	27	2	2	27
5 ..	10	3	22	13	3	22	3	0	0
6 ..	10	3	7	13	3	10	3	0	3
7 ..	10	2	0	13	1	14	2	3	14
	77	0	6	97	3	0	20	2	22

Lot III.

No.	Weight on Oct. 21.			Weight on Mar. 10.			Increase during the experiment.		
	cwt.	qr.	lb.	cwt.	qr.	lb.	cwt.	qr.	lb.
1 ..	11	0	23	15	1	14	4	0	19
2 ..	11	0	12	14	1	27	3	1	15
3 ..	10	1	23	12	3	20	2	1	25
4 ..	10	1	22	14	0	0	3	2	6
5 ..	10	1	11	12	3	15	2	2	4
6 ..	11	1	0	13	3	8	2	2	8
7 ..	12	1	3	15	1	9	3	0	6
	77	0	10	98	3	9	21	2	27

The cattle were bought, in October, 1850, at £12 5s. a-head, and valued, when put up to feed, at £12 17s. 6d. a-head. They were sold, with the exception of two (No. 3 in Lot II., and No. 3 in Lot III.), on 10th March, for £16 10s. a-head. The two reserved were at that time estimated to be worth £15 a-head. The cattle were sold in slump; but it was considered, both by buyer and seller, that Lot I was worth from 6s. to 8s. a-head more than the other lots—which opinion coincides with the results furnished by the weights already given.—*Transactions Highland Society.*

TITHE COMMUTATION.

SIR,—As your readers may feel anxious to know the result of the Corn Averages for the seven years to Christmas last, published in the "London Gazette" of Friday last, viz.—

Wheat.....6s. 0d. per imperial bushel,
Barley.....3s. 9½d. " "
Oats.....2s. 6¼d. " "

I beg to state for their information, that each £100 of tithe rent-charge will, for the year 1854, amount to £90 19s. 5d., which is a reduction of nearly three-quarters per cent. from last year's value.

The following statement from my "ANNUAL TITHE COMMUTATION TABLES" will show the worth of £100 of tithe rent-charge for each year since the passing of the Tithe Commutation Act, viz. :—

For the year 1837	£98 13 9½
" 1838	97 7 11
" 1839	95 7 9
" 1840	98 15 9½
" 1841	102 12 5½
" 1842	105 8 2¾
" 1843	105 12 2½
" 1844	104 3 5½
" 1845	103 17 11¼
" 1846	102 17 8¾
" 1847	99 18 10¼
" 1848	102 1 0
" 1849	100 3 7¾
" 1850	98 16 10
" 1851	96 11 4¾
" 1852	93 16 11¼
" 1853	91 13 5¾
" 1854	90 19 5

£1788 18 9½

General average for 18 years...£99 7 8½

I am, Sir, your most obedient servant,
CHARLES M. WILlich,
25, Suffolk-street, Pall-mall East,
9th January, 1854.

AMATEUR FARMING.

The following description of amateur farming, with which we have been favoured by a correspondent, will perhaps amuse some of our practical friends, who may be snowed up over their Christmas fire. From our knowledge of the writer, we can guarantee the accuracy of his statements.

I have lately (he says) been spending a few days with my friend Briggs, at his country residence. He is a jolly good fellow, and brother to the Briggs whom Mr. Punch has made so celebrated. He has a capital practice as a solicitor, and combines with his legal practice the agency of several extensive estates. Briggs spends the week in chambers in London, and runs down from Saturday evening till Monday morning to his family, who reside in a snug country house, delightfully situated at the base of the chalk hills, overlooking a beautifully wooded valley of gault and greensand. I will not particularise the locality further than by saying that it is within thirty miles of London, and conveniently situated with respect to a railway station. "You shall see," said Briggs, "a little of my farming; for I hold a hundred acres. I do not hold it for profit, and I do not make much by it; but it is a great amusement to me, and in my position as a manager of landed property, I find it necessary to farm, in order to keep the tenants up to the mark, and to let them see that I know what land can do. Farmers are rather slow coaches, and you would be surprised to find, if you had anything to do with them, how difficult it is to hammer improvement into them."

Our visit to the country on this occasion was from the Friday evening to the Monday morning, because the audit of Lord Fairburn, whose rents Briggs receives, was to be held on the Saturday. We had time, before it commenced, to walk round the farm. He showed me a crop of swedes, which would have been admirable if the fly had not destroyed half of them, and if some other malady had not stunted the growth of the remaining bulbs. He astonished me with the progress made in six months by his short-horn bullocks, and the price which he expected them to realize. He showed me pigs which would have won the prize at the local agricultural show, if the judges had done their duty; "but they are so prejudiced here," he said "in favour of all their Gammonshire breeds, that I have almost determined not to exhibit again." He led me up to my knees in muck, and made me estimate the contents of his stacks, chuckling not a little over the wideness of my random shots. I

saw roots of wurzel of enormous weight, some of which were to be sent up to the office in London, for exhibition to his clients. "They will bring grist to the mill," said Briggs: "I have to thank a large root of wurzel in the office for more than one agency." To do him justice, however, he was very candid, made no attempts to conceal his failures, and bestowed many hearty maledictions on his bailiff for having deviated from the instructions which had been given him as to the way in which sundry operations in husbandry were to be conducted. "This is too bad," he exclaimed, "I am always finding fault with the tenantry for their slovenly ways, and here is the very same thing on my own farm. I shall be sure to have this thrown in my teeth at the audit. It would be different if I could be more in the country." When anything goes wrong in amateur farming, it is always the bailiff that is to blame; just as the cat breaks everything in the pantry, and just as a gentleman never throws his horse down, which the groom is so apt to do.

I accompanied Briggs to the audit dinner, which went off admirably. The landlady of the Fairburn Arms is renowned through the county for her cookery. She had put forth her utmost culinary powers on the occasion, and mine host had gone to his best bins for the wines.

Briggs was in tip-top spirits. The rents had all been paid without a single defaulter, and with not more than the usual amount of complaints of the season, the crops, and the prices; for on such occasions it is always the rule, that

One talks of mildew and of frost,
And one of storms, of hail;
And one of pigs that he has lost,
By maggots at the tail.

I need scarcely say that the speeches were of the first order. The toasts of "The Queen," "The Prince Consort, the prince of farmers," "The Prince of Wales and the rest of the Royal Family," were received as they always are received in an assembly of British farmers. Then followed Lord Fairburn, Lady Fairburn, and every member of the house of Fairburn, each with three times three and with one cheer more. We drank "Speed the plough," "Live and let live," "Breeding in all its branches," "A fine fleece on a fat carcass," together with the usual round of agricultural toasts; and in the speeches which accompanied them, the British lion occasionally showed his honest face, but by no means too prominently or exclusively. Briggs gave the "Tenantry of the estate," whom he eulogised

as the best tenantry under the sun, and the best farmers in England; although, as he remarked in a humorous speech, to which it would be out of my power to do justice, there were some points on which he and they were not agreed, and some parts of his practice which they did not follow quite so rapidly as he could wish. He should see them, however, converts yet to deep drains at wide intervals, laid with the fall, instead of across it; and he had no doubt that in time they would discern the advantages of deep ploughing, and the superiority of Downs over Leicesters, or of Leicesters over Downs, I forget which. One of the tenantry then proposed the health of Mr. Briggs, the excellent steward of the Fairburn estate, who understood so well the live-and-let-live principle. The interests of landlord and tenant were the same, if they did but know it. The lower the rents, the more punctually would they be paid, and the more the land would be improved. It would be well for farmers and landlords if all agents understood this so well as Mr. Briggs. "If they all do as you do," he added, emphatically, "they would not do as they do so." He then proved to demonstration, amidst tremendous cheers, that the present prices, high as they are, are scarcely remunerative. He parried, good-humouredly, the good-humoured attacks which Briggs had made on the favourite stock and the favourite mode of draining among the practical men of that district, who, having been bred on the land, must best know how to treat it, and the stock best suited to it. I need scarcely say that he sat down amidst thunders of applause. Briggs returned thanks in a speech which must be considered the speech of the evening. "With such a landlord as Lord Fairburn," he said, "and such a tenantry as his friends around him, his task was an easy one." He complimented the tenantry on

the improved agricultural prospects before them, and on the punctuality of their payments; an audit without a single defaulter was a phenomenon which few estates could boast. He was determined to mark his sense of it by topping the party up with a bottle of claret each—whether at my Lord's expense or his own, I did not distinctly understand, for, to say the truth, his utterance had become by this time rather thick: I suppose it was in consequence of so much speech-making. I am certain, however, that whoever shall find the claret, it must tell on the punctuality of the next audit. When the cheers and Kentish fire had ceased, on his resuming his seat, a farmer who sat next to me, and who was beginning to grow confidential, observed: "Nice gentleman Mr. Briggs—a regular brick, and a capital lawyer; but he don't know much about land, and, like all these agents, leans rather too much to the landlord." "His example farm," I remarked, "must be a great advantage to the tenantry—it must give you an early knowledge of the most recent improvements of the day, together with an opportunity of seeing them reduced to practice before you adopt them yourselves." "You may well call it example farm," he replied, "for he shows us a power of examples of what we ought *not* to follow. He will never make his fortune by farming. His best farm is in Lincoln's Inn Fields; but he is a nice gentleman for all that."

Such was the influence on the Fairburn tenantry of the farming which Briggs found necessary, in order to keep them up to the mark, and to let them see what land can do. Our correspondent then narrates its success as an amusement, how it affected his domestic comforts, and what Mrs. Briggs thought of it. On this part of the subject, however, we cannot enter at present: we may perhaps revert to it at a future opportunity.

ON THOROUGH OR SUBSOIL DRAINAGE AS APPLIED TO DEAD-LEVEL DISTRICTS.

"Thorough draining is the foundation of all good husbandry."—SMITH, of Deanston.

This is the season when most farmers attend to improvements in their drainage, and is the time when all such works may with the greatest facility and safety be executed.

Having had considerable experience in subsoil draining on a *dead level*, I have chosen this subject as being applicable to the season; and as this kingdom contains such a great extent of *low, flat lands, or dead levels*, it renders it a very important topic on which to offer a few observations, and more particu-

larly when I unhesitatingly assert that nearly every flat or dead-level district can be effectively drained by judicious subsoil drainage.

The question is one of great interest and consequence, if we glance at the extent of these districts—I might almost say counties, they are so extensive. I will enumerate those best known in England; and I believe the figures will be found to be very nearly correct, though some are by estimate.

The great level of the fens is the most extensive, and contains about	650,000 acres.
The Somersetshire fens and marshes come next, and contain about ..	130,000 "
The Isle of Axholme, Ancholme flat (Lincolnshire), and Hatfield chase (Yorkshire)	140,000 "
The Lincolnshire marshes, bounding the county on the east	100,000 "
The Holderness or East Yorkshire district	45,000 "
The East Norfolk and Suffolk, near Yarmouth	55,000 "
The Essex marshes and islands	40,000 "
The Kent and Thames marshes	25,000 "
The Romney marsh	60,000 "
The various districts in Lancashire ..	20,000 "
	<hr/>
	1,295,000 "

Thus we have an area of upwards of one million and a-quarter of acres of level land in these counties alone, besides many smaller tracts, which probably would augment the total number of acres to two millions; and these lands I fearlessly assert may be effectively subsoil-drained. This is fully and most satisfactorily proved in every part of the great level of the fens: many farms in the very midst of these fens are subsoil-drained, and the system is widely extending. The great fact is, that wherever an outfall can be kept lower than the surface soil, either by natural or artificial means, draining by thorough-drainage may be safely effected; indeed, this mode of drainage may be relied upon, even where the water in the drains forming the outfalls is higher, or covers the mouth of the subsoil drains, and apparently flowing into them—the subsoil drains will be found to utter their waters notwithstanding, as seen by the bubbling of the water at the mouth of every drain. I am, of course, supposing each district to possess an efficient system of surface drainage; for, in this age of progress, it is altogether unpardonable to be without it, as it is so easy of attainment either by natural or artificial means, as just named. It is no uncommon practice, in these fens, to erect small engines, for draining small plots not exceeding six or eight acres: they cost about £16 each.

Materials for Draining.—This must depend mainly upon the nature of the subsoil. In the fens where the clay can be readily reached, it is customary to use draining tiles or pipes. These are laid in the bed of clay so as to prevent as far as possible the sediment from the turf or moor forming a deposit within the drain. Occasionally, and with good effect, dry turf is used: it is put in the form of a wedge or triangle, with the base downwards, near to the bottom of the drain, so as to leave a triangular orifice beneath: it hardens, expands, and is permanent. On porous soils, or such soils as are likely to deposit a sediment, thorns are the best medium of drainage,

and they have this advantage—the drains may be made wider apart; the water from the porosity of the soil will find its way to them. They will require renewing every ten years at furthest; but, as many old drains will still be effective, the drainage is then surprisingly good, and also unquestionably cheap. On grass lands with clay subsoil the wedge or sod drainage is both cheap and effective; perhaps the very best system yet adopted on grass lands of porous character;—thorns overlaid by a wedge sod is exceedingly good, and very cheap. In subsoil draining grass lands, all expensive materials may be dispensed with, on a dead level; for, what with the treading of stock, the compression of the soil from various causes, and deposit of sediment, these drains will often require renewing.

Laying out the Drains.—It must be borne in mind that we are draining a *dead level*: we have no declivity, no incline down which the water can pour; consequently, all the drains very gradually empty themselves by such slow degrees as the outfalls permit. Therefore, in laying out a field for drainage, due regard must be had to secure the nearest and readiest way to the main outfall drains. These are generally ditches cut for field fences in most flat districts. Much, also, will depend upon the shape of the field; if it is of irregular form, it may be as well to follow the sinuous course of the hollows, with branches here and there as required; but, as a general rule, the drainer should endeavour to throw the field into squares or parallelograms, so as to have the drains corresponding either in parallel lines or squares. In laying out an oblong field, let all the lines be parallel, but occasionally intersected by transverse drains, so as to prevent obstructions from the stoppage of any parallel drain. For instance, an oblong field may be about twenty chains in length by ten in breadth: the parallel lines should be across the breadth of the field, with two or three main lines intersecting through the length of the field. This, however, must depend much upon the nature of the main outfall drains; for, generally, to find the nearest way to them is the best practice, and which the drainer's judgment will readily suggest to him as he proceeds. Every drain should, if possible, be made to empty itself into some main outfall, or effective drain, so that the waters may be more quickly passed away.

Modes of Draining.—To describe the modes of operation in draining, in these improving days, seems unnecessary, as they are so common, and of daily construction. The party of drainers consists of four men and a lad. The lines being set out, the usual course on the dead-level lands is this:—The first man takes out the first spit or draw, as perpendicularly as possible, and about ten inches in width; the second man takes out the next draw or spit, keeping the

drain as upright as possible—this prevents treading in; the third man has the taper or draining spade, with which he takes out another spit, so as to leave a narrow bottom, which he cleans out with the draining scoop; the fourth man puts in the material, *i. e.*, thorns, or tiles, or pipes, &c.; the lad assists generally in filling in, fetching and laying conveniently the materials to be used, &c. The drain thus formed should be about thirty-two inches in depth, and well trodden down. If thorns are used, the work may be completed as it proceeds; but, if tiles or pipes, it is desirable to leave the whole line open till it is completed, so that any displacement of tile or pipe may be rectified, and also to

ascertain the uniformity in depth, which in general is established by the flow of water after the workmen. Then sprinkle a slight layer of straw, stable, or similar material on them, and cover down with soil carefully, so as to keep all parts correct and in place, to be completed by renewed treading. It certainly does appear slovenly and out of keeping with a well-regulated farm to see large hedges surrounding the fields; but I believe for purposes of drainage on porous soils, a good crop of white or black thorn hedges is a valuable acquisition, providing they are kept well-sided up, which also improves the growth of the wood, and makes it straight and proper for use in subsoil draining.

ON THE DISCUSSION OF POLITICAL QUESTIONS AT OUR PUBLIC MEETINGS.

It is only a few years since that agricultural meetings were very distinctly classified under two separate heads. At one the speakers were assumed to talk nothing but practice; at the other, they were expected as religiously to adhere to politics. There is no question, either, but that for a season the latter of these two themes had by far the best of it. The mere business of farming furnished but small attractions when compared with the more exciting scenes and eloquent displays provided elsewhere. It was difficult, indeed, to keep the practical to practice; and many an unfortunate orator was brought up short to "order" in the midst of his happiest period, or when approaching his grandest climax. Had he but been in "another place," no language would have been too strong, and no encouragement too great. It is but little wonder then that the utilitarians languished, while crowded meetings and hearty plaudits greeted those who, with no such limit to their energies, came prepared to "speak out."

We have lost at length the cause of this distinction, though the empty title still remains with us. If generally too delicate to attempt to define it, every man knew well enough what, with the agricultural world, this "Politics" or "No Politics" really meant. It was simply Protection or Free-trade. When a farmer wished to hear these discussed, he went to a Protectionist meeting. If he ventured to introduce them at any other, he was at once, and very properly, put down. We must repeat that the necessity for this classification is gone, while it is to the interest of all to forget that it ever existed. Any weak-minded Wronghead now venture to refer to "obsolete opinions" or "the old face" of so-and-so, fortune will favour him if he be not something more than silenced. We ex-

pect to hear and consider something better than the revival of exploded bickerings, or the triumph of self-glorious inanities.

The name, however, yet remains. The English farmer is still haunted with a word. He is like the unhappy Exquisite, who, if he had a dread of anything, it was that horrible term, "*genteel*." He shuddered as he was pressed to visit people, because they were so very "*genteel*;" flew from the presence of the damsel who was recommended to him as so really "*genteel*;" and sunk at last into hopeless despair on accidentally hearing himself characterized as "*quite a genteel young man*." So it is with the agriculturist. If there is a word that by this he ought to ignore, it is that one—politics. He ought, perhaps, once to have talked politics more than he did, or he ought never to have talked politics at all. At last, though, the point is settled; and he need not trouble himself with them any further. He may enter a room now, without the cry of "*Politics*" at once forcing him to rush out of it. He may offer his opinion on what he thinks concerns his own position, without "*Politics*" sternly assuring him how much he has offended. He has rubbed that *genteel* word out of his vocabulary—at least so he flatters himself. Terrible delusion! No sooner has he slain the parent monster, than it rises again, hydra-headed, before him. Points that in the bitterest times were harmless enough, are fearfully political now; and shall he discuss politics, or shall he leave them alone, is more than ever the momentous question for his consideration?

This was illustrated amusingly enough a few weeks since, at a discussion of the London Farmers' Club. The members were debating as to their future proceedings, and so of course on came the

grand point again—Should they discuss political subjects, or should they not? Many of the speakers, were decidedly of opinion that they should; that they could do little good if they did not touch on subjects that really affected their own interest. One gentleman was especially vehement in the expression of his desire that they should do so, and that, above all, that they should discuss the Malt-tax, and its many concomitant evils. There was some little consideration over this, the majority being clearly of opinion that a farmers' club might venture to grapple with an evil that so immediately interfered with a farmer's pursuits. Fortunately, however, there was no occasion for proceeding to a division, for at this period it came out that the Farmers' Club had discussed the Malt-tax over and over again! When the "No Politics" prohibition was most strictly and most prudently enforced, Liberals and Conservatives had joined heart and hand to denounce that unjust and altogether inconsistent infliction, the Malt-tax. If politics was no bar then, surely it is hardly worth while to stay to consider if it be so now.

We subjoin a letter on this subject, from our correspondent, W. B. In a note to this, it will be observed, he, too, refers to the Farmers' Club, and more particularly to the themes selected for this year's discussion. Three of these he classes as political. We really are in some doubt as to which *three* he points to; but we may safely take "The Corn Averages" and "Agricultural Statistics" as two of them. The third rests between "The Labourers' Friend Societies" and "The Letting and Hiring of Land." It would seem, then, that the Club has manfully resolved on encountering these political topics. If so, they need be under little anxiety as to the determination arrived at, for it is by no means an untried path they are pursuing. More than seven long years since, they first discussed the importance of establishing an accurate system of agricultural statistics; and but a few seasons following, the evils resulting from the imperfect mode of taking the corn averages. The condition of the labourer has been quite as long before them, while the Club gained some especial celebrity by its advocacy of the tenant-right principle in the hiring and letting of land, just when the "No politics" rule was in the acme of its authority.

In a word, these and such other subjects were not then considered to be embraced in that somewhat Delphic phrase—*political*. Why should they be so now? Our own belief is, that we have no word more unpalatable to the tenant, or less likely to be of service in any dealings between him and others, than this same "politics." Let him then altogether ignore it. The time is come when he may

freely and honestly discuss those matters which affect him, without the dread of any such phantom "bogy's" interference. It is evident that we should have to draw some very nice distinctions between what is and what is not political. Our correspondent, after a very elaborate consideration of this, comes pretty much to the conclusion that the English farmer may now discuss any point which he considers really bears on his own path in life. Without agreeing, perhaps, with all advanced, we can very cordially with this satisfactory result to his deliberations. We trust ever to see topics that may be thus introduced, deliberated over with temper and courtesy; while we anticipate more union of strength than difference of opinion as the characteristics of such meetings.

The political economy and cultivation of land are, unquestionably, both comprehended in agricultural science; and therefore if it is true that science and practice ought to go "hand-in-glove together" when speaking of the whole, it follows as an axiom that they ought also to go together in the two parts or branches; consequently, farmers ought to learn and carry out the science and practice of the political economy of land, as well as of its mere culture. At public and private meetings they ought to speak with the same coolness and freedom on the former as they do and act on the farm when reducing its propositions to practice. Either such is the case, or we circumscribe to science a very limited circle.

Some say, "No!" As Rome said of "Wickliffe's Bible," so say they of "farmers' politics"—*Dangerous!* But Luther thought otherwise; and Englishmen now read the blessed book without public disturbance or commotion—practising the infallible doctrines it inculcates, no one saying it is wrong they are doing. Intellect has triumphed over all the prejudices of superstitious times as regards the Bible, and, with a little longer of the schoolmaster abroad, will, we hope, do so in the case of the political economy of land.

"Sectarianism," it has been said, by way of objection, "prevails in the religious world, and would do so among farmers were they to discuss political questions at their public and private meetings. If they confine themselves to the cultivation and manuring of the soil, with the rearing and feeding of live stock, harmony will prevail and usefulness result; but the moment they enter the political world, they split into parties, flaring against each other like so many firebrands."

Granted. But what does the argument involved amount to? Simply this: that there is such a personage in politics, so to speak, as the "Scarlet Lady"—the Emperor of Russia, for instance, who is now grasping to subjugate Europe and Asia to his tyrannical yoke. If he succeeds in his ambitious enterprise, there cannot be a doubt but his Cossack lance will make his unfortunate subjects think one way in politics and religion. We hope, however, that better things are in store for the East, where civil and religious information have been making so great progress of late. As for England, it

would be absurd to dream of measuring her farmers' corn by the Muscovite's bushel; for intellect has triumphed, and must continue to progress. To suppose that farmers will never learn to discuss political topics for their mutual advantage at public meetings, is but an indirect way of stating the startling conclusion that they are a hot-headed race of blockheads—the slaves of arbitrary despotism; than which nothing can be further from our national character and the facts of the case, as the experience of every past age has amply confirmed, and as the future, we have no doubt, will continue to do. Progress is ever the most distinguishing feature of the English character, the honest farmer not excepted. Every corner of the world proves this. Compare Anglican America, for instance, with the Spanish or Portuguese; our Australian and African empires with those of China, Japan, and native Africa; and facts speak for themselves. In contemplating the wonderful diffusion of our race—principally drafted from our rural population, too—that feature which most prominently distinguishes them in every climate of the habitable globe; that which has been universally attributed to them, and proverbially acknowledged by themselves as the mainspring of all their actions, is their “go-a-head” character, unfettered by fears or prejudices of every kind. Now, if Englishmen can discuss with so much freedom and advantage political topics of every kind in any corner of the world, is it possible to avoid doing so in the land of their forefathers much longer? In point of fact, three-fourths of all the subjects discussed in the columns of the agricultural press, or at our public and private meetings, are less or more mixed with politics, while the remainder is almost wholly political, as we very soon shall see; so that the argument involved has not a foot to stand upon, save despotism and prejudice.

Although the above comparison between religious and political sectarianism has been often made, it is by no means a fair one, at least in the sense in which it is generally conveyed; for those who make it, do so as if it were an evil in the former case, and by sequence must be so in the latter. But those who argue thus, take a very imperfect and worldly view of religion; for spiritually it is sectarianism which has kept the Church alive (Lutherism and Calvinism for instance); so that the legitimate conclusion is directly the opposite from the above.

That political division will do good among farmers is a proposition, however, which may require proof; but the solution is simple the moment we commence to handle the facts of the case; for when we look abroad upon our provinces, so diversified in soil, situation, and circumstance, and behold the universality of practice which prevails, *we at once see that division is absolutely very much wanted.* There, for example, thousands of farmers are following antiquated customs for no other reason than that their forefathers did so before them, as if bound by some peculiar political spell—the spirit of the district as it were. Now, until this spell is broken, and the minds of farmers set free, progress can hardly be expected; for, until this is done, they will just do as they have done; but the moment we get them divided, they then start off with new ideas, each acting independently for

himself, according to circumstances; superstitious notions giving way to the physical laws of nature, and the political economy and culture of land becoming based upon established principles, on which division afterwards is impossible. Nay, more than this; for division will not only be not avoided in a bad sense, but courted in a good, so to speak; for members of clubs and public or private associations will express themselves disappointed when subjects before them are not warmly debated. To try the soundness of arguments involved, for instance, the most talented among them will even be placed upon the opposite side of the question, and no stone left unturned until every new project is thoroughly sifted, and every flaw in it fairly exposed. Oral controversy will not be enough; for every proposition of novelty will be called to the bar of practice, and the different experiments discussed afresh, until the affair is fairly settled upon a solid foundation. Now these are conclusions not strung together purposely to fill up a column of a newspaper, but are an epitome of the working of an agricultural club, which we shall briefly notice. What we have just said is sufficient to prove that *no harm can follow divisions among farmers in the discussion of questions which have to be settled at the bar of practice ultimately, but, on the contrary, much good.*

The public discussion of agricultural topics by farmers, for the purpose of advancing science whenever they meet together, as at our annual show dinners and special meetings of clubs expressly for the purpose, is one of the most important movements of the age. To do so advantageously, no doubt requires a little experience; but this can be had. The familiar old maxim, “that an apprentice fee has to be paid” in this department, as well as in every other, must not be forgotten by them. In illustration of this, we shall now notice the case of the farmers' club already referred to, which consisted of twelve members. These have a monthly meeting at a member's house, where a plain dinner is prepared in conformity to previously agreed-upon regulations; so that each member has one during the twelve months, he himself being, of course, chairman on the occasion. After dinner, some topic, announced at the previous meeting, is discussed. At the commencement they were rather awkward, and high words were even exchanged, some members expressing themselves very hastily, and others taking it in high dudgeon; but before twelve months were over, it was very different, parties becoming more cool and collected, besides better informed, so much so that it was no joke to go into controversy with them. Opinionative arguments were soon thrown aside, and science brought to bear upon all practical topics; so that the object of the club was realized in the highest degree, the progress made being far greater than expected, exemplifying itself very conspicuously in the case of their farms, as well as themselves. Now, what is true of this club would just be true of all others, if properly organized. In a few years, topics would be discussed with a dignity, candour, and impartiality worthy of the highest courts of the realm. At the present season how many afternoons and long evenings are spent by Christmas parties in scenes which are

a disgrace to the country, instead of a blessing! Hence the propriety of a change, as in the case of the above club, who converted their Christmas dinners of excessive eating and drinking into useful monthly meetings for the progress of agricultural science. A similar improvement would be made were discussions of this kind to supersede the irrational system of drinking toasts to excess at all our public dinners. For many years past, the public mind, especially of the agricultural body, has been approaching nearer and nearer to this conclusion, so that the result is obvious. It is yearly becoming more warmly advocated, for instance, by those who already are pioneering in the work, serving, as it were, their apprenticeships; so that all that is wanted is the organization of farmers, and their learning to discuss coolly and collectedly the different topics on the roll, in harmony with the laws of physical science, which they would soon do, when our proposition—a practical one—would be generally realized.

All our societies and clubs already discuss political questions—the Royal Agricultural Society of England scarcely excepted; so that the proposition of excluding such can only be one of degree, or, for a time, having reference to some peculiar topics. The soundness of this proposition will readily be appreciated when we mention, that the topics of *subdivision of labour, capital invested in agriculture, rent, wages, the price of things, book-keeping, the management of labourers, poor rates, &c., &c., &c.*, all belong to political economy or farmers' politics, and hence would have to be excluded. Now, which of all our societies is it that does not discuss, less or more, each and all of those subjects; or, which of them is it that they should not discuss? The answer is obvious.* And when we contemplate for a little the comprehensive character of some of them—as labour, capital, and the price of things, and the various combinations which they give rise to—it will readily be found that they involve no fractional part of our political economy. If, therefore, they are to discuss all topics connected with the political economy of land, under what circumstances are any of them to become the exception, and be excluded? The only answer which can be given to such a question is this, that offence might be given to some who ought not to be offended (?) were some particular topics discussed. But this very fact is of itself the strongest reason that the public discussion of those very topics is the most loudly and imperatively demanded, in order that everything calculated to offend should be fairly and openly dealt with, and every obstacle thrown out of the way of progressive science. We might here suppose a case, viz., that *tenant right* is an exception which would offend many landlords, preventing them from joining any society where such topics are discussed. But plausible as such a hypothesis may appear when superficially examined, we have only to take up the facts of the case, when it ceases to have existence; for landlords as a body are a match as yet for

farmers in public discussion, and would have little difficulty in preserving the mutual interests of parties in the tenant-right question, or the investment of capital in land, when scientifically expressed. The majority of them are as anxious now to have it fairly settled as farmers, and this is certainly moving in the right direction. Their labours in Parliament bear ample evidence to this, so that the hypothesis is uncharitably applied to them; for they are not in the way of progress here. We are not to be understood, however, to say that there are not very many landlords too arbitrary and domineering in their bearing towards farmers as a body, who would not join societies which did not in some measure countenance their limited and imperfect idea of things; but the number of those is annually becoming beautifully less, for landlords are everywhere acquiring a more perfect knowledge of the science and practice of agriculture in all their branches, paying much more attention to both than they formerly did. The good which the Royal Agricultural Societies of England and Ireland, with the Highland Society of Scotland, have done here is incalculable; and there cannot be a doubt but they will ultimately succeed, and that at no distant date, in dissipating all our patriarchal prejudices of an exclusive character, and discuss agricultural topics of every kind indiscriminately and harmoniously, without offending either landlord or tenant; for science can offend none, but edify all.

The practical question, in all matters of political controversy for mutual edification, is to put the topics in a proper shape for discussion, and then to adhere to the facts of the case. No doubt many of the former have received an education little inferior to that of the latter, while they have a more thorough knowledge of practice, and therefore are just as able to frame proper regulations and abide by them, if not better: but when we look at the whole collectively, and weigh everything, we are driven to the conclusion that the well-informed will have to act the schoolmaster for a little, in order to afford their less fortunate brethren an opportunity of acquiring the necessary information. After they have learned to exclude self-opinionative matter, and to adhere closely to a scientific view of the subject, it would be absurd to suppose that landlords would either be offended or deny themselves the benefits which public discussions of the kind would afford. Instead of this, we venture to hope that many of them would be amongst the most active and attentive, if not the most useful, members. Now the object of such discussions being the diffusion and progress of science it consequently follows that they should be shaped and handled accordingly. In other words, the great aim is to teach farmers how to manage their affairs according to scientific data, and not opinionative. The diffusion of knowledge and concentration of opinions are two very different things. The latter is that rock on which almost our all clubs have been shipwrecked, and therefore cannot be too cautiously avoided; while the dissemination of a more perfect knowledge of the political economy of land among landlords and tenants would be conferring upon them blessings which neither are probably prepared at present fully to estimate.

The sum and substance of the whole matter is this, that

* Since writing the above we have seen the six articles for discussion by the London Farmers' Club this year, three of which are political, and three purely agricultural; and we have no doubt the former will prove as edifying as the latter.

hitherto we have only met our landlords by the cover side and at the hustings, the former taking the initiative as it were. But old things have passed away, and such meetings are no longer sufficient. A landlord once took our opinion as to the stubbing-up of an old *fox cover*; and, when going over the ground, expressed his apprehensions that the changes so fast taking place would "do away with that fine feeling which had so long existed between us and our tenantry." "Nothing of the kind," was our reply; "let us meet together, and discuss the various topics of agricultural science involved in the improvement of our

country." "Ah, yes," said he, smiling, "that is what we want; but how are we to proceed? Answer practically." We did so; giving the substance of the foregoing, with the addition of agricultural colleges and schools for landlords' and tenants' sons, and libraries for old folks beyond the reach of schools. In short, let us learn to discuss the political economy of land properly at our clubs and private meetings, and then we shall be able to meet our friends on the hustings and our opponents in Parliament successfully.

W. B.

APPROACHING REVOLUTION IN AGRICULTURE.

Among the new lights which have of late broken in upon the minds of those who lead the van in the science of agriculture, there is none more interesting than that which seems to foreshow the possibility of producing crops without manure. To make *Dave Nature* yield up her bounties with but little artificial assistance has long been among the dreams of philosophers; and now we have indications that the dreams are to give place to realities. No result could be more opportune if, as some political economists assert, agriculture affords far greater means and resources for the well-being of a population than trade, especially when made use of in reformatory purposes. The fact, they say, would have been demonstrated long ago if agriculture had only had fair play. Well, it has now got fair play, and is finding energy for improvements and experiments which are gradually leading to a solution of great questions, and to results very different from those imagined by theorists. Let us take a brief survey of the investigations; it is something more than mere dry reading.

Everybody knows that there are fifty-five or fifty-six elements which make up the mineral world, and only four of which are concerned in the vegetable world—namely, hydrogen, oxygen, carbon, and nitrogen or azote. If we knew precisely when, where, and how plants obtain their supply of these elements, our theory of agriculture would be complete, and there would remain only the pleasure and profit of reducing it to practice. But we are as yet on the threshold only of the required knowledge. What we do know from recent experiments is, that plants do absorb azote, and largely, from the atmosphere. Priestley said so many years ago: his conclusions, however, were disputed and rejected. As it happens, the productions which yield food to man and fodder to cattle most abundantly are those which come more especially under consideration. Farmers alternate root crops with grain crops, with a view to prevent exhaustion; but this exhaustion, as late experience demonstrates, is best prevented by offering all possible facilities for a free and full supply of nitrogen, and from the atmosphere rather than from other sources. Water and air, indeed, play a more important part in agriculture than many who till the soil by mere routine would be willing to believe. M. Bandrimont, professor of chemistry at the Faculty of Sciences at Bordeaux, has just published a work, 'On the Existence of interstitial Currents in Arable Soil, and the influence which they exert on Agriculture,' in which, after a long study of the subject, he states that there is a natural process at work by which liquid currents rise to the surface from a certain depth in the ground, and thus bring up materials that help either to maintain its fertility or to modify its character. Many phenomena of agriculture and of vegetation

have at different times been observed, which, hitherto inexplicable, are readily explained on this theory. Such, for example, the improvements which take place in fallows; and there is reason to believe that these currents materially influence the rotation of crops.

In Germany, Schleiden is attracting much attention by his masterly views on the phenomena of vegetation; and it will surprise many to hear that he admits of no relation between the fertility of a soil and the quantity of fertilizing matters expended upon it. "The goodness of the soil," he says, "depends upon its inorganic constituents, so far at least as they are soluble in water, or through continued action of carbonic acid; and the more abundant and various these solutions, the more fruitful is the ground." Arguing from this view, it is not richness of soil or humus that produces the multiplied varieties of Alpine plants in Germany, or the absence of it that produces but few. "Soluble mineral constituents" are shown to be the characteristic of our cultivated fields; and "an agricultural plant" is defined as one "distinguished from wild individuals of the same species by peculiar qualities which constitute its fitness for culture, and which depend upon a modification of chemical action." The amazing yield of Indian corn in Mexico—from 200 to 600 fold—is something which, with all our skill, we cannot accomplish, and is a fact in favour of the argument, "that in no case do the organic substances contained in the ground perform any direct part in the nutrition of plants." The annual destruction of organic matter all over the earth is estimated at 145 billions of pounds, equal to 2½ billions of cubic feet; and if all vegetation depends on organic matter for nutrition, to satisfy this consumption, "there must have been, 5,000 years back, ten feet deep of pure organic substance on its surface." Another illustration is furnished by taking the number of cattle and other animals in France in a given year (1844), and observing the amount of food they consume. The process of nutrition would require 76,789,000,000 pounds of organic matter—six times more than the whole number contribute of organic matter towards reproduction, and in 100 years "the whole organic material of the country would be consumed."

Again: look at a farm. How much more is carried off from it than is given back again: generally the amount of its yield is three times greater than that of the organic matter it receives; while of the manure applied, the greater part is not taken up, but imperceptibly decomposed. Carbon is the most important of the constituents of plants: an acre of sugar-plantation produces 7,500 pounds of canes, of which 1,200 lbs. are carbon; and yet sugar-plantations are rarely manured, and then only with the ashes of the burnt canes. With bananas

the result is still more striking: the yield is 98,000 pounds of fruit in a year from a single acre, and of this 17,000 pounds—more than a fifth—is carbon; and the same acre will give the same return year after year for twenty or thirty years; and the ground at the end of that time will be richer than at the commencement, from nothing more than the decay of the large leaves of the plants. Here, in Europe, too, the difference in weight and in carbon between the seed and the produce has often been noted—in wheat, 89 per cent.; in red clover, 153 per cent.; and in peas, 361 per cent. These facts afford evidence of a supply of carbon derived from other sources than those commonly supposed to exist; and while we know that seeds will germinate and become vigorous plants in pure quartzose sand, or in cotton wool, or on a board, we seem to have proof that the chief source of supply is the atmosphere. This is an interesting point, which further research will verify: Schleiden shows the process to be eminently simple. He says in his work, of which a translation has been published by the Horticultural Society: "According to Link, Schwartz, and others, an acre of water-meadow produces 4,400 pounds of hay, which, when dry, contains 458 per cent. of carbon. The hay then yields 2,000 pounds of carbon, to which 1,000 pounds may be added for the portion of the year in which the grass is not cut, and the roots. To produce these 3,000 pounds of carbon, 10,980 pounds of carbonic acid are requisite, which may be raised to 12,000 pounds, to compensate for the nightly expiration. Now, Schubler has shown that an acre of so wretched a grass as *Poa annua* exhales in 120 days (too low a computation) of active vegetation 6,000,000 pounds of water. To supply the exigencies of the plants, therefore, it is only necessary for the meadow to imbibe $3\frac{1}{2}$ grains of carbonic acid with every pound of water."

Mr. Lawes has found, also, that in a plant of any one of our ordinary crops, more than 200 grains of water must pass through it, for a single grain of solid substance to accumulate within it. He states the evaporation from an acre of wheat during the period of its growth to be 114,860 gallons, or 73,510,000 gallons per square mile. With clover, it is rather more; with peas and barley, less. When we apply these calculations to a county or a kingdom, we are lost in the magnitude of the processes by which nature works; but we see the more clearly that, on such a scale, the quantity of material applied by the air, though minute to the individual, becomes vast in the aggregate. We see, moreover, the necessity for understanding the relations between evaporation and rate of growth, and the laws and effects of absorption in soils. A thousand pounds of dry calcareous sand will gain two pounds in weight in twelve hours when the air is moist, while pure agricultural clay will gain thirty-seven pounds.

The source of nitrogen comes next to be considered; and this also is seen to be independent of manures. Hereupon, it is observed that "our domestic plants do not require a greater supply than in a state of nature. A water-meadow which has never received any dung, yields yearly from forty to fifty pounds of nitrogen, while the best ploughed land yields only about thirty-one pounds. The plants for which most dung is used, as potatoes and turnips, are in fact proportionally the poorest in nitrate." That there is a supply independent of the soil, is further seen in the millions of hides furnished every year by the cattle of the Pampas without any diminution of produce, and in the great quantities of nitrogenous matters, hay, butter and cheese, carried off from pasture land; far more than is returned by the animals fed thereon. Experiments with various kinds of plants on various soils have satisfactorily demonstrated that increase of nitrogen in the

land and in the crop does take place quite irrespective of supplies of manure.

With respect to ammonia, "it appears that one-thirtieth of a grain in every pound of water is sufficient for the exigencies of vegetation, and there is perhaps no spring-water in the universe which contains so little." Then as to sulphur and phosphorus, which are also among the constituents of plants, the quantity needed in proportion to the time of vegetation is so small, that one-520,000th of a grain of sulphuretted hydrogen per cubic foot diffused through the atmosphere to a height of 3,000 feet is all that is required.

The consideration that cereals would soon disappear from the north of Europe, if not cultivated, and perhaps from nearly the whole of this quarter of the globe, adds weight to the arguments in favour of enlightened attention to the inorganic constituents of plants. The point is to bring the soil into harmony with the conditions by which growth may best be promoted. Much depends on the nature of the soil; the darkest coloured lands are generally the highest in temperature; hence the advantage of vegetable mould; while deep-light sands, and clay, which turns almost to stone in dry weather, weary and vex the cultivator by their unprofitableness. It is to be remembered, however, that soils which have the highest temperature of their own, may not be those most susceptible of receiving heat—that is, from the sun, because some lands are warmed by the springs that irrigate them. Here we have an explanation of the phenomena of certain soils which are warm in winter and cool in summer. The application of humus evolves heat by the process of combustion; and sand, lime, clay, and humus are the combinations needed, the clay being in a proportion of from 40 to 50 per cent.; if less than 10 per cent., the land will be too light and poor.

Although Schleiden's views apply chiefly to the practice of German agriculturists, they will be found to bear on the whole science of cultivation. In summing up, he insists strongly on the necessity for selecting good seed; that from a barren soil, he observes, is likely to be more true to its kind than from well-manured land. Also, that the time of sowing should be adapted to the requirements of the plant; rye and barley, for instance, should be sown in drier weather than oats. And it will surprise many to read, that he advocates a less frequent use of the plough. He holds ploughing to be, "a necessary evil, one to be employed only so far as necessity requires;" because, by the too frequent loosening of the soil, the decomposition of humus is so rapid as to overbalance the benefit supposed to arise from exposure to the atmosphere. He shows, too, that covered fallows are in most cases preferable to naked fallows, as the latter tend to waste the valuable qualities of the soil; while, in a field sown with clover, the quantity of humus and carbonic acid is increased by the leaves preventing evaporation. Naked fallowing is to be adopted only when the soil cannot be loosened in any other way; but there is to be no stand-still: "the notion of rest, so prevalent among cultivators, is clearly wrong, except it be rest from the destructive influence of the plough;" and always must it be borne in mind, "that manures do not act immediately on vegetation by means of their organic contents, but by reason of the inorganic substances which they evolve."

Such is a brief outline of some of the views of one who holds a high position among men of science; and though in some particulars they may seem to be at variance with practice in this country, there is much in them worthy the attention of intelligent cultivators. It is remarkable how different branches of science help in advancing the question, and facts arise in support of the philosopher's theories. By a recent inquiry

into the amount and nature of the rain-fall at the observatory, Paris, it has been proved, that from the 1st of July 1851 to the end of June 1852, the quantity of azote combined therewith was—omitting fractions—twenty-two kilogrammes per acre, being twelve kilogrammes in the form of azotic acid, and ten kilogrammes of ammonia. The quantity of uncombined ammonia in the same time was thirteen kilogrammes per acre; and of uncombined azotic acid, forty-six kilogrammes. In the months when azotic acid was most abundant, there was least ammonia; the former always increases with stormy weather. Besides these elements, the quantity of chlorine present was equivalent to eighteen kilogrammes of marine salt, leaving out the insoluble matters held in suspension.

In all this, we seem to get a glimpse of the law of supply and demand in the great vegetative operations of nature; and we see that those who advocate a more sparing employment of manures are not without good reason for their arguments. In the middle of Russia, corn is grown year after year on the same land with no other fertiliser than the burnt straw; and in parts of Spain, wheat and barley succeed each other without any manure at all. And without going so far for facts, we have them close at hand in one of our midland counties. A few years ago, the Rev. S. Smith, of Lois Weedon, in the neighbourhood of Banbury, instituted a course of experiments on this very point, and with results which are singularly interesting. He took a field of four acres, having a gravelly soil, with clay, marl, and gravel as the subsoil. It had been hard worked for a hundred years; but, except a thorough ploughing, no other means were taken to improve it: not a particle of manure was supplied. Wheat was then sown in single grains, three inches apart, and in rows a foot apart, a space of three feet being left quite bare between each three rows, and this was continued in alternate stripes all across the field. The sowing took place at the beginning of autumn; and in November, when the planted rows began to show, all the intervening three-foot spaces were trenched by the spade, and six inches of the subsoil made to change places with the surface. "In the spring," says the reverend agriculturist, "I well hoed and hand-weeded the rows of wheat, and stirred the intervals with a one-horse scarifier three or four times, up to the very period of flowering in June." The crop looked thin and miserable until after April, when it began "to mat and tiller;" it did not turn yellow in May, and the stalk grew so stout and strong as to bear up well against storms. When harvested the result was highly gratifying, for the yield amounted to from thirty-six to forty bushels per acre, or rather per half acre, seeing that as the alternate stripes were left bare, only one-half of the field was really planted. The quantity of seed used per half-acre was a little more than a peck.

Adjoining the field in which these experiments were carried on was another which had four ploughings, ten tons of manure, six or seven times as much seed, and yet it gave a quarter less to the acre. This might be looked on as an accident, were it not that Mr. Smith has repeated his experiment year after year, and always with greater success. He believes that if all the conditions be literally fulfilled, the same favourable result may invariably be obtained. No manure whatever is to be used; and in the second year the stripe is to be sown which was left bare in the first, and so on, changing from one to the other, year after year.

Here arises the question as to cost; and, in contrasting the expense of ploughing with that of spade-labour, he finds that he takes up only so much of the subsoil as the atmosphere will readily decompose in the year—four, five, or six inches, descending gradually to two spits. He employs six men at 2s. a day, and they dig an acre in five days, making an outlay of 60s. for the whole; but as only one-half is to be dug for the year's crop, the time and cost are reduced by one-half, and thus brought down to the cheapest rate of ploughing. The cost per acre, in the instance above mentioned, was £3 14s.; the return from the four quarters and two bushels of wheat, and the straw, £11 14s.; leaving a profit of £8. It should be understood that the cost includes rates, taxes, interest, scaring, reaping—in short, all the operations from digging to harvest.

The parish in which Mr. Smith resides contains 200 wheat-growing acres. He calculates that fifty labourers would have dug these in two months and eight days; so that, beginning the last week in December, all would be finished by the first week in December, leaving five months for the occurrence of casualties, and their reparation before the crop has grown. His system, after the first ploughing, it will be seen, is based entirely on *spade husbandry*; he is of opinion that it is applicable to thousands of acres of "hitherto impracticable and unremunerating clay."

Schleiden and Smith agree in their faith in nature's unassisted fertilizing powers, if not in their mode of clearing the way for the exercise of those powers. The system of the latter combines fallow without loss; for the yield is double. Nature is left to drop the ammonia, and time is given for its combination with mineral matters in the soil. The atmosphere contains all the organic elements of wheat; and if the ground be kept stirred, uncrusted, and loosened to a suitable depth, they will find their way in; and nitrogen even, as late experiments demonstrate, will be absorbed. As for the inorganic constituents, Mr. Smith believes that they always exist in sufficient abundance, if sought for by frequent digging.—*Chambers's Edinburgh Journal.*

ARTIFICIAL BREEDING OF FISH.

SIR,—Public attention has been strongly directed to this subject of late by various pamphlets and newspaper articles, and much interest has been excited by a description of the success achieved by the French in storing their rivers; and by the experiments of Mr. Ramsbottom, of Clitheroe, for recruiting the exhausted fisheries of Lough Corrib, recently purchased by Messrs. Ashworth. The influence of these examples is spreading rapidly, and there appears to be a growing desire on the part of proprietors of salmon rivers, both in Ireland and Scotland, to avail themselves of this plausible mode of replenishing their waters. It is not wonderful that, after reducing

the artificial breeding of fish to a reasonable certainty, practical men should desire to make a practical use of the discovery; but a little reflection will suffice to prove that it is a mere delusion to expect, by any such means, to increase the number of salmon in a river already stored with those fish.

The French experiments have had no such object. Their attention, as I gather from the scanty details which have reached me through the press, has been directed solely to the introduction of salmon, trout, and other fish, into rivers where they did not previously exist. Having stored the waters, they have left the young brood to take care of themselves, and to

keep up their generation in the ordinary course of nature without further interference.

Ramsbottom has been making experiments on the banks of the river Hodder, a tributary of the Ribble, which divides the counties of Lancashire and Yorkshire; and I believe his objects have been wholly philosophical. His principal aim has been to test the identity of the various kinds of silver-scaled fish which frequent the river, and are locally called "Sea-fish," to ascertain if the ova of each kind would be fructified by the milt of the other kinds, and whether the actual admixture of the milt was necessary to the fertility of the ovum. Beyond these trials, on a small scale, and for special objects, no attempt has yet been made in this country to increase the number of salmon, by providing artificial breeding places. I see from the papers that in the ponds in Galway, Ramsbottom has deposited 40,000 impregnated ova, of which it is expected that 20,000 may prove fruitful. On the banks of the Tay more extensive preparations have been made, and a large sum has been expended in the formation of artificial ponds for breeding and preserving the fish.

The suggestion that the breed of salmon might be increased by artificial propagation, was first made by the writer of this article, in a series of letters to *Bell's Life*, in the winter of 1851-2. I was then engaged in some experiments on the Hodder, and resolved upon constructing a few ponds in suitable situations, upon the property of Mr. Towneley. In the spring of 1852, I spent a couple of days in traversing the borders of the river, in search of desirable sites. As I made my observations, rod in hand, I varied the monotony of the search by an occasional cast of the fly; and as the samples were then congregated together, decked out in their silver livery, preparatory to their annual migration, I was struck by the enormous numbers which the river contained. In one small pool, I caught 5 lbs. without changing my place. This naturally led to a train of reflection; and I began to speculate upon the probable number of salmon fry then in the river, and very soon came to the conclusion that no artificial system of breeding could produce a sufficient number to make any perceptible increase in the quantity. As this is a question of arithmetic, it may be rendered plain to every reader. Assume that a full-grown salmon contains 10,000 ova, which is considerably under the mark. The salmon choose for their spawning places technically called "ridds," the rough beds of gravel which connect the foot of one pool with the head of the next. In the Hodder, these gravel beds occur at intervals varying from 100 to 300 yards. Assume that there are five such spawning places in one mile of water, then ten miles of river would contain fifty of them. Assume that ten fish spawn annually on these gravel beds: the result would be, that in these ten miles of water, 500 salmon would produce 5,000,000 ova; which, if they arrived at the maturity of their parents, would extend in a continuous line, head to tail, upward of 2,000 miles. Now, these results are so startling, as to show at once that it is not from the deficiency of young fry that we have to lament the decrease in the number of salmon. The mischief must be sought for elsewhere.

If only one fish in a hundred, of those which are bred in the river, returned to it mature salmon, we should have to boast of 50,000 annually in the Hodder; yet, for the purposes of this illustration, I have assumed only 500 pairs of breeding fish. If the same calculation were followed with respect to the river Ribble, with which the Hodder forms a junction at Mytton, the Langdon and the Dunross, tributaries of the Hodder, and the various tributary streams of the Ribble, it is probable that the gross produce would require to be multiplied by ten. We should then have this astounding result, that the river Ribble and its tributaries annually breed salmon fry

to the amount of 50,000,000; and yet the fishery at Preston, the great highway of these migratory shoals, produces so insignificant a supply as to be of little or no commercial value. What becomes of this vast body of fish? Allowing that one-half are destroyed before they reach the sea, what becomes of the other half? We have still 25,000,000 to account for. I need hardly say that in the Irish and Scotch rivers the salmon are much more numerous than in the Ribble and the Hodder; and the number of the young fry will be greater in proportion. I have just returned from an inspection of the Hodder, which I have examined minutely for about six miles, and have been quite astonished at the number of fish now breeding. The river is literally "ridded" all over. In one single stream I counted upwards of 30 ridds in full operation.

Now, sir, I take leave to suggest that, until some discovery has been made which will enable us to insure the return of the salmon fry to their native rivers, we shall be no better even if we succeed in adding to the numbers annually migrating to the sea. But I strongly doubt whether by the artificial process we do add to the number of the fish. Any one who has examined the spawning-bed of a salmon, at the time the ova are coming to maturity, will have been struck with the great rarity of a barren ovum; whilst in preparing the ova artificially, unless great skill and care be employed, the majority of them will be barren. I think every practical man will agree in this statement: that the salmon, in her native stream, will fructify and bring to maturity a greater number of the ova with which she is charged than can be accomplished by any artificial means whatsoever.

It must also be remarked, that only a limited portion of the ova of a salmon are mature at a time; that, to obtain the gross produce of one fish, you must handle at least ten or twelve—probably forty or fifty fish; that, in procuring these fish, you must disturb a considerable number of others, and interrupt their spawning at a very critical period; that every fish so handled is more or less injured, and rendered for the time quite sickly and helpless; and that, do all you may, your utmost exertions will not enable you to collect so much as one per cent. of the ova deposited in the river; and that, after all, you have only robbed the river of so many ova, which would otherwise have been deposited there without your aid. Taking all these circumstances into consideration, I cannot conceive how any person can assert seriously that the gross produce of the salmon, in any one river, can be increased by this artificial process.

The only plausible argument in its favour is, that the young, in a prepared pond, may be protected more effectually, during their first year, than the young fry in the river. Whether this be so or not is very doubtful; but, at any rate, the pond-bred fish has all the same dangers to incur, in his travel to the sea, as his brother of the river; and as he has been brought up and fed artificially, he is not half so well prepared to take care of himself, and to rough it in his journey down the stream, as his more natural and more hardy companion.

If, then, it be doubtful whether the hand-reared fish has fewer casualties than the river-bred fish, in his first year; if it be certain that he is less able to encounter the perils of a sea voyage; if it be certain that the salmon will produce a greater number of fruitful ova, by acting upon her natural instincts, than by the unwelcome manipulations of man; if it be acknowledged that, in the poorest salmon-rivers, the young fry in May are to be counted by millions, and rival the herring-shoals for multitude—what hope can we have from the artificial rearing of 20,000 samlets annually, which is so small a number as to make no appreciable addition to those already in the river? Two good-sized salmon would produce as great a

number, without man's assistance. Here, then, we have the result, in the form of a plain rule-of-three sum, the solution of which is manifest at a glance. If two salmon in the river will breed as many young as are contained in the Galway ponds,

what is the nature (expressed in fish) of the Galway ponds?
 Answer: Two salmon!
 Dec. 16, 1853.
 —Manchester Guardian.
 Your obedient servant,
 SALMO SALAR.

TABLE OF WEIGHTS OF PRIZE AND OTHER SUPERIOR ANIMALS EXHIBITED AT THE SMITHFIELD CLUB CATTLE SHOW, DECEMBER, 1853.

DESCRIPTION.	OWNER.	What prize awarded.	PURCHASER.	WEIGHT.					
				CARCASS		HIDE.		FAT.	
				st.	lb.	st.	lb.	st.	lb.
DEVONS.									
STEER	Mr. Geo. Turner, Barton	2	Mr. Curtis, Andover	120	0	7	4	15	0
OXEN	Mr. Jno. Coate, Hammoon	1	Mr. C. Frampton, Wimborne	191	0	16	5	21	0
	Earl of Leicester	2	Mr. E. V. Collingwood, Paddington	140	0			18	4
HEIFER	Mr. S. Farthing, Bridgwater	1	Mr. Stedwell, Twickenham	120	2			17	0
COW	Lord Portman	2	Mr. Dominy, Blandford	158	3	10	6	21	5
HEREFORDS.									
STEER	Earl of Radnor	1	Mr. H. Edwards, Tonbridge Wells	133	0				
OXEN	Mr. J. Niblett, Filton	1	Mr. J. Bancroft, Great Grimsby	108	0	14	0	21	0
SHORTHORNS.									
STEERS	Mr. R. Lynn, Stroxtou	2	Mr. H. F. Hill, jun., Harrow	166	6	very light		25	4
OXEN	Mr. E. Frost, Linton, Cambs.	2	Mr. Ferris, Bath	180	0	13	6	25	0
SCOTCH.									
STEER	Rev. J. Arkwright, Harlow	1	Mr. Mann, Croydon	184	0	11	0	14	6
HEIFER	Earl of Leicester	1	Mr. Speed, Chelsea	163	0	11	1	23	3
OTHER PURE BREEDS.									
NORFOLK OX	Mr. J. H. Gurney, Norwich	1	Mr. Collingwood, Lamb's Cond.-st.	132	7			20	1
LONG HORN COW	Mr. J. Caines, Chesleburne	1	Mr. Kellaway, Dorchester	62	12	12	4	13	2
CROSS BREEDS.									
OX	Mr. W. Hewer, Sevenhampton	1	Mr. R. Brooks, Hampstead-road	185	4	12	3	18	5
COW	Mr. W. M. Farrer, Swaffham	1	Mr. Petkurbridge, Hastings-street, Burton Crescent	136	4			19	2
SHORTHORN.									
No prize	Sir Harry Verney		Mr. Cooper, Mills-st., Macclesfield	275	0	17	2	33	2

TABLE OF WEIGHTS OF PRIZE AND OTHER SUPERIOR SHEEP EXHIBITED AT THE SMITHFIELD CLUB CATTLE SHOW, DECEMBER, 1853.

Description.	No. of Animals.	Numbered in the Catalogue.	Owner.	What prize	Purchaser.	Carcass.			Hide.	Fat.
						at.	lb.	lbs.		
LONG WOOLS.	3	145	G. S. Foljambe, Worksop	1	Mr. T. Baker, Old Kent-road	70	2			46
	3	147	I. Mudford, Thurlaston	2	H. Barclay, Gt. Titchfield-street	72	0			
	3	148	Mr. Hall, of Bawtry	3	Mr. Phillips, Somerset	54	6	54½		42
	2	153	Mr. Bradshaw, Oakham	3	Mr. Townsend, York-rd., Lambeth	35	0	18		12
	3	160	Mr. W. Slatter, Stratton	1	I. Potheary, Esq., Southampton	70	5			40
CROSS BREED	3	181	Mr. S. Druce, Eynsham	1	Mr. Holmes, Fore-st., Cripplegate	66	7			
	3	182	Mr. I. Hitchman, Wheatley	2	Mr. Emery, Leyton	66	0			
	3	188	Lord Walsingham	1	Mr. Matlock, Marsham-street	48	1			
SHORT WOOLS.	3	207	Duke of Richmond	1	Mr. T. King, Paddington	61	5			
	3	230	Do.	1	Mr. Edwards, Tunbridge Wells	47	0			
	3	214	Mr. Foljambe, Worksop		Messrs. Stevens, Oxford	54	0			
	3	234	Earl of Radnor	2	Do.	60	0			
	3	241	Mr. S. King, Hungerford	1	Mr. Orris, De Beauvoir-square	65	2			
EXTRA STOCK	1	174	Lord Berners	S. M.	Mr. Colebrook, Praed-st., Pdgnton.	21	0	18		17
	1	199	Mr. C. Howard, Bedford	C.	Mr. Morris, Chelsea	21	1			23
	1	204	Mr. Hitchman, Little Wheatley	S. M.	Mr. Colegate, Bell-al., Moorgate-st.	19	4			26

EXHIBITION OF IMPLEMENTS AT THE SMITHFIELD SHOW.

Before entering into details, allow me to make a few general remarks upon the progress, both as regards the exhibitors and the accommodation afforded them as well as on the opportunity given to the public to examine them.

In the first place, the progress of the exhibitors has been great; inasmuch, as one finds but few of those extraordinary productions of mechanical genius that are beyond the comprehension of the best practical farmers—such as were wont in former years to haunt this exhibition as well as all others in the kingdom. Thanks to the thorough tests given at the Royal Agricultural Society Meetings and similar institutions, which have so far purified the various show-yards, that we can with pleasure go from stand to stand, scrutinizing the various improvements made in each returning season upon the appliances of agriculture. We are gratified to find that the various mechanics are, in general, studying the three great requisites in agricultural implements and machinery—namely, simplicity, durability, and lightness. There are of course other principles necessary: they should be so constructed, that in repairing any breakage by accident or wear, any part could be replaced with as little disturbance of the original frame-work as possible; they should also be constructed so as to absorb the least power in accomplishing the ends desired, with the utmost efficiency. We are pleased to see that the exhibitors are attending more to these points every returning season, and we may with great confidence say, that, although the show has not (within doors) been quite so extensive as last year, yet the addition of the exhibition of steam-engines in the yard makes this surpass any former exhibition of engines, machines, and other appliances of agriculture.

We are aware of the difficulty there is in obtaining the means of extending the space; yet we are convinced that it is possible, by architectural contrivance, to obtain much valuable accommodation. The present plan of laying off all the stands an equal width is wrong, as there are many things that could be exhibited in less width, while there are other light machines that cannot be shown upon the area of stand as allowed this season.

We think that there might be, indeed ought to be, a rule to prevent persons bringing more than one machine of the same kind in every respect, as one is sufficient, and the room would be better employed when otherwise occupied. Of course, we do not object to the exhibition of various sizes of the same machine, &c.

The time is drawing near when this will be an exhibition of models of agricultural steam engines, machines, implements, and farm buildings of a portable nature, stack-stands, &c. In fact, it is evident that weight is not the best test of what ought to be shown in full size. We think that

both weight and cubical contents should be taken into consideration, models only being allowed for all above certain size and weight, no model being allowed more than three inches to the foot. If such rules were entered into, there would be more room to spare for smaller specimens.

We are afraid that the exhibition of the steam engines in the yard was not a step in the best direction, neither do we think it has given much satisfaction either to the public or the exhibitors; indeed, except sufficient space could be given (equal in all its dimensions) to each exhibitor, to show his steam engine driving his combined thrashing machine or other mill or machine, there can be no gratification to those who wish to compare any one with the rest. At this metropolitan show, it is impossible for any machine to be put fairly to work; therefore, none should be allowed to be put to work at all. Of course, there can be no objection to moving the machinery, so as to show visitors its action. We are the more prompted to be firm in this opinion from seeing, from year to year, mills, &c., brought forward at this show, that never dare enter the arena of competition for the Royal Agricultural Society of England's prizes, where every opportunity is given of fairly testing the various engines, machines, and other appliances of agriculture.

On the stands from 1 to 6, of Messrs. Thomas Gibbs and Co., seedsmen, corner of Halfmoon-street, Piccadilly, we observed some excellent grass seeds of every variety required for either sowing land for permanent sheep or cattle pasture or meadow, as well as water meadows; mixtures for gentlemen's lawns, parks, and grass plots; and the best grass seeds for alternate husbandry. We were pleased with the specimens of the varieties of ryegrass exhibited; and we hope the sowers of these seeds may, after proper cultivation, realize a similar bulk to these samples. The turnip seeds were sound and good in quality; and the specimens of roots exhibited, of the several sorts of swedes, were beautiful in symmetry, and excellent in quality. The Red-topped Yellow Hybrid is an exceedingly good sort to grow upon soils of rather heavy character, where they produce large crops, of good quality. The Green-topped White, which is a first-rate sort, White Globe, and Red Norfolk, were splendid bulbs, possessing much merit in size, symmetry, and quality. They exhibited some excellent parsnip seed, and a few beautiful specimens of that most valuable but neglected root. The farmer of strong, loamy soils should give it a fair trial. Nothing excepting the potatoe is equal to it for feeding pigs; it is also capital for dairy cows. Of Kohl Rabi seed this firm exhibited some of good strong character; and the bulbs of both the purple and green sorts were large in size and beautiful in shape. This bulb is not so much cultivated as its merits and profitability

demand. Farmers should give it a fairer trial. Messrs. Gibbs also exhibited seeds of lucerne, sainfoin, and all other plants cultivated upon the farms of our country, as well as wheat and barley of great variety.

Stands 7 and 8 were occupied by Thomas Bigg, where he exhibited his far-famed sheep-dipping apparatus and composition for cleansing their skin from ticks, flies, &c.,. It is useless for us to occupy space in telling the merits of these things, that are so widely known, and the effects of which in every locality bear witness, by practical demonstration, to their inestimable value in giving comfort to the flock and profit to the farmer, by the increase of both wool and mutton.

Stands 9 to 14, occupied by Mary Wedlake and Co. They exhibited a useful chaff-cutter, a good oat-bruising machine, and a bean-splitter; these are three machines that ought to be found in every horse-keeping establishment, for nothing benefits horses (in fact, all animals) more than well masticating their food in the animal's mouth, that induce them to swallow. This firm also exhibited hand-mills for emigrants, to grind their own wheat; at the same time dressing it: also a simple gorse-bruise; an implement that, if efficient, would be of vast importance in many districts of the country; as there are thousands of acres that could not be more profitably employed than in the cultivation of furze, for the production of beef and butter.

Stands 15 to 17 were occupied by Messrs. George Gibbs and Co., seedsmen, Down-street, Piccadilly, London, on whose stand we observed samples of the various grass-seeds of excellent quality, and very moderate in price. This firm furnish the different sorts separately to those who may have studied what proportion of the best grasses is required, that are natural to the soil about to be laid out to permanent pasture; and they may with great safety be trusted to supply mixtures required for every variety of soil, to form either cattle, sheep-pasture, or meadows, whether dry, upland, or water meadows. This firm also exhibited samples of the seed of every variety of clover and grass best suited for alternate husbandry; indeed, it is to be regretted that farmers study so little the advantages that their flocks and herds would derive from a greater variety of grasses being sown under this system of farming.

Stands 18 to 20 were occupied by Mr. Skirving, of Liverpool, nursery and seedsmen. His stand, as usual, was graced with an exhibition of colossal specimens of his far-famed Swede turnips: these bulbs were scarcely beat by the produce of the Emerald Isle—which were nearly all Skirving variety. It is now ascertained that for all soils under the influence of a humid climate, there is no other sort equally profitable to the farmer; as well as under dry warm climates where the soil is deep or inclined to be heavy or fenny; but on the light dry soils of the south of England they are inclined to run to long necks, which is much objected to by farmers in general. Mr. Skirving also exhibited excellent specimens of

his well-known purple-topped hybrid yellow turnip, for which he has been so long famed, with his green-topped yellow and other varieties; indeed, his show of roots were not excelled, if equalled, by those from Ireland, when the three points—size, symmetry or form, and quality—were all taken into consideration.

Stands 21 to 22 were occupied by the firm of Benjamin Edgington, where he exhibited an assortment of sacks at a great variety in price, and an equal variety in quality, which received considerable attention from the farmers and others; also an assortment of rick cloths, varying in quality and price to meet the views and purses of every farmer in want of such indispensable requisites, the best of which are always the cheapest in the end, provided care be taken never to fold them up except when thoroughly dry. We are aware, from observation for a great number of years, that there are more than seventy per cent. of the rick cloths in use rotted by carelessness.

On stands 23 to 26 were exhibited by Messrs. J. and Fred. Howard, of Bedford, their justly-celebrated ploughs, for which they have obtained so many prizes at agricultural meetings throughout the three kingdoms. These gentlemen also exhibited their patent cast-iron ploughshares, so well known for their power of standing an excessive amount of wear, without loosening their edge, which is of vast importance to the farmers of rocky, gravelly, and sandy soils.

On Stands 27 to 32 Messrs. Hornsby and Son exhibited their corn winnowing and dressing machine, which for years has carried all the prizes at the agricultural meetings, where it has stood many a test, but always has won easily, it is so fast driving all others out of use. They also sent drills of various sizes: these are machines that this firm have long been one of the best constructors of, and none can excel them in quality of material and workmanship. They also exhibited a first-rate cake-breaker, which has been widely used and highly spoken of by farmers.

Stands 33 and 34 were occupied by Thomas Lloyd, who exhibited a series of steel mills, that are very useful for the exercise of patience and the muscular system; inasmuch as these mills cut up a great portion of the bran amongst the flour, the bread will impart an increase of muscular development: thus they are to some extent on the self-supporting principle.

On Stands 35 to 41, Mr. Frances Arding, of Uxbridge, exhibited his royal Albert cultivator and horse-hoes (well-known useful implements): he also showed his patent monogram bolter thrashing machine. There are some excellent principles about this machine, and we have no doubt it is a good thrasher, but the name is too far-fetched for the present age.

On Stand 41, Mr. T. H. Cuff exhibited his horse, cattle, and sheep medicines, well-known throughout the country.

On Stand 42, Mr. Freeman Roe exhibited his pumps and other matters connected with hydraulics, gas, and sanitary fittings, for which he is justly known as an excellent engineer.

On Stands 43 and 44, Mr. J. Ridgway was

spreading intelligence to the farmers and others of what other great men had done, or calculated might be done, to increase the amount of human food, by better management of our lands, herds, and flocks.

On stand 45, Mr. Chivas, seedsman, Chester, exhibited his now justly celebrated orange jelly turnip, a description that should be tried by every farmer for late sowing after vetches, peas, rye, and winter oats.

On stands 46 to 61, Messrs. Dray and Co. exhibited a large assortment of Richmond and Chandler's chaff-cutters, linseed and grain bruisers: their workmanship and taste on this as on all former occasions stands unrivalled; the immense demand proving that their efficiency is equal to the general demands of purchasers. These gentlemen also showed pumps, pig-troughs, wire fence, Lyndon's steel forks, spades, draining tools, &c.; in fact, they furnish any thing and every thing required by the farmer.

On stand 62, Messrs. Bell and Co., Brick-lane, Old-street, London, exhibited a great variety of water-proof rick-cloths, cart, waggon, and other coverings of the same material at various prices; also tarpaulins, sacks, and, indeed, every description of cloth for outdoor covering, &c.

On Stands 63 to 72, Messrs. Burgess and Key exhibited their patent corrugated gutta percha suction pipe, which is of great importance where flexibility combined with strength are required. Also their patent seamless canvas hose, which, for lightness and cheapness, is not equalled. They also exhibited leather riveted hose, gutta percha driving bands (both round and flat) of every variety of size and thickness.

On Stands 73 to 75, Mr. Hugh Carson exhibited a useful root cutter or grater, for cutting turnips, &c., into shreds, to mix with chaff: this machine, if expeditious enough, is a step in the right direction. He also showed a compound lever cheese press, worthy the notice of the dairy farmer.

On Stands 76 to 83, Messrs. Smith and Sons, of Peasehall, exhibited their drills of different sizes, which, for simplicity and efficiency, have stood, up to this time, great favourites of the farmer. Indeed, it was the Smiths, of Peasehall, who were, we may say, the men who brought the drill into such a state of efficiency that the owners of those made thirty years ago are still using them, without being much behind their neighbours.

On stands 84 to 95 Mr. Crosskill, of Beverley, Yorkshire, exhibited models of his widely-used and celebrated carts, waggons, clod-crushers, Norwegian harrows, land-pressers, harrows, horse-rakes, Archimedian root-washer, liquid manure carts, sanitary carts, and eccentric mills; the whole of which implements and machines are so familiar to the agricultural public, that Mr. Crosskill has only to exhibit the models of them, to remind the farmer of his wants, to obtain his patronage. He also exhibited his Hussey's American Reaper, which may as well be put on the shelf, as unfit to meet the wants of the British farmer. With it was his improved Bell's Reaper, as

carrying out the excellent views of Mr. Amos. Mr. Crosskill has now brought this machine to something very close on perfection. He has reduced the weight about 5 cwt.; the draft is also reduced more than a third, and it is now equal to the draft of a plough upon light lands.

On stands 96 to 98 Mr. Corrigan, the manager for the Royal Dublin Society, exhibited specimens of the produce of the Emerald Isle. The swedes were quite equal, if not superior to those of Mr. Skirving's, who has never been equalled by any other person at this show. Such being the case, either the growers of these roots know their business better than English growers in general, or their soil and climate is better adapted for their growth. The carrots were beautiful in shape, quality, and size; but the weight grown per acre was far short of what we have in England. The mangel wurzel were splendid roots; but the weight grown was far below a fair crop in the southern counties of England. The kohlrabi were fine specimens of both sorts; and the potatoes were all that could be desired, even by Mr. Corrigan himself. The cabbages were the admiration of both judges and novices: their immense size, pure whiteness, solidity, beauty of form, and similarity gave proof of the genuineness of the seed, perfection of cultivation, and adaptation of both soil and climate to their growth. The red or purple cabbage were equal to the white. The butter was very good; and we hope there is plenty of it ready for shipment to our markets, where it will be welcomed. We have often been told, heard, and read about Ireland not being a grain-growing country; but we think that the beautiful samples of wheat, barley, and oats exhibited at this Smithfield show will be some argument against this. We know from practical experience that good crops of wheat, barley, and oats can be grown in the whole of the midland and eastern counties of Ireland; and when feeding a part of the turnip crops off on the land with sheep is more practised, we have no doubt the grain will be greatly increased both in quantity and quality.

On stands 99 to 105 Mr. Samuelson, of Banbury, (successor to Gardiner), exhibited his "Gardiner's turnip cutter," which he has improved by applying a pair of good long handles to move it about; on others a pair of good high wheels; he also showed chaff cutters, oat bruisers, and bean splitters of a useful description; and with them his widely-heard-of digging machine; we are not sanguine of the success of this implement until it is made so wide that two horses drawing abreast will not have to tread upon the work already done. Much praise is due to Mr. Samuelson, for the advance he has made with this implement.

In stands 106 to 109 Mr. Busby, of Newton-le-Willows, Bedale, Yorkshire, exhibited his ploughs and horse-hoe, for which he has received so many prizes at the shows of the Royal Agricultural Society's meetings, and others for the last six years. These implements are now so generally known, that nothing is required on our part to spread their well-earned fame. He also exhibited his celebrated carts, with

Bellerby's tipping-apparatus. This is an excellent tipper; but the weight tells greatly against it; however, the advantages are of importance, especially in a lilly country.

On stands 110 to 115 Messrs. Smith and Ashby, of Stamford, exhibited a haymaking machine, which has for a great number of years taken every prize at every show; indeed, its superiority to all others is now universally admitted. They also exhibited their horse-rake, which is well-known as an efficient implement, and a strong useful cart—materials and workmanship good.

On stands 116 to 118 Messrs. Wedlake and Deady, of Hornchurch, Essex, exhibited chaff-cutters and other machines and implements that are well thought of in their own locality.

On stand 119 Croggan and Co., of Dowgate-hill, showed their asphalt for roofing, covering damp walls, &c. This is a useful material for covering temporary sheds, &c.

On Stands 120 to 122 Mr. R. Coleman exhibited his justly-esteemed grubber or scarifier, which is an implement that gives general satisfaction; also his now well known expanding harrows. He also showed a very well arranged simple little winnowing or dressing machine, only using four fans instead of five or six, as others do.

On Stands 123 to 138 Messrs. Garrett and Son, of Leiston, Saxmundham, exhibited their assortment of drills, of every variety; the numberless prizes given by the Royal Agricultural and other societies to these drills, stamp them with merit above our praise. We also observed their now well-known horse hoe. It can be used to great advantage in thinning-out turnips drilled upon the flat by crossing the drills at such an angle as will leave the plants in one row opposite the openings in the other. They also showed chaff cutters, roller mills, cake breakers, fixed steam-engine, winnowing machines, and a horse-power thrashing machine of a very useful description. They also exhibited a steam-engine in the yard, and combined thrashing machine: the merits of these are now well known. The Atkins's automaton or self-raking reaping machine has been very much improved by these enterprising and ingenious gentlemen since the trial at Gloucester. We have no doubt but this machine may be got to do the work nearly as well as any man with a rake can do it: the principles of mechanism used to give the singular and extraordinary movement to the rake are a piece of ingenuity of the first-class, and truly original. We are sure that in the hand of Messrs. Garrett and Son, and Ransome and Sims, the automaton reaper will be brought to a pitch of improvement surpassing expectation.

On Stands 139 to 141, Mr. P. Stanley, of Peterborough, exhibited his widely and properly extensively-patronized cattle and pig food steaming apparatus, for which he is getting immense sale in Ireland, where the stall-feeding of cattle and the fattening of pigs are perhaps as well understood as in any country in the world.

On Stands 142 and 143, Messrs. Tuxford and Son, of Boston, exhibited their fixed steam engine, which has always taken a high position at the Royal Agricultural Society of England and other shows; and for excellence of workmanship and neatness is not excelled by anything in the show. They also exhibited their portable steam engine with a peculiarity worthy of notice, namely, the whole of the engine is in a neat iron house at the end of the boiler, where it is safe from malicious damage, or the evils arising from dust or dirt, or the wet while at work.

On Stands 144 and 145, Mr. Edward Weir, of Bath-place, New-road, London, exhibited his force pumps, mills, and draining level; also a hose reel, for the purpose of coiling up canvas or other hose in great lengths: this reel is upon two wheels, with a pair of handles, so that a man transports the hose from one place to another with great facility.

On Stands 146 to 148, Mr. Hunt exhibited a clover husker and blower, combined: this appears a useful implement, well adapted for the purpose intended.

On Stand 149 to 153, Messrs. Barrett, Exall, and Andrews exhibited their portable steam-engine, in the yard; also their fixture steam-engine, which has frequently carried away the palm of merit at our agricultural shows. They also exhibited their horse-power thrashing-machines, chaff-cutters, grain-bruisers, and barley-aveller, all of known excellence. The barley-aveller is a clever, compact machine, upon good principles.

On Stand 154, Mr. Hayes, of Huntingdon, exhibited his small grain grinding-mill. It looks a useful article, but as we could not see it work, we refer to the Royal and other societies, where such a mill has long been looked for.

On Stands 155 and 156, Mr. W. Smith, of Little Woolstone, Bucks, exhibited his reaping machine. Last year this machine was shown with a series of rotary cutters in a horizontal position; this year the cutters are in a vertical position, which is a distinct feature, and is not to be met with in any other, and is therefore a piece of original ingenuity. This reaper also lays the crop down before cutting it, therefore there need be no question about cutting laid crops. This also is an original invention. We must give Mr. Smith credit for originality if we cannot, at present, for success; however, energy and perseverance know no defeat.

On Stands 157 and 158, Mr. Comins, of South Molton, exhibited his horse-hoes, scarifiers, subsoil ploughs, and turnwrest ploughs, for all of which he has long been known as a good maker.

On Stand 159, Mr. Nicholls exhibited his horse-hoe and paring plough combined. This is an implement upon sound principles, but too clumsily made, as well as too complicated in its details.

On stand 160, Messrs. Reeves exhibited Chandler's liquid manure drill. This drill has proved itself of the greatest advantage to the farmers of light dry sandy soils in dry seasons, the application of a few tons of liquid manure with the turnip and other green crop

seed making a good and even braird almost a certainty.

On 161 and 162, Messrs. J. Free and Co. exhibited Ewart's well-known and extensively used rules and gauges for ascertaining the weight of cattle, sheep, and swine; also the cubical contents, as well as weight, of hay, straw, and straw staks.

On 163 and 164, Messrs. Whitnee and Chapman had several steel mills of a useful description for those who intend emigrating to the Far West; they also showed a corn crusher of good construction, simple of adjustment, efficient in operation, and of easy repair.

On stand 165, Mr. Bennett, of Cheapside, London, exhibited a great assortment of thermometers and barometers, at such prices that no person need be without these important articles, so essential to the farmer. We were surprised that this gentleman had not some simple rain gauges to show the farmers; for there can be nothing of more importance than to know to a certainty how much rain falls in a given time, many of our operations depending so much on this.

On stands 166 to 168, Messrs. Kealy and Co. exhibited their turnip or root-cutters, which were clearly described and shown by their salesman, Mr. Stevens. These root-cutters are fast making way wherever they get introduced. We observed a very unique little barrow turnip-cutter, simple and efficient, and portable to the greatest degree. The leading advantage Kealy's machines have over others is, the thickness can with the greatest facility be increased or decreased—from upwards of an inch to thin shreds for mixing with chaff.

On stands 169 and 170, Mr. Smith, of Kettering, exhibited his extensively used horse-hoe and winnowing machine. They are both useful implements, doing much credit to the maker.

On 171 and 172, Messrs. F. McNeil and Co. had their roofing asphalt, ship-sheathing felt, thick hair felt for deadening sound in thin partitions and under floors, thick hair felt for covering steam-pipes, boilers, &c. These felts are used to a considerable extent.

On stands 173 to 175, Messrs. E. R. Turner and Co., of Ipswich, exhibited their roller mills of different sizes for crushing linseed and corn. This machine took the Royal Agricultural Society's prize at Gloucester, after a severe trial. Mr. Turner has attached a simple and efficient bean-splitter to this mill, so that beans, after splitting, can be crushed almost into flour. They also showed a capital little mill for the use of men keeping only one or two horses; this mill flattens the grain without parting it, which makes it far more palatable.

On stands 176 to 181, Mr. Williams, of Bedford, exhibited his ploughs, harrows, horse-rakes, and tile-making machine, for all of which he has at different times stood first on the awards list of merit.

On stand 182, Mr. Ball, of Rothwell, Northamptonshire, exhibited his ploughs, for which he has taken so many prizes at the Royal Agricultural Society's and

other shows; but the best prize is the immense demand there has been for these ploughs from all part of the world.

On stands 183 and 184, Messrs. Tasker and Fowle, Andover, exhibited Spooner's water and dry manure drill. This is a machine that deserves the serious attention of farmers, especially those in the southern and dry climates of our country and colonies. Both from its novelty and importance, we subjoin the following particulars of its action:—

1: The water and the manure apparatus being independent of each other, it admits of the application of almost any amount of water per acre (from one to twelve hogsheads), which can be varied to any extent, whilst the distribution of the manure may remain the same; or, on the other hand, the water may be uniform and the manure varied at pleasure, so that a poor spot in a field may receive an increased quantity of manure. 2: Being fitted up with Tasker's patent rotary tumblers, the manure is measured out with mathematical accuracy, every row, and, indeed, every plant receiving the same, which can scarcely be accomplished when the manure is previously mixed with a large quantity of ashes, or rudely suspended in a quantity of water. 3: It admits of the application of bones, superphosphate of lime, guano, and, indeed, of every kind of concentrated manure, in conjunction with water. 4: Combining in itself the advantages of a water and a dust drill, it may be used either with or without water, at the option of the owner, or as the situation of the field, the state of the weather, or the supply of water may render desirable. Thus it obviates the necessity of an agriculturist purchasing or hiring two separate drills. 5: As the water is discharged on the principle of gravitation, no power is employed in raising it, and the wear and tear of buckets and other apparatus is dispensed with. The drill, therefore, works lighter than any other drill constructed on different principles, and discharging into the earth an equal weight of solid and liquid matter. 6: Whilst the simplicity of its construction secures it from getting quickly out of repair, it is assisted in this respect by the fact, that, as the liquid is not impregnated with the acid properties of the manure, the rusting and injury of the metal it comes in contact with is altogether avoided.

On stand 185, Mr. Grove, of Baddow, Essex, exhibited his turnip and mangel-wurzel seeds, which were of good quality; he also showed specimens of swedes, turnips, and mangel-wurzel, that for form and quality were not to be excelled; they were not however anything extraordinary in size, indeed many of them were only moderately large.

On stands 186 to 188, Messrs. Holmes, Brothers, of Norwich, exhibited their thrashing and winnowing machines, drills, and roller mills. These gentlemen have long stood high as makers; and there is little doubt but that the family will fully maintain the position they are left in, and keep pace with the growing wants of the age.

On stand 189, Messrs. John Jones and Co., Sheffield, exhibited their patent gutta percha boots for the prevention and cure of foot-rot in sheep. This is one of the most valuable inventions brought out of late years. It is well known that dry feet is indispensable to the cure of halt in sheep; and these boots or goloshes, being impervious to moisture, keep the feet warm and dry upon cold, wet, or damp land.

On stands 190 to 192 Mr. Medwith, of Baker-street Bazaar, exhibited some iron tubular hand drag-rakes, to which we would call the attention of farmers. They are light, strong, and durable articles. He also showed a set of zinc poultry fountains, for supplying lime-

water; feeding-troughs; coops, all worthy the attention of poultry-fanciers.

On stand 193 Mr. Read, of Regent-circus, Piccadilly, exhibited his veterinary instruments—we would rather say farmers' instruments, as every owner of stock ought to have them—the probangs, for sheep and cattle; and the injecting syringe and tube.

On stand 194, Mr. E. A. Robinson, of Harp-lane, Great Tower-street, had an assortment of all sorts of culinary utensils, made of sheet-iron, and enamelled with glass. These are articles that will bear any amount of abuse; in fact, being made of wrought iron, they cannot be broken; but we fear, if they get indented, the coating of glass might come off—if not, they will be everlasting in wear.

On stands 195 and 196 Messrs. Nalder and Knapp, Clanfield, near Bampton, Oxon, exhibited a winning machine, with a rotary separator under it, or rather combined, by which means they say they can finish the cleaning or dressing of grain, by passing through the machine once only. We fear it must be but a slow process where there is much chaff.

On stand 197, Mr. Lyon, of Windmill-street, Finsbury, London, exhibited his noiseless sausage-meat-cutter and filler. A simple little machine that also cuts up vegetables into small dice for soup.

On stands 198 to 200, Mr. A. W. Cooner, King William-street, London Bridge, exhibited his patent brick and tile machine. We could not however see any principle about this machine that would render it a competitor with Clayton's well known and universally admired brick and tile machine.

On stand 201, Messrs. Barnard and Bishop, Market-place, Norwich, exhibited an assortment of poultry and pig feeding-troughs and water-troughs. They are made of cast-iron, and are neat, convenient, and durable.

On stands 202 to 204, Mr. Woods, of Stowmarket, Bury St. Edmunds, Suffolk, exhibited his roller-mills for crushing linseed and grain. These are well known as simple, light-working, durable machines. He also showed a first-rate Gardner's turnip-cutter; a simple neat barley-aveller of considerable merit, and low in price; and a capital bean-mill.

On stands 205 and 206, Mr. Cambridge, near the railway-station, Bristol, exhibited a variety of sizes of his roller. We fear that reducing the diameter down to one foot cannot be any improvement, except it be that of reducing the first cost.

On stands 207 to 208, Mr. Crowley, of Newport, Bucks, exhibited a useful cart for agricultural purposes, where waggons are used for harvesting, as the harvest-shelvings or raves are not well made for retaining the load.

On stand 209, Mr. Huckvale exhibited his rotary turnip-thinning horse-hoe. This was the original invention for this purpose, but it has been taken up by another firm, who have spread its fame far more widely than the inventor did.

Stands 210 and 211 were occupied by the owners or representatives of the *Gardener's Chronicle*.

On stands 212 to 215, Messrs. Cogan and Company, 48, Leicester-square, London, exhibited an assortment of glass dairy utensils, reduced in price. The superior cleanliness and ease of keeping sweet, with the impossibility of the glass vessels getting impregnated with acidity, render these milk vessels all that can be required. They also had Lord Keane's bee-glass; lactometers for testing the quality of milk; and some glass milk measures, which are a great improvement as regards cleanliness.

On stand 216, Mr. Maynard, of Whittlesford, near Cambridge, exhibited his oilcake-breaker, which has been well spoken of as a breaker of cake for manure.

On stands 217 to 218, Messrs. Halifax, of Oxford-street, were exhibiting their very necessary farmers' account-books.

On stands 219 and 220, Mr. S. Nye and Company, Wardour-street, Soho, London, exhibited an assortment of different sizes of their mincing-machines for mincing and mixing sausage-meat, and filling the skins; also mincing suet—reduced to a state like butter. The simplicity, cleanliness, neatness, and durability, together with the despatch with which it gets through its work, ought to induce every housekeeper to try this machine.

On Stands 221 to 223 Mr. Stacy, of Uxbridge, had his chaff cutters, grain crushers, and other machines for which he has obtained considerable fame in his own locality.

On Stand 224, Mr. H. A. Thompson, of Lewes, exhibited steel forks and tools, and other light articles. He is famed as the vender of the best selection of implements for the farmers of Sussex.

On Stands 225 to 227, E. H. Bentall, Heybridge, near Maldon, Essex, showed his patent broadshare and subsoil plough, which is one of the plain, unadorned implements universally approved of by the practical farmer. He also showed his ploughs, turnip cutter, pig troughs, and oilcake mill, all of which are simple and useful implements.

On Stand 228, Mr. Fisher, of 142, Cheapside, London, exhibited an assortment of safety direction labels.

On Stands 229 to 235, Messrs. Clayton and Shuttleworth, of Lincoln, exhibited a beautiful portable steam engine, for the manufacture of which they have gained so much fame. They also showed an excellent circular saw table: this is a most simple, strong, and well-contrived machine, doing great credit to the makers. They had, again, one of their portable grinding mills, for which they have frequently been awarded prizes: and a steam engine and combined machine in the yard: these are machines for which this firm have received many prizes at the Royal and other agricultural shows.

To Stands 236 to 245, Messrs. Ransomes and Sims, of Ipswich, sent an assortment of ploughs of different makes and sizes, to meet the wants of the farmers of all soils. This firm have for above a century been the leading manufacturers of ploughs; indeed, the majority of the celebrated plough makers throughout the country have merely made some slight

alteration upon one of Ransome's ploughs to please some leading man in his neighbourhood. The fashion of the present time is long mould-boards, but we shall get back to short ones again when the digging machines have made a little more way. This Firm also showed a very good, simple, and efficient barley awner or aveller: in extensive use, and much liked. Their improved grubber, a neat, light, simple, and efficient implement, a cake breaker, chaff cutter, horse-power thrashing machine, mills for hand and power, grain bruisers, and pig troughs of various sizes, all of which implements and machines are good of their kind, the thrashing machine being one of the best. They also exhibited a model of Atkins' American automaton or self-raking reaper, a description of which may be pleasing to our readers.

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 rake off, as 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, and instead of being placed, as usual, flush with the back edges, is in the middle of the blade, and as far forward as the angles of the cutting will allow. The back side, instead of being left straight, is cut zig-zag, and each alternate edge is bevelled 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 to 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 is two feet in diameter, and may be increased if desired. The frame work 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 cent. 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. Since the Gloucester Royal Agricultural Society's meeting, this machine has been subjected to a variety of experiments, and a few improvements, the result of those experiments, have been introduced.

On Stands 246 to 249 Mr. James White, Holborn, London, exhibited a variety of steel mills and grain crushers, which, like other steel mills, require more

patience and power than man in his highest state of civilization is willing to devote to such operations.

On Stands 250 to 255 Messrs. Cottam and Hallen, of Oxford-street, exhibited their stable furniture, made of cast-iron, either plain, enamelled, or galvanized. These are worthy the attention of all horse-keepers.

On Stands 256 to 257 Messrs. John James and Co. had their weighing machines of almost every size and strength. These machines are made upon a simple, strong, accurate, and durable principle—not being liable to go out of repair. The universal farmer's weighing machine, for weighing live stock, cart loads of produce or manure is an article without which no farm can be said to be complete.

On Stands 258 to 259 Messrs. Barry Brothers, Meriton's wharf, London, exhibited Long's Specific for the cure of scab in sheep, mange in horses and dogs. Also Long's Preservative or Patent Sheep Dressing, for the destruction of ticks and lice on cattle, horses, and dogs.

Stands 160 to 161 Mr. Mechi should have occupied with the American combined thrashing machine; but it was too large for admittance, although it looks more like a toy than what it really is.

On Stands 262 to 263 Mrs. S. Staff, of Lawson-street, Dover-road, London, exhibited an assortment of models of marquees, tents, rick cloths, &c.; also samples of cloths, plain and waterproof sacks of different qualities; also ropes and twine, all of which were deserving attention.

To Stands 264 to 266 Mr. Warren, Maldon, Essex, contributed a variety of his ploughs, which are made of timber. They may do for Essex, but we hope not for long; although in some respects these ploughs have recommendations.

On Stand 267 Messrs. J. and A. Armitage, of Bury, exhibited their brick and tile-making machine. This has many good points about it; but must be greatly improved before it will be equal to come into competition with Clayton's patent brick, pipe, and tile-machines. Purchasers of such machines ought to visit the Atlas Works, Upper-park-place, Dorset-square, London, where Mr. Clayton will be able to satisfy all who understand the subject of the superiority of his invention. The great value of his improvement is manifest: it consists in the moulding orifices or dies, having rotating sides formed by rollers (instead of fixed sides, as used by all others). Thus is the problem solved how to make bricks by the expressing principle of machinery, reducing the wear and tear and power required to a minimum.

In the yard, J. S. Wilson and Co., Tavistock-place, Tavistock-square, London, exhibited their cycloidal digging machine. This is very similar to Samuelson's, but the discs are much larger in diameter, and therefore will make easier draft. Like others, it is too narrow to cover the ground a pair of horses abreast traverse. The main evil so far in these machines is the immense power required to draw them, and not turning the soil over.

In the yard too Mr. Gillam, of Woodstock, showed

his seed separator and combined blower. This machine has been greatly improved since the Gloucester meeting. It cleans beautifully Italian and other grass seeds, sainfoin, flax, clover, and all other small seeds.

We have to ask the indulgence of those we may

have in any way neglected—our desire being to do and speak to the general benefit and improvement of the agriculture of our country—without injuring any who, like ourselves, are labouring for its progressive advancement.

THE WHEAT TRADE.

DEAR SIR,—My last letter on the subject of the wheat trade was dated the 29th of September; since which time, almost every day has added to the interest and importance of the inquiry relating to the actual deficiency in the late crop, and means in our power for supplying it. I cannot hold with those who have so sedulously endeavoured to shut their own and other people's eyes to the calamity (for such I consider it) that has befallen us this season, in common with several of the continental nations. On the contrary, I believe that the best effects will arise from obtaining a just estimate of the extent of the deficiency, and from making it known as much as possible, that the country may be prepared for the result, whatever it may prove. And I cannot but think that those, who at the first of the season after harvest endeavoured to smother all attempts to investigate the case, and asserted broadly their belief that the deficiency was far less than was estimated, and the means of supplying it far more ample, have already done a great deal of mischief in checking the free importation of wheat, by rendering it doubtful whether an adequate price could be obtained upon arrival. The advance which took place—after a short period of reaction—just upon the eve of Christmas, when it was expected, even by those who entertained more correct opinions, that a dullness would prevail in the trade, gives the lie to the assertions of these writers. It is now no longer doubtful either whether the deficiency is as large as was apprehended, or whether there will be difficulty in procuring adequate supplies. Three months of the season have gone by since harvest; and the shipping season from the Baltic having closed, although the granaries at those ports have been cleared out almost to a quarter, so inadequate are the supplies considered, that an advance of 7s. per quarter has taken place in the holiday weeks after Christmas, when business is in ordinary years almost at a stand-still.

The present posture of the wheat trade, indeed, may well excite alarm with those who view it in an impartial light, and such is the case with myself. I am neither a grower, nor a dealer, nor a speculator, but simply a consumer; but I have long made the subject my study, and by procuring all the statistical information of by-gone years, and comparing results, I have perhaps acquired as much information on the subject as most of those who undertake to write upon it. We shall presently see how far I have been correct in my estimates of the state of things for the present year.

Many circumstances have arisen since I last wrote, both to increase the difficulty, and enhance the expense of procuring supplies to meet the consumption of the country. Amongst other things, I may state the great advance in freight from the Black Sea, which, with insurance and other charges, now amounts to as much as the cost price of the wheat at Odessa, &c. This is partly owing to the circumstances of the ships being obliged to go thither in ballast, by which the outward voyage is lost; and shipping is so much in request for all quarters of the globe, that the owners do not care to send them to the Black Sea on such terms. This has also operated against our obtaining even the usual supplies from thence; for

although an immense quantity of wheat has been shipped from all the Black Sea and Danubian ports, a very small proportion—probably, not more than five per cent—has passed the Straits of Gibraltar. On the other hand, in addition to the vigorous competition against which we have to contend in all the cereal districts, the war in the Principalities has induced the Turkish Government to follow the example of the Pasha of Egypt, by prohibiting the exportation of wheat from any of the Turkish ports north of the Balkan. At present, the northern ports of the Black Sea and the Danube are open; but how long they will continue so is very doubtful. It now appears that the prospect of war is imminent; and probably, whilst I am writing, the autocrat's fiat has issued for commencing hostilities against us. This will at once place a bar to our commerce with any Russian port, and consequently we may expect no more wheat from the Black Sea, unless under circumstances which will enhance the price indefinitely. We may therefore calculate on having little or no wheat from either the Mediterranean or the Black Sea, and must exclude them from our estimates.

But independently of these serious drawbacks, the prospect is much more unfavourable than when I made my estimates. In addition to France, Austria, and Italy, it appears that in Holland, Belgium, Switzerland, and some other continental states, there is a serious deficiency; and they will be compelled, this year, to import instead of export, and are therefore added to the list of our competitors. To what extent they may require supplies it is impossible to say. France will require from four to five million quarters, and Italy three and a-half millions; which, added to our own requirement of twelve, will make nineteen and a-half million quarters. We may, however, deduct from our own deficiency an acknowledged excess of one million quarters in the stock of old native wheat at the close of harvest—a proof both of the goodness of the previous crop and of the ability of the farmers to hold it. This however, will leave an aggregate of eighteen and a-half million quarters to be scramble for, between the two harvests.

Three months of this period, however, have already passed, and the result, so far as the United Kingdom is concerned, is far from satisfactory. These, in fact, are the three months when the pressure is the least felt; when the home supply is always the largest, and the foreign generally so. Yet so inadequate have been the importations, that it is questionable whether the stock will hold out till the Baltic ports are open in the spring. Certain it is, that until then America is the only quarter from whence we can obtain a supply of any amount. What that amount may be, remains to be seen; but I greatly fear, the sanguine expectations of some of our countrymen on this head will be disappointed. Certainly, the last three months have done little towards realizing them, as the following figures taken from the returns of the Board of Trade will show. I regret that I could not make up the return to the end of the year, but as the December account will not be published until the beginning of next month, it was not to be procured.

IMPORTATIONS OF WHEAT, AND FLOUR AS WHEAT, FOR THE YEARS 1852 AND 1853.

	1852.	1853.
Up to the 5th Sept. Wheat qrs.	1,679,239	3,302,452
Flour as wheat	827,950	653,486
	2,507,189	4,255,938
From 5th Sept. to 5th Dec.	1,356,077	1,608,352*
	3,863,266	5,864,290
Re-exported	33,737	97,268
Total imports	3,829,529	5,767,022

By the above statement it will be seen that in the three months, from September 5 to December 5, we imported in 1852, of wheat and flour, 1,353,077 qrs.; and that in the corresponding three months of the present year, the quantity imported has been 1,608,352 qrs., or an excess over the same period of the previous year, of only 252,275 qrs. And even this very small increase is reduced by the re-exportation, which of foreign wheat has been nearly treble what it was last year; to say nothing of the English and Irish wheats that have been purchased by the French merchants. It is true that upon the whole eleven months, the excess of importations this year amounts to nearly two million quarters; but if the returns are examined, it will be found that it was at the beginning of the year that the largest quantity was imported, and that the greater portion of it had gone into consumption before harvest. Certainly, whatever stock of old English wheat remained on hand after harvest, there was no great quantity of foreign; and I am convinced that my estimate of a surplus of old wheat of one million quarters over the average of years, is not far from the truth, although we can, in these matters, only take a proximate view of them, for want of national statistics.

It is therefore reduced to a certainty that we shall not this year, from harvest to harvest, obtain more than the average quantity of wheat and flour, that is, five million quarters, if we get even that, which I look upon to be doubtful. The quantity which has passed the Straits of Gibraltar this season cannot have been half what it was in the same period of last year; and what we shall in future receive from that quarter depends upon the contingencies of war or peace. If the former takes place, it will at once be a bar to all further supplies from the Black Sea, unless the combined fleets bombard and reduce the Russian ports; in which case, we may give the Odessa merchants a good turn. I think it will be found, when the parliamentary returns are published, that the bulk of the supplies of the last three months have come from the Baltic. The continually advancing price has induced the merchants in that quarter to send off every grain almost they had in stock; and undoubtedly the greater part of it has come to this country. Whether that will be repeated, when the ports of the Baltic open again, upon the breaking up of the frost, depends, like those of the Black Sea, upon contingencies which none can foretell, but which are as likely to be unfavourable as otherwise.

To America then we must next turn; and here I can see no prospect of our supplies from thence exceeding what I stated in my former letter, namely, 800,000 to 1,000,000 qrs., in wheat and flour. I have seen letters from intelligent and "knowledgeable" men, who estimate the exporting power of the States, this year, at two million quarters at the utmost. But of this, they say, we shall not get half, as the French government and other Europeans are purchasing largely, besides what will be required for the West Indies and the Australian colonies, both of which are supplied from North America.

From Canada, we shall probably get a good deal of flour and wheat in the spring and summer. They have had an abundant and favourable harvest, and will have a good quantity to spare. I see by the Liverpool returns that upwards of 40,000 qrs. in wheat and flour have been received from thence at that port in the three months ending Dec. 31. But whatever we may get from the west, I am certain, and I do not form my opinion at random, that we cannot by any possibility obtain wheat

* I see by the return, that in the three months, ending Dec. 31, the quantity imported into London, of wheat and flour as wheat, is 487,193 qrs. A considerable quantity of this, however, has been re-exported to the continent.

enough to meet the consumption of the United Kingdom till another harvest. It is therefore desirable to look out for some substitute for wheat, and the sooner this is done the better.

Indian corn is the most adapted to the purpose of bread, of any cereal next to wheat. I am aware that there is a foolish prejudice against this grain in England; and prepared as it has been by our millers, I don't wonder at it. In Ireland, the same feeling existed previous to, and even during the famine in 1846-7; and to such a height was the prejudice carried, that in one instance, as is well known, a whole family was poisoned by the servants, because the master (a clergyman) insisted upon their eating it, himself and his wife and children setting them the example. One of the sons lost his life by it, and the rest had a very narrow escape. Notwithstanding this, the Irish peasantry now use Indian-corn meal for their stirabout, in preference to oatmeal, and find it much more nutritious. In the United States, corn bread in every shape, from the loaf to the Johnny-cake, is eaten by all ranks of people, and it is set on the table at every meal. This will account for the small proportion of wheat consumed there. Whilst in the United Kingdom the consumption is about six bushels or a sack of flour per head per annum, in the States it is not more than from three to four bushels per head. Indian corn too is much more profitable to the farmer to grow than wheat, on account of the largeness of the produce. They graze largely with it, both of cattle and pigs; throwing it down by cart-loads, in the yards without taking the trouble to shell it. If, however, a profitable market were opened for it here, they would soon send us as much as we required; and such a succedaneum must be resorted to, before this season is over, or a scarcity will be inevitable in the ensuing summer.

I will now turn to the agricultural view of the question, which will, perhaps, be the most interesting to the majority of your readers. I am very glad to find that the farmers, both in England and Ireland, have this year rectified the error they had fallen into, of discontinuing or rather diminishing the growth of wheat. It is abundantly evident that in lessening the cultivation of this and other cereals, by laying down the land for grazing, they did not take into account either the enormous increase in the consumption or the probability of deficient crops. If we look back at the corn trade the last thirty years, we shall find many seasons of depression quite equal in both degree and duration to that which has occurred since 1846; and these fluctuations must necessarily occur, irrespective of legislation of whatever kind; and whoever has watched and studied the market the period I have mentioned must be convinced of this.

Nor is this all. Although in this free and wealthy country we can boast more productive population-returns than the despots who rule over the slaves on the Don or the Vistula, England is not the only country in the world whose people obey the primary law, "Increase and multiply, and replenish the earth!" I have before stated that from 80 to 100 millions have been added to the population of Europe since the peace of 1815. So that, granting that more land has been brought into cultivation in the interval, still consumption is treading upon the heel of production, and, in many countries, is stepping before it. It is, in fact, only in Southern Russia and the Turko-Danubian provinces that this is not the case; and 'tis well for us that it should not be so there. It would now be impossible for us, on an average of years, to obtain wheat enough from the Baltic and America to supply our increasing consumption; and, therefore, the opening that has occurred in the Black Sea may be considered a positive blessing to this country. I am sure the closing it against us by a war would be doubly a curse, however unavoidable it may now be.

The more wheat therefore is sown and grown this season, the better for the grower. Such will be the exhaustion of the stocks that the next crop will be begun upon as soon as it is harvested; and good remunerating prices will rule throughout the year. The land too, in consequence of the late frost and snow, is in a much better state to bear a crop than last year. Were I a farmer, however, I would not trust to this alone, but would top-dress every acre of my wheat, in order to grow as large a crop as possible; for it is certain to pay for whatever may be expended upon it.

There is one more question connected with this subject which I wish to press upon those whom it may concern. I am aware that, in broaching it, I am recommending a departure from a system which has been adopted in all its length and

breadth—whether for good or for evil, this is not the place to say. There is, however, no rule without exception; and looking at the state of Continental Europe, and our own exigencies, I say it would be wise in our government to follow the example of the Continental States, and for a time prohibit the exportation of wheat. It is abundantly evident that we are shut out by competition, prohibition, war, and rumours of war, from fully half our future and usual supply; whilst our own crop is more deficient than has been known for many years. It is therefore one of those desperate emergencies in which self preservation rules before all the economies in the world. Whatever we export now, we shall have to re-import at a higher price, if we can get it at all, which is very doubtful. At any rate, the state of affairs both social and political renders it desirable that there should be no unnecessary profusion in the disposal of the stocks we may accumulate, so certain as we are that we shall want it ourselves.

Yours truly, S. C.

London, Jan. 10th.

P.S. Since my letter was written accounts have been received from the United States, which are considered of great importance in the question of supply from that quarter. It appears that the aggregate quantity received at New York, from the time of the breaking-up of the ice in the spring to the closing of the canals again, for the two past years is as follows:—

	1852.	1853.
Wheat bush.	6,600,000	8,500,000
Flour brls.	3,450,000	3,050,000
Indian corn . . bush.	5,300,000	3,200,000

Of this latter quantity the following have been the exports:—

1853.	
Wheat bush.	6,500,000
Flour brls.	1,800,000
Indian corn bush.	800,000

The stock of wheat and flour in New York was estimated as follows:—

Wheat bush.	250,000 to 300,000
Flour brls.	200,000 to 300,000

The consumption of flour in New York is 5,000 barrels per diem; which, reckoning four months for the period of the frost, will give a consumption of 600,000 barrels. A good deal of flour will probably be received from the southern states by railway; but it is evident that until the opening of the canals we must not expect much more flour from thence. I regret to add, that two large vessels, the "Great Republic" and the "Joseph Walker," having 30,000 bushels of wheat, 40,000 bushels of Indian corn, and 6,600 barrels of flour, all destined for Liverpool, were burnt in dock to the water's edge, together with a warehouse containing from 2,000 to 3,000 barrels of flour. S. C.

IRISH AGRICULTURAL PRODUCE FOR 1852.

A large and eminently useful report has just issued from the Census Commissioners, detailing the returns of agricultural produce in the year 1852. The report, which is addressed to the Lord-Lieutenant, is divided into two main branches—crops and stock; and on each the information is abundant and interesting, as witness the following extracts from the prefatory remarks to the returns:—

"May it please your Excellency,—In obedience to the commands of the Earl of Eglinton and Winton, communicated by Lord Naas's letter of the 23rd of August, 1852, that the returns of agricultural produce in Ireland for that year should be procured in the same manner as heretofore, we beg to lay before your Excellency the following returns of the number of holdings, extent of cultivation, and quantity of stock in each county, barony, and Poor Law union which, as in former years, have been collected by the efficient aid of the constabulary and metropolitan police on printed forms, and in pursuance of instructions supplied to them. To these have now, for the first time, been added returns showing the number of mills employed in scutching flax, and the exact locality of each.

"PART I.—CROPS.

"The entire number of holdings in 1852 exceeding one acre in extent was 554,413, being a decrease on the number in 1851 of 15,925—equal to 2 8-10ths per cent. This decrease extends, in different proportions, over every county, with the exception of Limerick, in which the holdings have increased from 15,206 to 15,291.

"The counties shewing the smallest diminution in the number of holdings are Dublin, Kildare, Cork, Antrim, Armagh, Cavan, and Donegal, in all of which the decrease is under 2 per cent. The greatest decrease is in Westmeath, King's County, Tipperary, and Mayo; in these it exceeds 4 per cent. The number of cottier tenements, or holdings which do not exceed one acre in extent, have diminished in 24 counties by 3,112, and have increased in seven counties by 442, the total decrease in the number of this class being 2,670. The counties showing an increase are Donegal, 14; Down, 30; King's County, 84; Louth, 77; Mayo, 34; Roscommon, 34; Waterford, 158; and Westmeath, 11.

"This being the second year in which a more detailed classification as to the size of holdings was adopted, a com-

parison between the number in each class in 1851 and 1852 is interesting.

"It is seen by the table that the decrease in the number of holdings between 1851 and 1852 is confined to the classes not exceeding 50 acres, viz.:—

In holdings not exceeding 1 acre in extent the decrease is	2,670
In holdings above 1 and not exceeding 5 acres, the decrease is	6,522
In holdings above 5 and not exceeding 15 acres, the decrease is	6,522
In holdings above 15 and not exceeding 30 acres, the decrease is	2,175
In holdings above 30 and not exceeding 50 acres, the decrease is	14

"Whereas the increase in the number of holdings is found exclusively in the larger classes, viz.:—

In holdings above 50 and not exceeding 100 acres, the increase is	1,449
In holdings above 100 and not exceeding 200 acres, the increase is	633
In holdings above 200 and not exceeding 500 acres, the increase is	197
In holdings above 500 acres the increase is	3

"The entire extent of land under crop in 1852 was found to be 5,739,214 acres, being 119,737 acres less than that in 1851. The year 1852 is the first since 1847 (when these inquiries commenced) in which a diminished extent under cultivation, in comparison with the preceding year, has been observed.

"It appears by the table that the extent of almost every description of crop has undergone important changes in the past year, the wheat crop, notwithstanding the reduction of 239,623 acres between 1847 and 1851, underwent a further decrease between 1851 and 1852 of 150,682 acres, being nearly 30 per cent. on the crop of 1851. There was a falling off also in barley of 33,141 acres; in bere, of 12,414 acres; in rye, of 6,704 acres; in beans, of 4,911 acres; in peas, of 8,617 acres; oats, however, increased by 93,674 acres; the entire reduction in white crops being 122,795 acres. Turnips were less in extent in 1852 than in 1851 by 26,758 acres; cabbage, by 510 acres; vetches, by 3,007 acres; and other green crops, by 1,163 acres. Potatoes, however, increased by 8,031 acres, mangel wrazel, by 4,983 acres; beetroot, by 196 acres, and carrots, by 1,431 acres; making the total decrease in green

crops 16,832 acres. Flax fell off within the same period 3,528 acres; and rape, 887 acres; while meadow land has increased by 24,305 acres.

"The table gives the names of the counties in which a decrease has taken place in the quantity of cultivated land, also the extent of the decrease comparing the returns of 1851 with 1852.

"From these tables it is seen that of the eight counties which still maintain an increasing extent of cultivation, six are maritime, and that four of these, viz., Donegal, Mayo, Galway, and Clare, whose united area exceeds 5,000,000 acres, are usually considered as among the poorest districts in Ireland. It will, therefore, be interesting to examine more closely the nature and extent of the alterations in the crops cultivated in these four counties.

"The cereal crops increased in Donegal by 3,540 acres, and in Mayo by 1,543, and decreased in Galway by 1,577, and in Clare by 3,028. In each of these counties there was an increase in the extent of potatoes, viz.:—in Donegal, 2,899 acres; in Mayo, 4,407; in Galway, 3,139; and in Clare, 4,673. Turnips have as generally decreased, viz.:—in Donegal, 1,410 acres; in Mayo, 2,533; in Galway, 1,756; and in Clare, 1,255. The extent of meadow land has increased in Donegal, 4,453 acres; in Galway, 3,850; and in Clare, 6,069; but in Mayo it has decreased 1,129 acres. Thus, in these four western counties there has been an increase of 502 acres of corn; 15,118 acres of potatoes; and 13,183 acres of meadow, while there has been a decrease in turnips and other green crops of 7,349 acres, and in flax, 650 acres.

"The reduction in the extent of land under corn, beans, and peas, in 1852, when compared with 1851, was 122,795 acres; but, notwithstanding this decrease, the amount of produce from these crops in 1852, taken together, was 15,882 tons above that of 1851. This increase is in part owing to the improved rates of produce, but chiefly to the greater breadth of oats sown in 1852. The total increase in the produce of oats was 1,505,971 barrels. The gross produce of wheat was 570,022 barrels less in 1852, than 1851; barley, 213,221 barrels; bere, 85,214 barrels; rye, 54,947 barrels; beans, 127,365 bushels; and peas, 189,647 bushels.

"The extent of land under potatoes in 1852 exceeded that in 1851 by 8,081 acres; but, notwithstanding this increase of cultivation, the produce was less by 1,645,279 barrels. There was also a reduction in the produce of turnips, amounting to 405,429 tons; in parsnips, of 676 tons; in vetches, 7,182 tons; and in rape, of 5,612 barrels; but in these latter cases that result arose from their diminished cultivation. Mangel wurzel shows an increase of 90,904 tons; cabbage, of 3,058 tons; beet root, of 1,350 tons; carrots, of 17,781 tons; and flax, of 256,228 stones.

"The produce tables give the proportions between the total quantity of cereal crops and the population in each county and poor-law union, and similar proportions are given for the potato crop. The greatest amount of cereal crops to each inhabitant was produced in the counties of Meath, Wexford, Kildare, Louth, Queen's, and Kilkenny. The counties of Kerry, Leitrim, Mayo, Sligo, Roscommon, and Clare exhibit the lowest averages. The following table shows the average produce per head of cereal crops in each of these counties:—

	Highest.	lbs.	per	Lowest.	lbs
Meath—produce per head	—	1,601	—	Clare—produce per head	640
Wexford	—	1,375	—	Roscommon	—
Kildare	—	1,333	—	Sligo	—
Louth	—	1,109	—	Mayo	—
Queen's	—	1,104	—	Leitrim	—
Kilkenny	—	1,098	—	Kerry	—
					327

"In 1851 Westmeath occupied a place in the highest class; in this year it has given way to the Queen's County. The county of Galway is no longer in the lowest class; its place has been taken by Roscommon. This does not arise from the latter having deteriorated in its cultivation, but that it has not improved in the same proportion as other counties.

"Of the undermentioned twenty poor-law unions, ten have been selected to show which produce the highest proportion of cereal crops for each inhabitant, and ten whose proportions are the lowest:—

	Highest.	lbs.	Lowest.	lbs.
Dunshaughlin — produce per head	—	2,103	Bantry — produce per head	310
Athy	—	1,885	Killarney	—
Castletown-delvin	—	1,596	Dingle	—
Emisorthy	—	1,576	Galway	—
Ardee	—	1,559	Oughterard	—
Downpatrick	—	1,489	Skull	—
Gorey	—	1,486	Caherciveen	—
Navan	—	1,422	Clifden	—
Balrothery	—	1,362	Kenmare	—
Croom	—	1,358	Castletown (Cork)	—
				94

"It is remarkable how very little alteration appears in this list when compared with that of 1851. The highest class contains the same unions as in 1851, with the exception of Kells, which has given way to Croom Union; and the lowest class is also the same, with the exception of the unions of Glenties and Newport, which have disappeared from this list, and their places have been supplied by Oughterard and Killarney.

"Returns of agricultural statistics for the counties of Roxburgh, Haddington, and Sutherland have been lately printed by order of the House of Commons. The following is a comparison between these and the Irish returns, so far as the different classifications of crops adopted in each would seem to admit.

"According to the returns for these three Scotch counties the total extent under wheat, barley, rye, oats, beans, and peas was 110,651 acres; under potatoes, turnips, and other green crops, 52,205 acres; 'alternate grasses,' 'improved permanent grass enclosures,' and 'irrigated meadows,' amounted to 109,137 acres; the entire making 271,993 acres. The three numbers give respectively 40 7-10ths, 19 9-10ths, and 40 1-10th per cent. on the entire extent under crop; and these rates, it will be seen, approximate nearly to the relative proportions on the class of holdings from 200 to 500 acres in the foregoing table:—viz., 39 4-10ths, 16 9-10ths, and 41 9-10ths; the proportion of the cereal crops being almost equal; the green crops in Scotland exceed those in Ireland by 2 3-10ths per cent., and the meadow lands in Ireland appear to exceed those in Scotland by 1 8-10ths per cent.

"The extent of flax in Ireland in 1852 was 137,008 acres, being 3,528 less than in 1851. The decrease is observable throughout every county, with the exception of Armagh, Down, Tyrone, Louth, King's County, and Kerry. In Armagh, Down, and Louth there was a considerable increase. In the King's County, the increase was 56 acres, while in Kerry it was only two. The want of scutching mills has no doubt checked the cultivation of flax in many districts, but this cannot have been the cause which led to its reduced extent in the counties of Antrim and Londonderry. In the latter the falling off was 1,322 acres, equal to 7 per cent. on the crop of 1851, and in the former it was 2,594 acres, or 21 per cent. on the crop of that year.

"It was observed that the weather at the usual period for sowing flax in 1852 was very unfavourable for the heavier kinds of soil, and in this way the falling off in some districts may be accounted for; but the complaints in 1851 of the want of markets in many localities, together with the deficiency of scutching mills, led persons conversant with the subject to expect a reduction in the breadth of flax in 1852, compared with 1851, independent of the state of the weather.

"According to the returns received, the average rate of produce of flax in 1852 was 41.4 stones per acre, being an increase of 2.8 stones per acre on the rate of produce of the preceding year; this improvement in the crop of 1852 more than compensated for diminished area cultivated, the total produce in 1852 exceeding that in 1851 by 1,601 tons.

"The great desire to extend the cultivation of flax has led to inquiries, for the first time, as to the number of scutching mills; the result shows that there were 956 mills of this description in Ireland in 1852—of which 19 were in Leinster, 15 in Munster, 6 in Connaught, and 916 in Ulster.

"PART II.—STOCK.

"The returns of 1852 show an increase in the number of stock of all descriptions over those of 1851, with the exception of mules and pigs.

"The number of horses two years old and upwards have

decreased by 5,033; but the increase of those under that age is 8,415, which leaves a total increase of 3,382. Cattle and sheep of all ages have increased; cattle by 127,066, and sheep by 491,815. Pigs under one year old have fallen off by 50,710; whereas the increase in those above one year is only 38,511, leaving a total decrease of 12,199. Table VIII., at page 85 of the Summary Tables, gives the details, by counties, or each year from 1847 to 1852.

"The following table shows the number of each description of stock in Ireland in 1851 and 1852:—

	1851.	1852.
Horses and mules	543,312	542,900
Asses	136,981	144,120
Cattle	2,967,461	3,095,067
Sheep	2,122,128	2,603,943
Pigs	1,084,857	1,072,638
Goats	235,313	278,444
Poultry	7,470,654	8,175,934

"The market value of stock has continued to increase since our report for 1851, and if that of the existing stock was computed at the present prices, the total would no doubt greatly exceed the amount shown in the table; but, not being in possession of sufficient data to guide us in assuming average rates according to present prices, and the adoption of those used since 1841 enabling us to reduce the stock at each subsequent period to one common quantity, the former rates are adhered to in the calculations, which give us the net increase between 1851 and 1852, £1,416,836.

"The total value of stock in Ireland in 1841, at the assumed rates, was £21,105,808; in 1852, it was £29,154,229 at the same rates; being an increase of £8,048,421, equal to £38 per cent. on the entire country, in the course of 11 years. In Leinster the increase has been £28 per cent.; in Munster, £33 per cent.; in Connaught, £43 per cent.; and in Ulster, £52 per cent.

"The quantity of stock in the hands of persons whose holdings do not exceed one acre, and of those not occupying land, has increased between 1851 and 1852, the amount of the increase being equal to £41,293. The following is an abstract of the value of stock in the possession of this class of proprietors at different periods—viz.:

In 1841.....	£1,705,965	In 1850	£435,283
In 1847.....	460,735	In 1851	411,243
In 1849.....	473,950	In 1852	452,536

"It appears that in 1841 the average value of stock per holding was as follows: On holdings above 1 and not exceeding 5 acres, £9 17s. 6d.; on holdings above 5 and not exceeding 15 acres, £22 11s. 7d.; on holdings above 15 and not exceeding 30 acres, £16 8s. 7d.; and on all holdings above 30 acres, £14 16s. 1d. By taking the number of holdings in 1852, and calculating at those rates, the total value of stock in Ireland, on holdings above 1 acre, ought to be £33,003,439, which shows that a further increase in stock, equal to £1,301,746, is required to place the holdings of 1852 in the same condition with respect to their stock as similar classes in 1841.

"In conclusion, it affords us much satisfaction to offer our respectful congratulations to your Excellency upon the progress of agricultural improvement in Ireland, which we think is evidenced by the foregoing returns.

"We have the honour to be, your Excellency's very obedient servants,

"WILLIAM DONNELLY, } Chief Commissioner.
Registrar-General, }

"WILLIAM R. WILDE, Assistant-Commissioner.

"EDWARD SINGLETON, Secretary.

"Census Office, 5, Henrietta street, Dublin,
Nov. 28, 1853."

ANNUAL REPORT OF THE LINSEED TRADE.

SIR,—The commencement of a New Year gives us again the opportunity of furnishing you with our annual statement of imports, and remarks on the course of the trade, &c., and we are very glad to have it in our power to congratulate you on its healthy condition of late. The quantity of seed crushed in the United Kingdom increases annually, as you will observe by the following statistical returns; and we trust the profit attending its working has likewise increased to a proportionate degree.

LINSEED is the largest import ever known, and the aggregate will be found, when the annual official accounts are completed, to amount to a million quarters. We cannot help at once calling your attention to this extraordinary quantity, and the range of prices during the last six months; for, notwithstanding the overwhelming importation, it has attained a value not known before for many years.

The sources of supply to this port are materially altered from the previous year; the East Indies showing a decrease of 50,000 qrs., Archangel an increase of about 20,000 qrs.; and Baltic, Mediterranean, and Black Seas of about 10,000 qrs. each. The respective quantities stand as follows:—Mediterranean and sundries, 14,000 qrs.; Archangel, 27,000 qrs.; St. Petersburg, 30,000 qrs.; East Indies, 100,000 qrs.; Black Sea, 70,000 qrs.

During the season there were shipped from St. Petersburg 190,000 qrs. to this country, and 65,000 qrs. to various continental ports; from Riga 90,000 qrs. of crushing, and 35,000 qrs. of sowing seed; and 70,000 qrs. of the former and 50,000 qrs. of the latter to foreign places. The East Indies supplied us with 135,000 qrs. during the year, one-third of which came from Bombay; Archangel 60,000 qrs.; Holland and Belgium likewise took 22,000 qrs. from thence. The Alexandrian exports were very scanty, whilst the Lower Baltic ports' supply was a very liberal one. The total from the Black Sea and sea of Azov (including cargoes already arrived at Falmouth), amounted to 630,000 qrs., which discharged as under:—

	Qrs.		Qrs.
Hull.....	175,000	Dover	6,000
London	70,000	Lowestoft	5,500
Grimsby	32,000	Leith	5,500
Southampton	30,000	Dublin	5,000
Liverpool.....	29,000	Lynn	5,000
Yarmouth	24,000	Rochester	2,000
Newcastle	10,000	Belgium	150,000
Ipswich.....	10,000	Holland	50,000
Gloucester	6,000	France.....	15,000

The comparative imports into the United Kingdom for the last five years, from January to December, have been as follows, namely:—

	Qrs.
1849.....	626,495
1850.....	608,986
1851.....	630,471
1852.....	796,561
1853	about 1,000,000

From 1st July to 30th of June following they stood thus:—

	Qrs.
1848-9.....	700,000
1849-50	600,000
1850-1.....	700,000
1851-2.....	700,000
1852-3.....	825,000

whilst for the first half only of 1853-4 they are already about 700,000 qrs.! About 55,000 qrs. were re-exported last year to various Dutch, French, and Belgian ports—a quantity nearly double that of 1852.

The year opened with a very dull market, at 52s. for Black Sea seed; and crushers having just before supplied themselves liberally in anticipation of higher rates, were indisposed to increase their stocks—so that this price was with difficulty maintained. At the end of January we had fallen to 51s., and

there was then every symptom of a further decline. A very active demand for oil at advancing rates suddenly occurring, and the outport buyers at this time likewise drawing their supplies from us, checked the fall, and we recovered to 52s. by the middle of February. The rise in oil was, however, but very temporary; and, on declining, it dragged seed down with it—so that 50s. was an extreme price early in March. The value of cakes had likewise declined, and in consequence the price of seed went steadily down to 47s. by the end of April, a few forced sales having been made at even lower rates. Throughout the month of May we had to quote a "slow" trade, and the nominal quotation, in the absence of any supplies of moment, was 46s. 6d. to 46s. Since that period, however, our market, even in the face of such enormous supplies, has been constantly on the advance. In June it was influenced by the first rumours of political difficulties in the East, and had advanced about 1s. per qr.; and in July the altered aspect of the corn trade induced the Greek houses (*again* this year) to buy back several of the cargoes contracted for many months previously, the high rates for wheat rendering it a very profitable operation for them to pay a forfeit of 2s. or 3s. per qr., and thereby give themselves the opportunity of shipping that article by the vessels originally intended for seed. Thus stimulated, the price ran up quickly to 49s. and 49s. 6d., but very heavy arrivals drove it back again to 48s. within the same month; and even at this price crushers bought reluctantly. In August we had still a flat market, which continental buyers took advantage of to buy largely on; and not only did they secure all the available floating cargoes, but they likewise purchased and transhipped from hence nearly 30,000 qrs., at a cost of 48s. to 48s. 6d., ex ship. The result we have had frequently to remark upon followed; and when in September our town crushers were wanting seed, it was found scarce, and it again reached the value which it marked at the opening of the year, namely, 52s. The increasing risk of war, and higher rates for all descriptions of corn, with the extreme rates of freight following thereon, still further improved the value in October, when it was steady at 53s. (55s. and 56s. being in vain offered for distant shipments). During November there was but little alteration, except at the end of the month, when 54s. was freely paid, and cargoes off the coast commanded 55s. to 56s. for out-port delivery. The market then again quieted, and in the middle of last month 53s. was accepted to clear the ships and avoid landing expenses. The very limited quantity since offered has again improved the price to 54s., and the little in first hands on the way is held for a further 2s. to 3s. advance.

The quality of the seed has been very various. Archangel, the worst seen for several seasons; Riga, likewise much mixed, and very indifferent; St. Petersburg, of the better sorts, very satisfactory, but the inferior qualities equally otherwise. Calcutta seed hardly maintained its former reputation; Bombay, on the other hand, is highly spoken of. Some of the Black Sea cargoes (especially the earlier arrivals) were very good, but lately the condition has been bad, and the quality has suffered in consequence.

In granary we have about 23,000 qrs., consisting of 12,000 qrs. of Archangel, 9,000 qrs. of St. Petersburg, 6,000 qrs. of Black Sea, and 5,000 qrs. of East India and sundries, which is held entirely by importers. Now afloat, for the United Kingdom, we have 65,000 qrs., say, of Black Sea 29,000 qrs., East India 30,000 qrs., Alexandria and sundries, including some Baltic and two or three very late Archangel ships, 6,000 qrs. For the continent direct the quantity does not exceed 20,000 qrs.

As regards the last crops, the Archangel is well spoken of, being fair in quantity and of fine quality. Of the Baltic seed, either Petersburg or Riga, very little has been ascertained, in the absence of any purchases for future delivery; the same may be said of the south of Russia. But it is reported, however, that in the latter districts the quantity is undoubtedly short; and with a bad harvest the grain also generally suffers.

For next season's shipment we have not heard of a transaction either from the south or north of Russia. In the present political uncertainty as respects our relations with the subjects of that state, English merchants have not dared to make their ordinary advances of hand money to the dealers for up-country purchases during the winter, and the probability therefore is, that much of last harvest's seed will remain unshipped in the absence of the usual arrangements for its conveyance down to the

various places of shipment on the breaking up of the ice. The very high rates of freight also have operated very much against forward sales; and, as all the earlier tonnage will certainly be used for wheat and other grain, the ensuing season must present a great contrast to those of the last few years, when large shipments took place as soon as the navigation opened, in fulfilment of contracts made at even an earlier period than now. This brings to our consideration the question of the probable future supply, both for our wants this season as well as those of next autumn. With reference to which, the late excessive arrivals must bear a prominent place in our remembrance, for there is now a very different consumption of seed in this country, owing to the increased mill-power named in our last annual circular; and the imports of former years bear no comparison to our present requirements. In first hands—in granary and floating we have 200,000 qrs. (which includes Hull, where merchants' stocks are said to be 100,000 qrs.), or a out two months' consumption; after which, turn where you will, we have no encouragement to expect any seed for a length of time, for the Russian ports are all closed, and the high rates of freight in India effectually bar shipments of any magnitude thence.

Doubtless many of the crushers are well stocked; but this year fewer facilities than usual presented themselves to enable them to provide all they required; and, as we fully believe the demand for oil and cake will continue without being checked, even if prices are put up to meet the increased cost of production, crushers must still be buyers; and the absence of sufficient supply will further enhance the value. Besides this, some anxiety will naturally be felt as regards the future. At this time last year few had not secured a portion for their following autumn's work, and could afford to clear out at the end of the season; but should the present uncertainty continue, who will venture to do so now, to say nothing of the supplies in any case being much larger than usual?

LINSEED OIL has been unusually steady in price for several months past, which we attribute to its greatly increased production, keeping a large and regular supply constantly on the market. We had a very active trade in it in January at £30 to £31, which latter was also February's opening rate, when it immediately rose to £33, but afterwards receded to £32 before the month closed. The rise was caused by a very great demand for the American market, followed by the operations (both on the spot and for future monthly deliveries) of speculators, who went deeply into the article when it became known so large a quantity had been taken for actual exportation, and the advices from the United States bringing simultaneous accounts of a rapid rise there. An amount of business, probably never equalled before, was transacted within one week, and a further rise was confidently looked for. Instead, however, of the better accounts anticipated from the other side, each successive mail brought news of a falling market; and to such an extent was the price influenced here, that we had quite a panic, and it receded to 28l. 10s. before the end of March. A slight rally then ensued, but so completely had the speculation failed, holders lost all courage, and forced sales were made as low as 27l. 10s. early in April, involving the loss of very large sums of money to the early spring buyers. After this period the trade was left more to its own legitimate course of demand and supply, and but little, if at all, acted upon by speculative operations. Towards the end of April about 28l. was the value, and a healthy trade all through May and June, at the same price, varying only 5s. to 10s. per ton (up or down), as more or less oil happened to come on the market in any one week. In July and August (during the usual closing of the mills) we advanced to about 29l. 10s., but lost the advance when their work recommenced in September. The warlike appearance of the Turkish question, and advance in seed, however, at this time had its effect, and at the close of that month we were up to 31l., with a very large business doing likewise for delivery this year at 32l. The tightness of money and immense production, however, again caused a reaction to 30l. in October, and to 29l. in November. A slight improvement took place early last month, caused by extensive export orders for the Mediterranean; which were no sooner filled, however, than the market relapsed to 29l. Within the last few days, however, the tone of the market has undergone a great change; the low prices having attracted attention, some large parcels have been taken off the market to store, and already we are feeling the effect; for oil on the spot cannot

to-day be bought under 31*l.*, nor for future delivery under 33*l.* The stocks must be small, for, at its relative value to all other oils, the uses to which it is put are greatly increased, and the export is again larger this year, having been about 17,000 tons, or an excess of 2,000 tons over 1852.

We have great confidence in prices being sustained, as well on account of the increased cost of production, as of the immense consumption going on; and so wide is the present margin between it and other oils, we do not think the consumption would be materially interfered with, even if a considerable rise should take place.

LINSEED CAKES call for little more comment than a register of price. The import of foreign has been unusually small, nearly one-fourth less than last year, and the high freights now paying are likely still further to diminish the supply. It will probably be noticed with surprise the present value scarcely exceeds that of the autumn of 1852, with wheat and all descriptions of grain so much higher, and with meat likewise, for the fattening of which it is so pre-eminently calculated, at a correspondingly increased price. Fortunately we have had, until now, a very ample supply of linseed; but when that diminishes (as it will), we shall soon see the prices assimilating a little more to the value of other feeding stuffs and provender, and, we may add, likewise to its present cost of production. In January, we had a slow trade, at something under 10*l.* per ton; but a very large and steady consumption was subsequently kept up during the remainder of the season, through a judicious reduction in price by the crushers. In February, we had to quote it 9*l.* 10*s.* to 9*l.*; March, 9*l.* to 8*l.* 15*s.*; and in April, 8*l.* 10*s.* down to 8*l.* 5*s.* At the close of the season, in May, it was easily purchasable at 8*l.*, and with the prospect of an enormous supply of seed, at a moderate price, seemed likely to remain at or about that value, at any rate until the period of consumption arrived. The altered aspect of the corn market at this period, however, fostered speculation in it, and many were the inquiries for parcels to hold over, and much anxiety evinced to purchase for future delivery: the consequence was, prices recovered to 9*l.* during July and August, and as soon as the time of active consumption arrived, they further advanced to 10*l.* and 10*l.* 10*s.*; the price at the country mills being even somewhat higher than this. The demand has been by no means checked by the advanced rates, but appears to be going on steadily increasing, and, with the prospect of a severe winter, we shall be greatly disappointed if we have not a rise in prices. The middle of October saw the highest rates paid; after which, although the difference was hardly quotable, they rather gave way—a circumstance by no means unusual at the close of the year; the last day or two, however, has brought a greatly increased demand, and 10*l.* 10*s.* freely paid, with strong indications of a further improvement.

RAPE AND OTHER OIL SEEDS.—The majority of the holders withdrawing their stocks from the market, in anticipation of a deficiency in the supply, caused a sudden rise in Calcutta rapeseed during the month of January, from 44*s.* to 50*s.*, which was well sustained during the first three months of last year; owing to the unremunerative price of oil, however, the value afterwards dropped steadily to 45*s.* by the end of May. During June 46*s.* to 47*s.* were the current prices, with some anxiety to get into stock; but being held firmly, and unfavourable reports existing of the growing crops on the continent, very little changed hands at these low rates. The enhancing value of oil put prices up to 49*s.* in July, and to 50*s.* and 51*s.* in August. By this time the deficiency in the growth having become a certainty, and the comparatively short import, added to the fact that the greater part even of those arrivals were for re-export, sent us rapidly up to 55*s.* and 56*s.* during the month of September, from which we have had no reaction, nor are we likely, should oil maintain its present value. The total imports, you will observe, are only 70,000 qrs., out of which 28,000 qrs. have been transhipped. The stock in granary is very light, only about 8,500 qrs., whilst the quantity on the way does not exceed 14,000 qrs., and crushers hold very little, so that it looks like a further rise, and possibly to a price we have not before seen for Calcutta rapeseed. The values of other East India Oil Seeds stand thus:—Poppy, 54*s.*; Gingelly, 57*s.*; Teel and Sessame, 55*s.* to 58*s.*; Niger, 50*s.*; each of them being considerably beyond the quoted prices twelve months since. The price of Rapeseed to-day is 58*s.*, for the best quality.

RAPE OIL calls for special notice, the new "Moderator" lamp being now so generally used as immensely to increase the consumption; and supply in future will mainly regulate the value. It has become an article also of extensive speculation, and the frequent fluctuations in it may be attributed to this cause. An excellent demand in January put the price for best refined oil from 37*l.* up to 39*l.*, which continued the current price until the end of March, when speculative inquiry improved it to 39*l.* 10*s.* The consuming season being over, it now relaxed to 37*l.*, and from that figure gradually down to 35*l.* 10*s.* at the end of April—the fall caused chiefly by holders having over-stood their market. A partial rally took place in May, and it once marked 37*l.*; but a large importation succeeding, and some forced sales by needy speculators, pushed it down to 34*l.* 10*s.* in June. A great reaction followed, and before the end of July it was up to 40*l.*—a rise only checked by parties realizing the handsome profit then obtainable. It was once done at 38*l.* 10*s.* in August, since which we have had almost weekly to quote an improvement in price—to 42*l.* in September and October, 43*l.* 10*s.* in November and last month, a rapid rise up to 48*l.*, the value to-day. Foreign-crushed Oil has generally had an advantage of about 10*s.* per ton over English; and Brown Oil, both English and foreign-crushed, is usually quoted 2*l.* per ton below refined; although occasionally of late the difference has been greater or less, according to the state of the speculative account on "settling days."

There is all reasonable expectation of the price being at least maintained for some months to come, as we shall not get any shipped off during the continuance of the frost on the other side; and even if the ports were open, the relative values do not admit of their sending Oil here.

RAPE CAKES continue to increase in consumption and value, and the constantly advancing rates prove the demand to have been generally in excess of the supply. We have had a shorter import of foreign cakes than formerly, in part caused by the deficiency of the continental crops of seed, but owing also to their increased use at their places of manufacture. £5 per ton was the value in January, from which it improved to 5*l.* 10*s.* in March. A rather large supply of foreign drove prices back to 5*l.* during May, June, and July, since when it has gone on advancing up to 6*l.* 10*s.*, its value to-day. It is in considerable demand at this price to hold over, in anticipation of even higher rates, the article being now an absolute necessity for the agriculturist, and the probable scarcity of seed must cause the make to be further curtailed.

FISH OILS are so much superseded in their use by the various vegetable oils latterly introduced, that the consumption decreases yearly. SPERM OIL marked 86*l.* in January, and rose to 93*l.* in May. It had receded to 86*l.* again in November, but has since improved to nearly 91*l.* PALE SEAL OIL opened at 35*l.* 10*s.*, and continued steady until May, when, through reports of a larger fishery than usual, it dropped to 31*l.*; it recovered quickly to 33*l.* and has since gone up, month by month, until it stands at 40*l.* SOUTHERN OIL: prices have again been nearly nominal, so little is now done in it in this country. We had to quote it 38*l.* last January; this year it is nominally 50*l.* COD OIL has scarcely varied from 34*l.* until last month, when it rose to 37*l.*, and at which price it is steady to-day. Stocks of all descriptions are very light, and prices fully maintained.

SPIRITS OF TURPENTINE has again been subject to great fluctuations; opening firm at 49*s.* in January, and reaching 58*s.* by the end of the month; touching 65*s.* by end of February; but afterwards receding to 57*s.* in March, and to 48*s.* in April. During May, June, and July, it went down gradually until it touched 43*s.*, and in August even less; after which it again marked 61*s.* at the end of September, but has since receded to 54*s.*, at which it is to-day firm.

TALLOW.—The interest this article has excited during the past year has surpassed that of any former period; and the fluctuations have, at the same time, been greater and more frequent. The price improved nearly 2*l.* per ton in January, namely, from 45*l.* to 47*l.*; but, before February came, the advance had been lost, and a decline to 43*l.* 10*s.* followed. It subsequently recovered to 45*l.*; but during March it was dull, at about 44*l.* The proposed removal of the Soap Duty, in April, improved it to 47*l.*, which rise was well maintained during all the spring; and, in the summer, the growing interest attaching to the Turco-Russian question made quite as

much a political as a tallow market of it. It was 49*l.* 10*s.* at the end of June, 53*l.* to 54*l.* early in July, and down to 51*l.* first week in August; the next week it was 53*l.*, and the following 50*l.*; after which the war question drove it rapidly up to 53*l.* by the end of September. During October it was 59*l.*, and in November down at 55*l.* 10*s.*; early in December it rallied to 56*l.* 10*s.*, and afterward declined 1*l.* per ton; and last week, again ran up to 59*l.* 10*s.*; was then a little flatter, but since improved; and to day, is firm at 59*l.* 10*s.* Tallow forward is about as much higher as would pay the cost of holding until the specified time of delivery; and this has been the case throughout the year, except occasionally after a sudden rise on the spot, when it marked 10*s.* to 20*s.* per ton less.

There is no doubt the high price is limiting the consumption, through the substitution of other lower-priced articles

wherever practicable; but, on the other hand, Australia is likely to use what she produces, in lieu of sending nearly all of it to us; and the home supply is anything but satisfactory, so that they would counter-balance each other in their influence on the value; nevertheless, the future course of prices is a question of war or peace, and at present, therefore, entirely a matter of conjecture.

In conclusion, we request you will observe we have not taken the contingency of war at all into account; the probable supplies and demand alone regulating our opinions. Should a war unhappily ensue, all Russian produce would naturally be much enhanced in value—to what extent it is impossible to judge, as many different circumstances would arise to cause prices to alternate almost daily.

EDWARDS AND EASTY.

London, Jan. 2.

ANNUAL REPORT OF THE WOOL TRADE.

LIVERPOOL, Jan. 2.—During the first six months of the past year extraordinary activity prevailed in the wool trade, and stocks of all descriptions at clip-time in May and June were reduced to a lower point than we have ever before known; and the healthy position of the trade gave indication that a higher range of prices was to be expected than we have for some years been accustomed to; subsequent events, however, to a great extent checked the feeling of buoyancy which before existed, and from June till the end of October operations were entered into with great caution, and chiefly to supply immediate requirements; but at the same time there was no very material falling off in the rate of consumption, and, in spite of many adverse causes which still exist, confidence has been rapidly gaining ground during the last two months, and the prospects are highly favourable for a good spring trade. The unsatisfactory state of the Eastern question for the greater part of the year, and the advancing rate of the money market, which acquired more stringency in consequence of the reported deficiency in the harvest both in this country as well as in France and some other parts of the continent, have had an unfavourable influence on business in general; at the same time it is universally admitted that commercial affairs were never on a sounder footing, and the official returns bear ample testimony to the activity that has prevailed in all the staple articles of industry without parallel in the history of the trade of this country. The weather during November and December has been most propitious for seed time, which holds out a good prospect for next harvest; and, in the meantime, in addition to the grain we may receive from other quarters, it is to be hoped that the United States will be able to supply any deficiency that may arise, as the last harvest there is reported to have been very abundant, which the increased means of railway communication with the interior will render more available, and as the United States are by far the best customers we have for all the articles we produce so abundantly, there is no country from whence we could draw supplies of food which would be attended with less embarrassment to commercial affairs. The home trade, notwithstanding the disturbing influences in existence during the latter months, and in addition to those already referred to, the strikes among the operatives, chiefly confined to the cotton and mining districts, has been very prosperous, and the exports have been on a scale truly marvellous, and will probably exceed by 15 per cent. even the previous year, the largest on record; we are happy to notice that woollen manufactures occupy a prominent position, and we shall not be surprised if, when the returns for the year are made up, they show an increase of 20 per cent. There has been a great increase in the import of wool during the past year, notwithstanding which there is no excess of stocks, with some trifling exceptions, and these chiefly of unsaleable kinds. It is worthy of remark the large quantity of bad conditioned and unwashed wool represented in these returns, which cause a material shrinkage, in dirt and grease, and consequently yield considerably less clean wool to the manufacturer. In English wools, so far from any excess of stocks, they are supposed to be less by far than for very many years at the same period; no old clips are left over, as was formerly generally the case, and the

last clip is supposed to have yielded less by 10 per cent. than the previous one. The increase in the number of mills for some years past has been quite out of proportion to the increased growth of wool; and even making full allowance for the partial stoppage of machinery resorted to, we believe that the means of supply (and as regards foreign and colonial, we consider very erroneous opinions prevail) are altogether inadequate to the present rate of consumption; and under the influence of free trade, with the prospect of new markets being opened for our goods, the question is likely, sooner or later, to engage serious attention.

There has been very little demand for wool for export, and the quantity taken for shipment is not within 50 per cent. of the previous year.

AUSTRALIAN.—In our last annual report we expressed some alarm regarding future supplies; fortunately these have not been altogether realized, and, contrary to all expectation, the receipts have come forward more freely than in ordinary years; the quantity still to arrive is unimportant, so that we are now able to form a pretty correct estimate. We have been accustomed to look for a steady annual increase, which must no longer be expected for the future. It is true that the past year's import shows an increase of 7,500 bales, but it is necessary to notice that a large quantity was detained in the colonies for want of shipping, and would otherwise have appeared in the import of the previous year: taking this into account, we believe there has rather been a falling off last year than any increase. The clip was secured at great extra expense and personal anxiety to the growers from the scarcity of labour at the time of shearing; it can therefore create no surprise that it has proved the worst that has been received for years, the want of attention having been apparent in many of the flocks, the condition has been generally bad, and the quantity of unwashed unusually large. We can, however, hardly suppose that the prices obtained will prove satisfactory to the colonists, and we happen to know that some of the wools sold at the last London sales cost on the other side 4*d.* per lb. more than was realized. It must be confessed that the future prospects for wool from these colonies are far from assuring. The report of the existence of scab throughout most of the districts of Victoria, which reached us some months ago, are fully confirmed by the latest accounts; this scourge to the flocks seems to be rapidly spreading, and, from the want of labour and needful attention, it seems hopeless to expect that it can be checked; one diseased sheep will spread the contagion among a whole flock, and the infection remains even in the land for some time after the sheep have left it; the consequence is not only a considerable loss in the weight of the fleece, but the healthiness of the wool is much impaired. They are now generally smearing the sheep with arsenic, and it remains to be seen whether this will have any injurious effect upon the wool. Under any circumstance we must be prepared for a still further serious retrogradation in the flocks, as it has now reached that point when the carcass is more regarded as a source of profit than the wool; we know this to be the case among holders of even fine flocks; we fear, therefore, that although a marked advance in prices should take place, it would not now remedy the evil.

Besides which, cattle, as they require less attention than sheep, are more to be relied upon to supply the rapidly increasing demand for meat, which will necessarily encroach on the sheep pasture. In other respects the condition of the colonies is highly prosperous: the yield of gold seems likely to be greater than ever, and an enormous outlet is opened for our goods, not merely to be estimated by the extent of the population, great as the increase has been; but money being easily acquired, the rate of consumption of necessaries, and even luxuries, becomes greatly stimulated. The shipments from this country have been on a very extensive scale, and, in addition to the large sum of gold sent out, have had some effect on the money market, but without producing the derangement in commercial affairs which was by many predicted; the returns are now beginning to flow back, and the exchange no longer favours shipments of gold. We believe that goods selected with judgment for those markets, and intrusted to the sale of experienced agents, have left a very profitable return, but many articles have been sent out altogether unsuitable or at any rate only saleable to a limited extent, which will leave severe losses. The latest accounts of the number of ships of all nations in the different Australian ports are testimony of the importance attached to this trade; but of all foreign nations the Americans have taken the largest share: many leading houses in the United States have established branch houses, and we shall not be surprised if they become formidable competitors for wool next season. Few return cargoes have come to Liverpool; however, in the outward trade we occupy a leading position, the amount of goods shipped being equal to London, but the number of passengers has been greater, while the rates of freight and passage money have been much less; and as to the superiority of our ships in the trade, it is only necessary to refer to the voyages they have performed, some of which have been the shortest on record.

CAPE OF GOOD HOPE wools do not offer any cause for congratulation. The greater part are still sent home in lamentably bad condition, and, consequently, take a very low rank in our market. Such flocks as are got up with care are justly appreciated, but unfortunately these form quite the exception: in general they are so irregular in quality, and mixed with grease, and frequently so full of sand as to lead to the opinion that it has been intentionally thrown into the wool. These circumstances give them at all times a doubtful value, while in dull markets they are next to unsaleable. It is really surprising that the growers have not yet seen their true interest to establish a reputation for their flocks, but in the present position of affairs in Australia it is more than ever a question for their serious attention.

GERMAN.—This description is now seldom inquired for, and a large portion of the import is for manufacturers' account, who continue to attend the periodical wool fairs, although in diminished numbers; but, while the consumption has been declining in this country, it has been absorbed by the continental demand, and prices have ruled relatively higher than colonial wools. The Germans, Belgians, and French are now regular buyers in our markets, and their purchases at the last colonial wool sales were little short of £200,000.

SPAIN AND PORTUGAL.—Spanish wools have been little sought after, and the receipts have been small, as they could not be imported to compete with the prices of colonial, Lisbon wools: Of the gummy kind but few have been imported, and prices have ruled low; they are generally rather difficult of sale, and particularly when other descriptions are at moderate prices. Clean washed Lisbon, on the contrary, are at all times a desirable at full rates. Oporto has been in fair demand until within the last few months, when long stapled descriptions were affected by the stagnation in English combing wools, but stocks being light, holders were not willing to submit to a reduction in price, and they are now moving off at former rates. Lambs and other low qualities have been more depressed through the decline in East India wools; but they have rallied of late, and nearly everything has been cleared off.

UNITED STATES.—The purchases for this quarter have not been to any extent, and the receipts from thence have comprised chiefly shipments that have been returned, not finding a profitable market. The state of the woollen trade seems in a healthy condition and in many respects resembles our own, having mainly suffered from a stringent money market.

BUENOS AYRES AND RIVER PLATE.—We have again to notice a very large increase in the import far exceed-

ing any previous year. It is gratifying to notice the improvement in some of the principal flocks, which are chiefly consigned on growers' account; these have uniformly met with ready sale, and the prices obtained bear ample testimony that they are justly appreciated, and, as a proof of this, those who have purchased them before are generally prepared to pay the highest market value. We can offer no stronger argument in favour of sending home wools in good condition; such as are defective in this respect are not only much depreciated in value, but generally also of very precarious sale, except at greatly depressed rates. The present stock is chiefly of this kind, and also includes a quantity of good common qualities, which are little in demand. We have received less Cordova than usual: it has been in fair demand, and there is a moderate stock. The last mail from the River Plate reports a very active demand for all kinds of wool, at a very considerable advance on last year's prices, and we expect that our receipts during the present year will show a considerable falling off.

PERUVIAN AND ALPACA.—Alpaca: in the early part of the year an extensive business was done, including a considerable quantity to arrive, and a great portion of the arrivals since have been to complete former contracts. It has for some time been very much neglected; an accumulation of stock has taken place, and prices are at present almost nominal. An attempt has been made to introduce the breed into Australia, several hundred Alpacas having been sent to Sydney; but we do not look for a practical result, and, in addition to other causes, the exportation is almost prohibited, the South American Indian having a strong attachment to the Alpaca. Sheep's wool: The arrivals have not been extensive, having been chiefly sent to the United States, also to Hamburg, whence several thousand ballots have reached us.

EAST INDIA.—The increase from this quarter has been very remarkable. In 1850 the import was under 10,000 bales, while for the last year it has exceeded 35,000, of which more than half has come to Liverpool. Large as the increase has been, it has not exceeded the requirements of the trade, and we are still of the opinion that they will readily take off any quantity that may be sent home. This description is chiefly consumed in the blanket districts, and the activity in this branch of business has exceeded any former period. But, to insure satisfactory prices, it is very essential that shipment should be carefully prepared, avoiding mixture of quality and grease in the same bale and mark, which destroys confidence in the buyers; and we regret to notice that a very large portion of the receipts, for some time past, have been open to these objections.

CHINA.—The receipts are increasing, upwards of 1,000 bales having arrived last year; it promises to become a favourite article, but requires to be got up with more care, which, however, is very excusable in the present early stage of the import.

RUSSIA has contributed largely to our supplies, and the quantity has far exceeded the previous year. The low range of prices of colonial have operated against brook-washed and other finer descriptions. Donskoy fleece has met with pretty ready sale, which has prevented stocks from accumulating; but autumn, for many months past, have been quite neglected, and the supply at present is rather large: the enormously high freights have told with great severity upon these low descriptions; at the present time from the Black Sea freight and insurance are nearly equal to 50 per cent. of the cost on board, which alone would prove a complete barrier to shipments; and in addition to this, there is considerable demand on the spot for Donskoy fleece for army clothing, which must seriously affect future receipts. Under existing circumstances, our trade with that country must be considered in a very uncertain position, and merchants will not venture to send out funds to purchase on contract for distant delivery, as in former years. The withdrawal of a vast amount of capital must necessarily cripple their trade, and may tend to make the war unpopular, as both the peasant and the noble are dependent on the export demand for their produce.

MEDITERRANEAN has been greatly in excess of former years, comprising a large proportion of Bengasi and other most inferior descriptions, of which there is now a great accumulation of stock, and sales can only be made at very depressed rates. On the other hand, all current descriptions have met with fair demand, and are at present a good deal sought after;

but the scarcity of shipping and the greatly enhanced rate of freights will prove a great impediment to shipments and materially add to the cost. The Turkish provinces on the Danube and the surrounding states of Servia, Bosnia, &c., are large wool-growing countries; but being at present the principal seat of war, we must expect that future supplies will be diminished even to a greater extent than during the last Hungarian revolution, when in one year the large flocks of Prince Esterhazy were reduced by one-half, and many others in equal or a greater proportion.

EGYPTIAN wool has fallen off very much in quality, not being got up with the same care as formerly, often badly classed and very mixed; good kinds are still much appreciated, which is not the case with such as are irregular and even burry, being unsuitable for combing or carding purposes.

MOHAIR OR TURKEY GOATS' WOOL.—The total receipts show a considerable increase, being upwards of 50 per cent. in excess of the previous year, which may be ascribed to the high prices that have ruled here for some time past, and the manufacture has required a firmer footing in this country, whereby greater stability has been given to prices, which have been well maintained throughout the past year. Attention has been directed to the subject, with the view of introducing the Angora goat into the Cape of Good Hope; and if judiciously carried out, we have every reason to expect it would be attended with complete success, some parts of the colony being peculiarly adapted to the growth of the article, and the consumption might be materially extended, if a regular supply could be depended upon.

MOGADOR WOOLS have been in plentiful supply, but have not met with ready sale, particularly during the latter months; the home trade have been the chief purchasers, and the better descriptions have been most sought after; while inferior, sandy, and bad conditioned wools have been much neglected. Some parcels of Sax wools have been received, got up in superior style, which have met with ready sale at full prices.

ICELAND.—The import has been increasing for some years

past, and on the present occasion we notice a very considerable addition, the result, no doubt, of our market affording better prices and a more certain demand than any other. Early in the season there was a desire to press sales for arrival, which had the effect to depress prices, but sales since made have been at satisfactory rates.

DOMESTIC WOOLS.—At clip-time consumers and dealers being very low in stocks purchased freely, and for some time subsequently sales were made to a considerable extent; but at a later period the anxiety about the harvest, in addition to other causes, induced them to act with great caution, and, until the end of October, the purchases of consumers were confined within the narrowest possible limits, chiefly made from staplers, who were thus enabled to clear off their stocks, although at prices much below what they could be replaced. The quantity remaining in growers' hands is very light for the period of the year, and they seem determined to stand out for extreme prices, and it is the general opinion they never so well able to hold over, as they are getting high prices for all their produce. The demand has chiefly been for bright-haired combing, and also for clothing wools, which have ruled higher than other English descriptions. Irish: The growth is greatly increasing, and the quality is also improving—the home trade have been the principal purchasers, and much less than usual has been taken for French account; there has been an increased inquiry of late, but prices are almost nominal, as wools cannot be obtained from the growers at anything approaching recent quotations. Scotch: Our market has been indifferently supplied, the wools having been chiefly consumed there. Stocks are at present extremely light, and held at high prices, which has induced more inquiry for foreign, and sales to some extent have been made to supply the deficiency. Sheep-skins: Heavy-wooled descriptions have been in fair demand, but the finest qualities, in good condition, have been most sought after, and have brought full prices; there is at present a good deal of inquiry, but very little stock.

HUGHES and RONALD, Wool-brokers.

PLEURO-PNEUMONIA.

SIR,—Allow me, through your columns, to suggest, as under, a remedy and preventive of *pleuro-pneumonia* amongst cattle, in answer to "A Tenant-Farmer, Dingwall, N.B.," in your paper of the 26th inst.

This destructive disease appears to belong to the *putrid* order, and seems to be accompanied by severe depression, and irregular influence or power of the nervous system over the circulation of the blood. The symptoms of illness are unhappily now so well known by stock-masters that it is almost unnecessary to describe them here. The animal affected suddenly stops feeding or ruminating, lags behind the rest of the herd, appears stiff and sore, with a short hard cough, or peculiar *grunt*, on being driven along. In my opinion, however, these symptoms denote that the beast is in the *last* stage of the disease, instead of being at its commencement, and show that it had been in existence for days—nay, weeks—although unobserved and unnoticed.

From the experience which unfortunately I have had in *pleuro*, I am inclined to think that it commences in a torpid action of the liver and dyspeptic state of the stomach and bowels, *ending*, after several weeks' continuance, in inflammation of the lungs, heart, &c.; hence its being in its last stage before any treatment is adopted is a principal reason why it is so extremely difficult to effect a cure. What primarily induces the disease it is impossible to say. One thing, however, seems clear—namely, that when it does break out in a herd, its first victims are those of delicate constitution, or which have been weakened by previous poor feeding, or disease of any other kind. It seems, also, to be peculiarly fatal amongst dairy cows, either giving milk or with calf; and I have seldom or ever seen animals of this class recover

when attacked. Its ravages seem also to be materially assisted in the general stock by bad ventilation in cattle houses, exposure to severe cold or sudden changes of the atmosphere, pasturing and lying continuously on low damp grounds, bad water, over-driving, or irregular and poor feeding during long journeys. *Pleuro* seems at least to have two types—a mild and more severe form. The first is represented by isolated cases in the herd, brought on by chance, as it were, which are usually curable on being promptly treated, and non-infectious on being at once removed away from the general herd. The second, or severer type, is much more serious and intractable, and either comes in the form of an epidemic, seizing on many victims at once, and defying every attempt to cure, or is brought about by carelessness, or want of thought in allowing a few isolated cases in the last stage, or after death, to infect the cow houses, or the rest of the herd to come into contact with subjects of pollution, in some other equally reprehensible way. I am rather inclined to think that it is not infectious in its first stages, or even for a couple of days after the lungs have become affected; but subsequently to this period, and when lymph has begun to form, or structural disease commenced, it is prudent to take every possible care to prevent communication with the rest of the herd. After the appearance of a case or two of *pleuro*, the herd should be closely watched, and the earliest symptoms detected, as in early treatment lies the sole chance of effecting a cure. When a few cases have occurred, showing that it is likely to extend amongst the stock, preventive treatment should be at once adopted, as described below, and the run of the cattle changed if possible.

An attentive observer of a herd in which incipient

pleuro-pneumonia has taken root in the epidemical form, should be able to observe a generally unhealthy appearance about the animals, an irregular method of feeding, a staring of the coat, weeping from the eyes, and short cough for days and weeks before the last stage is reached, or the breathing become affected; and it is during this period that preventive measures should be taken to ensure success. In either case, whether in endeavouring to cure in the advanced stage, or in the adoption of preventive measures, the animal should be taken, if at all possible, to houses or yards entirely free from infection, or where cases had proved fatal to any extent; as any attempt to cure or prevent in infected houses, or in a polluted or vitiated atmosphere, will have a far less chance of being successful.

I have frequently tried the curing of *pleuro-pneumonia* by repeated bleedings, blistering of the sides, the administration of saline purgatives, &c., without any success whatever; and indeed, from experience, can give an opinion that all similar kind of treatment is not only non-effective but positively injurious, and tending to an acceleration of the disease. This experience first led me to try homœopathic treatment, with which I have been invariably successful whenever I have met with cases in the mild type. In one instance, however, of the severer type I have not been so successful in curing, but here again I succeeded by preventive treatment on the homœopathic principle, in fairly stopping its progress. This latter instance I may as well relate.

In 1852 I bought a lot of forty-nine three years old ture heifers, in Balinasloe, for wintering out for the following season's grass. These I trained, so far, on their way home, a distance of about seventy statute miles. From the great demand for accommodation in cattle-boxes at the Balinasloe station, and consequent confusion, the cattle were boxed badly, and put in too throng; consequently were a good deal bruised, heated, and excited on the journey. After coming out of the boxes in this heated state, they had to lie out, being still a good distance from their destination, in a cold chilly night in October, which exposure, after the heating and bruising received on the railway, in my opinion tended to bring on this disease. Shortly after arrival at their pasture, a cough began to prevail amongst them. In about a month one fell ill, which was early noticed, housed, treated, and the disease mastered. In another week a second case was announced, and this one was also housed and finally cured. This second case never became affected in the breathing, yet was very bad; and, after being cured, the skin became quite yellow, showing that the liver had been the principal seat of the disease. In another week two cases happened almost simultaneously. The houses and yard had by this time become infected; and, to make the infection worse, No. 3 died, although shewing no worse than those previously recovered under exactly similar treatment. I then became alarmed, and sold No. 4. Immediately, then, I took forty-three of the remainder of the lot, and treated them preventively. One-half were housed and treated in the infected yard; and of this number I had two cases thereafter, which I had to dispose of. The other half were taken to a yard entirely free from infection, and treated in the open yard, with no cover from the elements whilst under treatment but what shelter they had from the walls of the houses; and of this lot not a single case happened afterwards. I may mention here—as a proof that this lot of cattle had had this disease in their constitution for some time previous to its breaking out—that fifty heifers, bought in a different part of the country and carefully travelled home, had been mixed with them for weeks, and yet in this lot there did not happen a single case of *pleuro*.

Prescriptions for *pleuro-pneumonia* for a full-grown beast:—

3 grains white arsenic,
2 oz. brown sugar.

Give in about a pint of lukewarm water, at intervals of three hours, until four doses have been given. After the administering of the last dose, starve from food and water for thirty-six hours. After the thirty-six hours have expired, feed for the next twenty-four hours *most sparingly* on thin bran mashes, allowing a small quantity of chilled water at intervals. At the end of the twenty-four hours, if the disease does not seem subdued, repeat the above treatment exactly in every respect. Thereafter, if the recovery is protracted or seems doubtful, give occasional doses as above—say one in the morning and another in the evening every second day, feeding *most sparingly* during the time on thin bran mashes, or grass, and allowing small quantities of chilled water two or three times a day. The house in which the beast is should be well ventilated, without any draught or exposure to cold, and the body of the animal, if in winter, should be covered with a woollen rug. After the occupation of a house by a distempred beast, the walls, floor, and ceiling should be carefully and liberally washed over with chloride of lime.

Preventive prescription for a full-grown beast: Bleed from three to four quarts, avoiding frosty weather; give no food or water thereafter. In six or eight hours give 8 grains of white arsenic and 4 oz. of brown sugar in about a pint and a half (imperial measure) of lukewarm water. In six hours repeat the dose, and thereafter starve from food and water for thirty-six hours. First day after the thirty six hours have expired, give limited green feeding and cold water. The second day drive back to pasture or usual feeding. Care should be taken in administering the arsenic, to see that it is all conveyed into the stomach. This can be done in the best manner by rubbing the sugar and the arsenic well together in a mortar previous to diluting it; or, if a mortar is not at hand, the same thing can be accomplished by stirring the arsenic well amongst the sugar before pouring in the water, then shaking the mixture well immediately before pouring it down the animal's throat. Care should also be taken to get the arsenic unadulterated and fresh from a respectable druggist. From knowing the quantity for a full-grown beast, any one acquainted with stock should be able to guess as to the proper doses to give younger animals.

Hoping that the above may be of some service, and desirous that any results from the application may be communicated through your columns,

I am, sir, your obedient servant,

THOMAS ROBERTSON.

Brannoxtown, Newbridge, Dec. 30.

AGRICULTURAL QUERIES.

SIR,—I have upwards of one hundred ewes in lamb affected with the "rot," two of which have been killed, from other causes, having about 15 flukes each in the liver. What is the best medicine and mode of treatment? Any one giving any information on the subject will do a great kindness to one who cannot afford to sustain a serious loss. W. W.

SIR,—Some time ago Mr. Pusey made a comparative statement of the respective merits of the Suffolk Punch and of the Clydesdale cart horses: can any of your readers inform me in what publication it appeared, and at what date? or should this meet the eye of Mr. Pusey, perhaps he will kindly give the required information. Yours, &c.,

Jan. 13.

RUSTICUS.

SIR,—Will any of your correspondents give plan, with dimensions, of a hurdle to allow sheep or lambs to eat clover or tares through? as I wish to try that plan this summer, and by shifting the hurdles every morning, to manure the land equally. S. T.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEATH.	
	in. cts.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	8 a.m.	2 p.m.	10p.m.		
1853-4.	9 a.m.	10p.m.										
Dec.	22	30.05	30.10	32	33	33	N. East	var.	cloudy	cloudy	cloudy	sleet
	23	29.94	29.90	32	37	34	N. East	gen. air	cloudy	cloudy	cloudy	sleet
	24	30.08	30.20	32	36	30½	E., N.E.	gentle	cloudy	cloudy	fine	dry
	25	30.22	30.29	28	32	25	E., N.E.	gentle	fine	sun	fine	dry
	26	30.16	30.10	20	32½	33	N.W., N	gentle	fine	sun	cloudy	snow
	27	30.01	29.98	28	33	30	N. Weste	gentle	fine	sun	cloudy	snow
	28	29.88	30.13	25	31	26	N. Weste	fr. air	fine	cloudy	clear	snow
	29	30.21	30.10	15	27	23	Variable	calm	fine	sun	fine	dry
	30	29.64	29.65	21	35	27½	N.W., N.E.	var.	cloudy	cloudy	fine	rain & slt.
	31	29.65	29.55	24	33	30	W.N.W.	gentle	fine	sun	fine	dry
Jan.	1	29.44	29.44	24	30	27	W.N.W.	gentle	fine	cloudy	fine	snow
	2	29.27	29.30	25	33	18	W. by S., S.W.	air	fine	cloudy	fine	snow
	3	29.30	29.10	14	30	30	Easterly	forcibl.	cloudy	cloudy	cloudy	snow
	4	28.92	28.91	29	32	32	E. or by North	brisk	cloudy	cloudy	cloudy	snow
	5	29.90	28.90	31	33	32	S. East	gentle	cloudy	cloudy	cloudy	snow
	6	29.01	29.10	31	35	34	South by West	gentle	cloudy	sun	fine	rain
	7	29.17	28.90	34	42	41	Southerly	v. brisk	cloudy	cloudy	fine	rain
	8	28.90	29.16	38	45	37	S. West	gentle	cloudy	sun	fine	dry
	9	29.12	29.21	35	40	36	S.E., N.E.	v. calm	cloudy	cloudy	cloudy	dry
	10	29.42	29.63	34	36	36	N. by West	gentle	cloudy	cloudy	cloudy	rain
	11	29.82	29.90	34	36	35	N. by West	gentle	cloudy	cloudy	cloudy	dry
	12	29.88	29.78	33	38	36	S.S.E.	rising	cloudy	cloudy	cloudy	dry
	13	29.68	29.64	37	43	38	Southerly	gentle	cloudy	sun	cloudy	dry
	14	29.64	29.64	34	46	33	Variable	gentle	fine	sun	cloudy	dry
	15	29.66	29.73	32	39	38	Every way	gentle	cloudy	fine	cloudy	rain
	16	29.58	29.90	37	46	46	S.S.E.	gentle	cloudy	cloudy	cloudy	dry
	17	30.61	30.12	43	47	47	S. by West	lively	fine	cloudy	cloudy	dry
	18	30.18	30.16	45	48	42	S. by West	gentle	cloudy	cloudy	cloudy	dry
	19	30.10	29.95	32	43	38	S. East	calm	haze	sun	fine	dry
	20	29.96	30.08	37	48	48	S. West	lively	cloudy	cloudy	cloudy	rain
	21	30.28	30.22	41	49	44	S.E. by W.	gentle	cloudy	sun	fine	dry

ESTIMATED AVERAGES OF JANUARY.

Barometer.			Thermometer.		
High.	Low.	Mean.	High.	Low.	Mean.
30.770	28.770	29.770	52	11	36.5

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
37.07	30.87	34.02

WEATHER AND PHENOMENA.

Dec. 22. Very fitful, hazy, moist. 23. Early, sleet. 24. Keen, becoming frosty. 25. Fine clear Christmas. 26. Pretty fine, thaw. 27. Keen night, after snow. 28. Beautiful forenoon. 29. Sharpest frost. 30. Keen; then rain and snow. 31. Fine day; a mere hint of snow.

LUNATIONS.—Last quarter, 23rd day, 1h. 23m. afternoon. New Moon, 30th day, 6h. 6m. a.m.

Jan. 1. Fine forenoon. 2. Snow, repeatedly. 3. Change of wind, violent from east. 4 and 5. Barely freezing, with rain at times. 6. Thaw and rain, 7. Snow melting, with much rain, 8.

Calm, cheerful day. 9 and 10. Gloomy and damp. 11. Chilly. 12. Fine coloured clouds; changeable and windy. 13. Fine; spring-like. 14. Fine; slight ground frost. 15. Some wet in the night. 16. Damp and chilly. 17. Damp; attempt at drizzling. 18. Damp and gloomy. 19. Fog clearing off. 20. Pleasant forenoon; small rain. 21. Threatening, early morning; fine day.

LUNATIONS.—First quarter, 6th day, 3h. 48m. a.m; full, 14th day, 9h. 11m. a.m.

REMARKS CONNECTED WITH AGRICULTURE. This table will suffice to prove the extraordinary nature of the weather during this period. The immense depth of the snow prevented every approach to, and inspection of, crops. Just, however, at the close of this table, I had opportunity to discover the health of turnip crops remaining on broadlands, the verdure of young wheat, and that of meadow grasses. The winter is assuredly favourable, and we may hope for a much improved prospect.

J. TOWERS.

Croydon.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR
JANUARY.

Notwithstanding the extreme severity of the weather in all parts of England during the early part of the month, our accounts from most quarters are highly satisfactory as regards the position of out-door farm labours. The favourable seed-time experienced last Autumn enabled our farmers to proceed with the sowing of wheat almost without a single day's interruption. This circumstance, added to the rise in prices, together with the prospect of further enhanced rates, tended to give a stimulus to ploughing and sowing; hence, at least two-thirds more wheat land were sown than in the preceding corresponding season; and we learn that preparations are being made in this direction to an extent hitherto unknown in this country. Should, therefore, the two next months prove fine, we may look forward to a large growth of wheat in the present year. We trust that the next crop will be a remunerative one; yet we cannot but lean to the opinion that the arrivals of grain and flour from the United States, during the whole of this and next year, will be on a scale far exceeding our actual wants. Be that as it may, corn will no doubt be dear for several months to come, for the all-important reasons that the home-growers have unusually small supplies on hand, the stocks of foreign produce in warehouse are limited, and consumption is increasing. We need scarcely observe that the wants of the continent will in part be supplied from England; consequently, it is evident that any accumulation of foreign grain or flour here is wholly out of the question. The corn trade has continued less excited, owing to the large quantities of bread-stuffs at hand from the United States; nevertheless, prices have had an upward tendency, with a good consumptive demand. It may be remarked that the various samples of wheat of home-growth, shown at Mark Lane and elsewhere, have not been so deficient either in weight or colour as might have been anticipated from the extremely unfavourable weather at harvest time. Sprouted samples have been met with; but, on the whole, the general condition of the supplies have been well suited for millers' purposes. That the produce of last year's barley crop was unusually large, is evident from the immense quantities of that grain which continue to be disposed of weekly. Up to the present time, fully one-third more has been sold than in the preceding season; yet prices have ranged high—as much as 50s. per qr. having been paid for selected qualities. No doubt, the rise in the quotations of wheat have had considerable influence upon the value of barley. Oats and all other articles have been in request, on higher terms. The future state of the corn trade will, in some measure, be governed by our relations with Russia. In the event of a war with that country, our usual Baltic supplies will be cut off, except

those which may reach us in neutral ships, and it is evident that oats will be selling at a considerable advance upon present rates; indeed, should the Archangel supplies be cut off, it is difficult to understand how consumption will be met at all.

We regret to find that foot-rot amongst sheep has become very prevalent, especially in the counties of Cambridge, Lincoln, and Norfolk. The loss to the graziers must be a most serious one; the deterioration in the value of sheep in Smithfield from the disease in question having already been from 25 to 30 per cent. On the whole, the health of the beasts has continued good, and we may observe that the supply of food has been large, but of very inferior quality. In point of fact, in some localities, much of the hay has proved almost useless, except for littering purposes, arising from the musty state in which it has been cut from the stacks. The stock of winter turnips and carrots has, however, turned out well; and there has been a very large consumption of oil-cake, notwithstanding that the price has advanced fully £1 per ton.

After a period of considerable inactivity, arising in some measure from the various "strikes" in the manufacturing districts, and the immense production of woollen goods in the early part of 1853, which completely glutted the markets, both at home and abroad, the wool trade has exhibited increased firmness. In some instances, English qualities have improved in value; and the quotations of other descriptions have been well supported. The stocks of all kinds are comparatively small. The first series of colonial wool sales will be commenced on the 9th proximo.

The markets for the sale of hay and straw have been well supplied. Prices have exhibited a very large margin. For instance, in the metropolis meadow hay has sold at from £3 to £5 10s.; clover do., £4 to £6 10s.; and straw, £1 12s. to £2 4s. per load. These quotations prove that a large portion of the last crop of hay was secured in very bad condition.

In Ireland and Scotland, considerable fluctuations have taken place in the value of wheat. The tendency has been upwards; but the rise in prices has not been equal to that obtained in England. The shipments of potatoes from both countries have been large, and we understand that the stocks on hand are very large, the time of year considered.

Prices, however, have advanced to some extent, owing to the great demand on English account. Generally speaking the quality of the crop is by no means inferior, although instances have come to our knowledge in which some severe losses have been sustained. In Scotland, the number of beasts on most farms is larger than for a series of years past, and the tempting prices in the south have induced the owners to ship extensively.

The guano trade has been in a most anomalous position. The agents of the Peruvian government, owing to the want of supply, have given notice

that they are unable to supply the public, and further, that they are unwilling to take fresh orders until they have received further advices from Peru. It is stated that the future first price of guano will be considerably advanced, from the great increase in the rates of freight. Up to the present time, all efforts to break through the monopoly in the trade have been unsuccessful; but we trust that those who have commenced the movement will not relax in their efforts to secure for the English farmer so valuable a manure at the lowest possible charge.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although there has been a slight decline in the value of beasts and sheep in Smithfield, arising from the large arrivals of the first-named stock from Scotland, and the immense supplies of dead-meat received up to Newgate and Leadenhall from various distant parts of England, including Scotland, an extensive business has been transacted during the month. Consumption has unquestionably been on the increase, and the future prospects of graziers in general, as respects value, are cheering. Not that we anticipate any material rise in present rates, as the Dutch ports are now re-opening, and we may safely calculate upon a very large increase in the imports of stock from that quarter as the season progresses. In most parts of Holland, the numbers of both beasts and sheep ready for shipment to this country are described as unusually large, and no doubt the tempting prices in our markets will induce the owners to ship extensively, especially as freights continue low.

It would appear, from inquiries instituted in our leading flock districts, that the supplies of sheep on hand are still small; but those of beasts are represented as large. In Scotland, more beasts are now being stall-fed than has ever been recollected; hence it follows that we shall not be in want of beef during the present year; but we regret to learn that foot-rot has made its appearance in almost every county in England, and which has committed sad havoc amongst some of the best flocks. Numbers of rotten sheep have been hurriedly disposed of, at a considerable loss upon prime cost—the owners not being disposed to incur any large outlay for curatives, which, in too many instances, have proved of no avail.

The want of anything like an average supply of good sound hay has increased the expenses of both breeders and feeders, and the high value of lean stock has induced great caution in making large purchases. However, stock-breeding is undoubtedly a most profitable business at this time, when economically conducted. Oilcake has continued to be consumed in large quantities, and the price has advanced quite £1 per ton. The favourable news from Australia, and the comparative firmness in the wool trade, have had considerable influence upon the value of hides and skins; whilst the Eastern war has produced a rapid advance in the price of tallow, which has run up the value of

rough fat to 3s. 5d. per slb. This is the highest quotation paid for many years.

The total supplies of stock shown in Smithfield have been as under:—

	Head.
Beasts	19,687
Cows	510
Sheep	95,080
Calves	887
Pigs	2,279

COMPARISON OF SUPPLIES.

	Jan. 1850.	Jan. 1851.	Jan. 1852.	Jan. 1853.
Beasts ..	15,553	18,310	17,325	20,717
Cows ..	442	361	442	480
Sheep ..	95,560	92,590	102,976	96,800
Calves ..	1,011	1,178	1,336	2,148
Pigs ..	1,783	2,998	2,515	2,360

Annexed are the highest and lowest figures obtained in the course of the month:—

Per 8 lbs. to sink the offals.

	s. d.	s. d.
Beef, from	3 0	4 10
Mutton	3 2	5 4
Veal	3 4	5 6
Pork	3 4	4 10

COMPARISON OF PRICES.

	Jan. 1850.		Jan. 1851.	
	s. d.	s. d.	s. d.	s. d.
Beef from	2 10	4 0	2 6	3 8
Mutton	2 10	4 2	3 4	4 4
Veal	3 0	4 0	3 0	3 10
Pork	3 4	4 2	2 10	4 0
	Jan. 1852.		Jan. 1853.	
	s. d.	s. d.	s. d.	s. d.
Beef from	2 4	3 10	2 6	4 2
Mutton	2 8	4 4	2 6	5 0
Veal	3 0	4 0	3 0	4 8
Pork	2 8	3 10	2 10	3 10

The bullock supplies have been thus derived:—

	Head.
Norfolk and Suffolk	5,200
Northern districts	4,270
Other parts of England	1,800
Scotland	1,690

The imports of foreign stock into London have been as follows:—

	Head.
Beasts	1,643
Sheep	5,770
Calves	501
Pigs	25
Total	7,919

Same time in 1853	12,847
— 1852	10,567
— 1851	9,018
— 1850	3,220
— 1849	4,495
— 1848	5,485

Newgate and Leadenhall have ruled dull, at drooping prices, owing to the large arrivals. Beef has sold at from 3s. to 4s. 4d.; mutton, 3s. 4d. to 4s. 8d.; veal, 3s. 4d. to 5s.; pork, 3s. 4d. to 5s. per slbs. by the carcase.

PLATE I.

A HEREFORD IN-CALF HEIFER.

THE PROPERTY OF LORD BERWICK, OF CRONKHILL, NEAR SHREWSBURY.

ENGRAVED BY BACKSHELL, FROM A PAINTING BY H. B. DAVIES.

The subject of our first plate obtained the first prize, in class 4, at the Lewes Meeting of the Royal Agricultural Society of England in 1852; and at the Gloucester Meeting, last year, as a cow in milk, she was highly commended.

This animal was got by Wonder (420), dam Blanche by Ashley Moor (791), g. dam Blowdy by Cholstrey (865), g. g. dam was bred by the late Thomas Andrew Knight, Esq., of Downton Castle, near Ludlow, Salop.

PLATE II.

JOE MILLER.

THE PROPERTY OF F. J. PARKER, ESQ.

ENGRAVED BY E. HACKER, FROM A PAINTING BY HARRY HALL.

Joe Miller is a dark bay colt, standing scarcely fifteen hands an inch and a half high. He has a true Venison head, wide between the eyes, but tapering towards the nose, with a full ear and expressive eye. His neck is set very clean into his head, and his shoulder, a beautiful one, well thrown into his back. This itself is good, though he is light in his ribs, with quarters drooping towards the tail. His thighs and gaskins, again, are light, as he is also in bone, but only proportionately, being altogether a light horse. He has rather long, springy pasterns, and very clean joints. When mounted, full of play, arching his neck, and carrying his tail well away from him, Joe Miller presents a really "pretty" specimen of the active corky English horse, although he hardly gives you that promise for going through dirt he has more than once realized.

He was bred by Mr. Sadler in 1849, was got by Venison out of Witticism, by Sultan Junior, her dam Victoria, by Tramp—Bella, by Beninborough.

CALENDAR OF AGRICULTURE.

The ploughing of leys and stubbles will go on during the whole of this month, and often very busily, from being impeded by frosts and snows the previous months. Continue the carting of dung to the fields, earths for composts, and stones for drains. Thresh regularly for fresh straw for the cattle, and push forward such operations that they may not impede the sowing season now approaching.

Begin feeding animals with oilcake, broken or bruised in troughs for cattle in the yards, and in the fields for sheep. It much hastens fattening, and greatly improves the quality of the dung. Oats are very well used with it, and a portion of salt. Ewes will now drop lamb very fast; attend to shelter, and the supply of food. In good weather, pull and dress, and lay in pits, and remove from all lands turnips of all kinds for the live stock, that the land may be ready for sowing. Continue the feeding of stock as directed last month.

Plant during fresh open weather, on suitable grounds, all kinds of forest trees, especially oak, ash, elm, and birch; the second year, cut over all sprouting trees close by the ground, to secure a more vigorous growth; and when two or three years grown, cut away all other shoots, leaving the best and most vigorous for a tree. Plant osiers in beds or rows made on low damp grounds that cannot be advantageously made arable from inundations or similar causes. Lay the beds as dry as

possible, and done a year before planting. Cut underwood and fell timber during the whole of this month; and plant new hedges, plash and repair old ones.

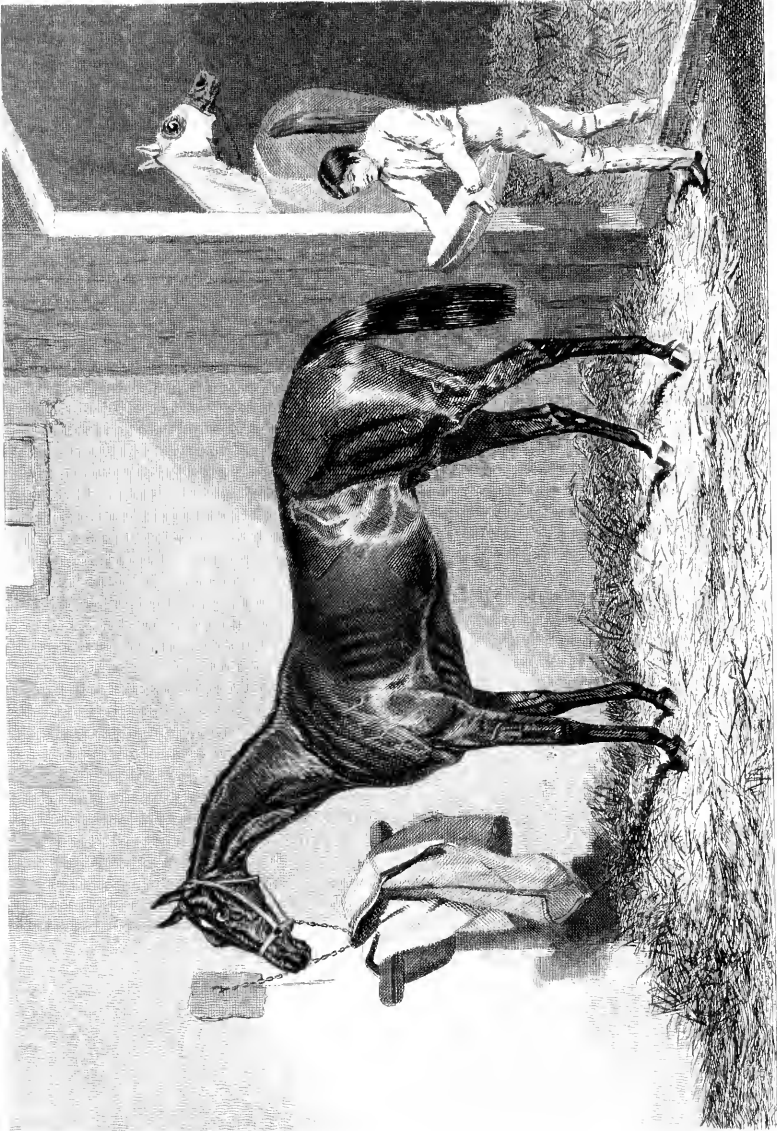
Prepare artificial manures of all kinds possible; flood meadows; and if the weather be fine, begin to lay dung on grass lands, rough or strawy, and then bush-harrow and roll, and pick off stones and rubbish. Begin also to repair gates and fences; to put grass lands into order, by spreading tufts of dung and by removing any obstructions.

Dig hop grounds, open the hills, and apply strong manures—rotten farmyard dung, composts of lime and salt, rags, and briny oleaginous substances do well. Dress the roots, and cut off the shoots for sets.

Continue underdraining and subsoil ploughing, and the thrashing of grain: sell and deliver it.

In early localities and on dry warm lands, the sowing of crops will begin during this month. Sow early peas on newly stirred soils, broadcast or in drills. Sow beans by dibbling or on ridges, or by drilling on the flat surface. Sow spring wheat and barley on the last year's turnip lands, with one furrow; and spring vetches mixed with barley, oats, or beans, for horses and sheep food. Sow cabbage seeds on warm well-prepared grounds for plants to be planted in the field in May and June.

Collect manures, and prepare peats and similar substances for burning into ashes.





REVIEW OF THE CORN TRADE DURING THE MONTH OF JANUARY.

The new year has commenced under a threatening aspect. After thirty-seven years' peace, war has become imminent. The mere probability of such an event would at any time have had considerable influence on prices of provisions; but coming, as it does at present, after one of the shortest harvests gathered for years, its effects are likely to be greatly increased. That the future course of the grain trade will be dependent in a great measure on the development of political events, is certain; and as it is impossible to foresee what may take place—with hostilities between the Russians and Turks in full progress, and the allied fleets in the Black Sea—we can only speak of the future conditionally. Should the Emperor of Russia be brought to a proper sense of his own position, and yield to the representations of England and France—backed as these will now be by force—the upward movement in prices of grain might perhaps be arrested; but actual war would interfere so greatly with the facilities of obtaining supplies, that in such a case we might see quotations higher than the most sanguine at present anticipate. The first step on the part of the Czar would no doubt be to stop the export of corn, as well from the Black Sea as from the Russian Baltic ports. This would completely upset all previously arranged calculations, would prevent the purchases made on British account during the winter months being made available; and France, being debarred from obtaining aid from Odessa, &c., would have to compete with us in the American markets and at the Lower Baltic ports, for a supply of food. In such a position of affairs it would no longer be a question of price, so long as a sufficient supply could be secured. It is scarcely necessary to point out to our readers how large a proportion of the total importation of grain has of late years been from Southern Russia. Odessa and Galatz have furnished immense quantities of wheat and Indian corn, not only to us, but to those ports in the Mediterranean which have needed supplies. Owing to the failure of the crops in 1853, in many of the Italian states, and the serious deficiency in France, assistance from the Black Sea has become more urgently necessary than in ordinary years; and a prohibition of exports from Russia would make itself felt immediately all over Southern as well as Western Europe. The shipments from St. Petersburg, Riga, Archangel, &c., usually fall to the share of Great Bri-

tain, and the detention of the spring supplies of wheat and oats from those places would tell very forcibly on the English and Scotch markets. It will be seen at once, then, how materially the issue of the Eastern quarrel is mixed up with the future range of prices of food, not only in this country, but all over the world; and when it is borne in mind that peace or war depends on the will of a single individual, anything like a positive opinion would be worse than useless.

The trade has, as might naturally have been expected under the circumstances, been feverish and excited; but the tendency of prices has on the whole continued upwards. We shall now dismiss political considerations, and take into account the state of affairs independent of war or peace. Considerable difference of opinion exists as to the extent of the stocks of wheat in farmers' hands. Certainty on this point, or anything like certainty, is unfortunately unattainable, and we can therefore only argue from inference. There is reason to believe that the growers were large holders of old wheat at harvest time; but it being admitted on all hands that the produce of the last crop was miserably deficient and of wretchedly bad quality, the deliveries of old wheat some months after harvest were unusually liberal. In consequence of this, it had before November become a rarity to meet with a sample of old wheat of home growth. The deficiency of the yield of the harvest of 1853 was not fully understood until thrashing had made considerable progress. We know many cases where the produce of a given number of acres has turned out only one-half of what was obtained from the same land in former years; and even in the most favourable districts we have heard of no cases of a yield approaching an average. When, therefore, old stocks had become nearly exhausted, and consumption was fairly thrown on the new crop, the stacks were found to give very little wheat in comparison to straw, and diminished very rapidly. Though farmers have thrashed freely during the dry frosty weather, the supplies from the growers have not at any time been large; which, when we take into account the strong inducement that the prices current for some time past must have held out to realize, may be regarded as tolerably conclusive evidence that stocks in farmers' hands are much lighter than usual at the same period of the year. This belief is further strengthened when we

consult the meagre statistics at our command, the best of which we consider to be the return made for taking the average price of the kingdom.

The following table of the quantities sold at the towns furnishing the return for compiling the averages will be found interesting, and affords corroborative evidence of the extreme deficiency of the last crop. The sales from the beginning of September have been as follows:—

1853.				1852.			
Week ending	qrs.	s.	d.	Week ending	qrs.	s.	d.
Sept. 3.	89,619	50	4	Sept. 4.	74,139	44	9
„ 10.	104,937	54	9	„ 11.	76,494	42	5
„ 17.	93,539	56	7	„ 18.	93,857	40	5
„ 24.	96,461	56	7	„ 25.	106,800	39	6
Oct. 1.	101,508	59	5	Oct. 2.	114,961	38	9
„ 8.	103,932	64	0	„ 9.	115,663	33	5
„ 15.	95,494	68	4	„ 16.	114,838	37	10
„ 22.	85,066	68	11	„ 23.	117,026	33	8
„ 29.	84,623	69	1	„ 30.	104,437	39	2
Nov. 5.	79,011	71	9	Nov. 6.	104,810	39	5
„ 12.	72,622	73	7	„ 13.	109,376	39	11
„ 19.	65,173	72	7	„ 20.	96,792	40	0
„ 26.	70,629	72	0	„ 27.	94,301	40	5
Dec. 3.	73,714	72	7	Dec. 4.	116,791	41	2
„ 10.	70,353	71	11	„ 11.	121,024	42	1
„ 17.	55,349	70	9	„ 18.	121,850	43	10
„ 21.	71,764	70	0	„ 25.	114,032	45	11
„ 31.	76,785	73	0	1853.			
	1854.			Jan. 1.	102,845	46	7
Jan. 7.	64,329	76	2	„ 8.	90,701	46	0
„ 14.	60,500	78	10	„ 15.	111,555	45	10
„ 21.	64,581	82	4	„ 22.	114,972	45	8

The smallness of the home supplies have not, thus far, been felt in full force, owing to the liberal character of the arrivals from abroad; but imports to the extent of 500,000 to 600,000 qrs. of wheat and flour per month have caused little or no pressure. All that has reached us has been needed; and, with the exception of London, Liverpool, and Bristol, no stocks of moment of foreign breadstuffs are held in any part of the kingdom.

We have still at least seven months' consumption to provide for, before the harvest of 1854 can be hoped to be made available. Shall we be enabled to obtain foreign supplies during that period on the same scale as heretofore?—that is the question. Should the Black Sea and the Baltic Russian ports be closed against us, the answer would be decidedly—*No!* And even with all the aid Russia might be enabled to give, there would, we think, be little prospect of supply exceeding demand. We do not, therefore, look for a permanently lower range of quotations, and should not be surprised to see prices considerably higher.

In the early part of the month there was a lively consumptive and a fair export demand for wheat and flour, and prices advanced 5s. to 6s. per qr. When the millers had secured what they deemed sufficient to satisfy their immediate wants, they ceased to operate. At the same time, the French and Belgian inquiry slackened; subsequently it

ceased altogether, and afterwards we had offers from both these countries of some of the wheat we had previously shipped. This, and large arrivals of wheat and flour from America at Liverpool, into London, Glasgow, &c., caused a sharp reaction, and at many of the leading provincial markets prices receded from 3s. to 5s. per qr. about the middle of the month.

Farmers appeared to take alarm at this decline, and hurried wheat to market faster than at any previous time since harvest, of which the millers took advantage. The American supplies, with the increased deliveries from our growers, have, however, produced no permanent impression, the reduction having already been recovered.

The weather was very severe the latter part of December and in the beginning of January; and at one period there was danger of the navigation of the river Thames becoming wholly stopped. The canals in all parts of the country were completely frozen up; and, though the last fortnight has been mild, some of the inland water-courses are not yet free from ice.

The frost has probably done much good, inasmuch as it is likely to have destroyed slugs and other insects, which were previously much complained of.

The young wheat blade, since it has emerged from its covering of snow, is reported to look healthy; and thus far we regard the prospects for 1854 crop as promising. The breadth of land under wheat is large here as well as on the continent of Europe; and it is not improbable that the present scarcity may be followed by abundance.

Business at Mark-lane has maintained a firm tone throughout the month; and during the time of the greatest depression—when prices receded, as already intimated, at all the leading country markets—the decline in London was scarcely quotable. This has, no doubt, been owing to the insignificance of the home supply, and to the fact that the arrivals of breadstuffs from the other side of the Atlantic have not been nearly so heavy here as at Liverpool.

The receipts of wheat coastwise and by railway have been very small; and the quantity brought forward by land-carriage from Essex, Kent, and Suffolk, quite trifling.

On the first Monday in the month, the 2nd inst., the English wheat was taken off readily by the town millers, at prices about 4s. per qr. above those current previous to the Christmas holidays. During the succeeding week the weather began to give, which affected the condition of the new wheat, and purchasers consequently acted with rather more caution; the sales made on the 9th were, nevertheless, at a further rise of 4s. to 5s. per qr. on

previous rates; but on the 16th the turn was in favour of the buyers—not, however, to an extent rendering alteration in quotations necessary.

Since then no improvement has taken place in condition; indeed, most of the samples exhibited on Monday last (23rd inst.), were in very indifferent order; and, though the tone of the trade was firmer than in the middle of the month, no advance could be established.

The arrivals of wheat from abroad have been tolerably good, having amounted in round numbers to 80,000 qrs. Of this supply quite one-half has been from America. During the first fortnight in January there was a lively country demand, and the local millers were likewise free buyers; importers were, consequently, enabled to obtain higher prices by 8s. to 10s. per qr. than those current towards the end of December. For good white American wheat 90s. to 91s., and for fine ditto 92s. to 93s. per qr. was paid on the 9th inst.; whilst a parcel of superior Rostock realized 92s. per qr. To this a period of quiet succeeded, during which time a few anxious sellers lowered their pretensions to the extent of 1s. to 2s. per qr. In all such cases buyers were easily found, and on the 23rd the decline had been completely recovered; indeed, for choice qualities, the very highest point was exceeded by 1s. per qr.—as much as 94s. per qr. having on that occasion been paid for American white wheat, and corresponding rates for the best Lower Baltic red.

St. Petersburg, Polish Odessa, and similar qualities of wheat are at present 5s. to 6s. per qr. dearer than they were at the close of December; and there is scarcely anything *sweet* to be had at Mark-lane below 70s. to 75s., whilst very moderate qualities bring 80s. per qr.

Stocks in granary have certainly diminished, notwithstanding the extent of the importation. Our quotations having at length advanced above the level of the continental markets, we have within the last week or two had offers from some of the near ports, principally from Antwerp.

Prussian red wheat, of fair quality, has been offered at 82s. per qr., including freight to London. This wheat would have to be conveyed by railroad from the interior of Prussia to the Belgian shipping port, so that the price which the grower would net would not be very high. It shows, however, that our continental neighbours will not be slow to supply all they can spare, so long as there is a chance of profit. From the Lower Baltic ports good red wheat, to be shipped at first open water, had been offered at 72s. per qr. free on board, a price which would allow of the addition of freight, insurance, and sound dues, and still leave a fair margin for profit on present prices. These facts are worthy the consideration of our farmers; they appear to

indicate that they are not so bare of stocks abroad as has been represented. And in case a peaceful arrangement of the Russian and Turkish quarrel could yet be concluded, it might perhaps be dangerous to hold at present rates.

From the Black Sea we have had very few offers, but we know that several vessels have been engaged at Marseilles to load wheat for the United Kingdom; hence we may expect to receive some aid from ports east of Gibraltar.

The town millers have been at variance throughout the month in regard to the nominal top price for town-made flour. When we last addressed our readers it was 70s. per sack: at this it stood until the 9th instant, when some of the principal millers considered that the advance in wheat warranted a rise of 5s. per sack, but others deemed 2s. per sack sufficient, and we believe that the latter has become the more general quotation. Meanwhile, town-manufactured household flour has risen to 70s. and Norfolk to 63s. per sack; the difference between the nominal top price and quotations of other sorts is therefore not so great as usual. The demand for American flour has throughout the month been active, and very large parcels have been taken off the market for consumption: the rise in the face of good supplies has been at least 3s. to 4s. per brl., with an appearance of a further advance in consequence of decreased arrivals. Good brands of Western Canal, Ohio, &c., are now worth 44s. to 45s., and fine Baltimore and Philadelphia 46s. up to 48s. per brl.

The arrivals of barley of home-growth have not been by any means heavy, and when wheat sprung up, as it did in the early part of the month, barley participated in the upward movement; since then, however, the inquiry has again slackened, and quotations for malting and distilling qualities are very nearly the same at present as they were at the end of December. The supply of barley from abroad has scarcely sufficed to satisfy the demand, and the late reaction in the value of English has not had any effect on prices of foreign. So soon as it shall have become practicable to commence shipments from Denmark, we shall no doubt receive a fair quantity from thence, as our present prices are very tempting, and contracts to some extent have been made during the winter at Hamburg, &c., to ship from the Danish islands at first open water. Egyptian barley has become scarce—the arrivals from Alexandria having for some time past been comparatively small; holders have consequently been exceedingly firm, and very full terms have been realized for this description—quality taken into consideration.

The quantity of malt brought forward has not been in excess of the demand; and though the

latter has not been particularly active, needy buyers have had to pay somewhat enhanced rates.

The arrivals of oats into the port of London have been considerably below the quantity needed for the consumption of the metropolis and its environs. The want of adequate supplies caused a rise of 1s. to 2s. per qr. on the 2nd inst. This advance has since been well maintained; but the dealers have in general confined their operations to as narrow limits as their immediate wants have admitted. Good foreign feed may be quoted 30s. to 32s., Irish from 28s. to 30s. black, and 30s. to 33s. white. Scotch, which have all through been relatively cheap, have this month brought somewhat better prices, but it has nevertheless been difficult to exceed 35s. for old, or 33s. for new feed. Of English oats very few have appeared, and the greater part of what has come to hand has consisted of light inferior qualities, ranging in weight from 33 lbs. to 39 lbs., and in price from 25s. to 31s. per qr. With regard to the probable future range of prices of this grain, we are inclined to think that present rates are safe until such time as the early spring shipments from Holland, Holstein, and Denmark begin to come forward. Some decline may perhaps then take place; but later on we shall certainly miss the Russian supplies, and we should not be surprised to see oats very dear towards the latter part of the summer.

There has been less doing in beans than might have been expected—the consumption of that article being invariably more extensive in the winter months than at any other time. The supplies have not been large, and there having been no pressing sellers, prices of English as well as of foreign have been steadily supported.

During the time that the frost was most intense there was a temporary spurt in the inquiry for peas; but the highest price paid for white boilers did not exceed 64s. per qr., and it would now be difficult to make three guineas for the very best. Grey and maple peas have moved off in retail quantities on much the same terms as those previously current.

There has been less doing in Indian corn than has usually been the case in former times when there has been excitement in the wheat trade, and thus far the article bears a relatively lower value as compared with that of wheat than it did in 1847. This has no doubt been caused by the superior produce of potatoes in Ireland—that crop having turned out much better in the sister isle than on this side of the channel. Meanwhile, the offers from the Black Sea ports, and the arrivals from thence off the coast, have been very small; notwithstanding, therefore, the want of activity in the demand, prices have crept up, and Galatz maize could not be bought below 54s. to 55s. per qr., cost and freight, at present. At some of the Mediterranean

ports the article is worth considerably more than it is here, which accounts for the insignificance of the supplies from the East; but we are rather surprised that America has not furnished a larger quantity than she has.

The remainder of our space we must devote to a short notice of the substance of the latest foreign advices. The early part of the winter was very severe all over the Baltic, and the navigation was closed early; since the beginning of the present month the frost has been much less intense, and the ice was, according to the latest accounts, still firm; it was therefore not expected that the navigation would open much before the usual time. Stocks of old corn of all kinds appear to have been reduced into a very narrow compass by the large shipments during the summer and autumn, and as there is reason to believe that the last harvest was short over nearly the whole of continental Europe, it will need high prices to draw large supplies.

At Danzig, the entire quantity of wheat in store at the commencement of the new year was very little over 4,400 lasts, and of rye only 495 lasts were held. The exports from thence, in 1853, had amounted to 48,520 lasts wheat, and 1,702 lasts rye. The quality of the new wheat of the surrounding neighbourhood is described as very inferior; but in Upper Poland the produce was better spoken of. Notwithstanding the inferiority of the quality of the new wheat, all that had come forward had met takers at enhanced terms. The weight of some of the ordinary samples is stated to be only 54 to 56 lbs. per bushel; and we are informed that it will need great care in selection to obtain 59 to 60 lbs. qualities. Very few bargains for spring shipment had been closed, as sellers had not felt disposed to enter into forward contracts except at very high prices.

Advices from Königsberg confirm what has previously been said respecting the unfavourable result of the last harvest in that neighbourhood, and our correspondent states that more than ordinary care will be required to secure qualities suitable for the British market. Hardly any spring corn was held at that port, the deliveries from the growers having hardly sufficed to provide for the local wants. Of wheat, the stock in granary consisted, on the 1st of January, of only 28,350 qrs. Rye had been much sought after, for Stettin and Berlin account, and the article was then worth equal to 46s. per qr., free on board. Wheat, of 60 lbs. weight, might have been bought there at 66s., and samples half a pound per bushel heavier not below 67s. 6d. per qr. free on board in spring.

At the Lower Baltic ports the quantity of wheat in store is described as very small indeed; nowhere

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's Gazette.			Averages from the corresponding Gazette in 1853.			
	s.	d.		s.	d.	
Wheat...	60,500	78	10	111,555	45	10
Barley...	87,532	42	0	92,318	29	10
Oats...	17,952	26	4	21,975	18	7
Rye.....	141	47	7	180	30	8
Beans...	4,310	48	9	5,984	34	8
Peas...	1,784	51	7	2,476	30	7

PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.).. sowing 62s. to 66s.; crushing 50s. to 56s.
 Linseed Cakes (per ton)..... £10 0s. to £10 10s.
 Rapeseed (per last)..... £30 to £35
 Ditto Cake (per ton)..... £6 15s. to £7 5s.
 Cloverseed (per cwt.)..... (nominal) .. 00s. to 00s.
 Mustard (per bush.) white new 10s. to 14s., brown old 10s. to 13s.
 Coriander (per cwt.)..... new 10s. to 15s., old 10s. to 15s.
 Canary (per qr.) 55s. to 58s.
 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.) 27s. to 34s.
 Cow Grass (per cwt.)..... (nominal) .. 00s. to 00s.

FOREIGN SEEDS, &c.

Linseed (per qr.)... Baltic, 50s. to 55s.; Odessa, 55s. to 58s.
 Linseed Cake (per ton)..... £9 10s. to £10 10s.
 Rape Cake (per ton)..... £6 15s. to £7 5s.
 Hempseed, small, (per qr.).. 37s.,..... Ditto Dutch, 40s.
 Tares (per qr.) new, small 60s., large 62s.
 Rye Grass (per qr.) 28s. to 35s.
 Coriander (per cwt.)..... 10s. to 13s.
 Clover, red..... 56s. to 66s.
 Ditto, white 72s. to 92s.

HOP MARKET.

BOROUGH, MONDAY, JAN. 23.

A considerable amount of business has been done during the past week, particularly in the better qualities of Hops; and although importations of foreign Hops still continue to a considerable extent, prices have been tolerably supported, at about the annexed rates.

	£	s.	£	s.
Mid and East Kents.....	11	0	15	0
Weald of Kent.....	9	0	10	10
Sussex pockets.....	8	0	9	0

POTATO MARKETS.

MONDAY, JANUARY 23.

SOUTHWARK WATERSIDE.

During the past week there have been no arrivals either coastwise or foreign; and the market being now quite cleared out, no quotations can be made.

BOROUGH AND SPITALFIELDS.

A fair average supply of Potatoes has come to hand since Monday last, chiefly per railway. The imports have been small, viz., 50 tons from Belfast, 2 from Limerick, and 6 baskets from Harlingen. A good business is doing, as follows:—Kent and Essex Regents, 160s. to 180s.; Scotch ditto, 140s. to 160s.; ditto Cups, 120s. to 140s., per ton.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	s.	s.	Cheese, per cwt.	s.	s.
Friesland.....	104	10	Cheshire, new.....	64	80
Kiel.....	104	110	Cheddar.....	66	80
Dorset.....new	106	114	Double Gloucester	64	72
Carlton.....	102	108	Single do.....	64	70
Waterford.....	98	102	Hams, York, new.....	74	84
Cork.....	100	108	Westmoreland.....	70	80
Limerick.....	92	102	Irish.....	66	74
Sligo.....	100	106	Bacon, Wiltshire, green	66	68
Fresh, per doz. 15s.0d. 18s.0d.			Waterford.....	64	66

HIDE AND SKIN MARKETS.

Market	Hides, 56 to 64 lbs.	£	s.	d.	per lb.
Do.	64 72 lbs.	0	23	0	3
Do.	72 80 lbs.	0	3	0	3 1/2
Do.	80 88 lbs.	0	3	0	3 1/2
Do.	88 96 lbs.	0	3	0	3 1/2
Do.	96 104 lbs.	0	4	0	4 1/2
Horse Hides.....		6	6	0	each.
Calf Skins, light		2	0	3	6
Do. full		6	6	0	0
Polled Sheep		8	0	10	0
Kents		7	0	8	6
Half-breeds		7	0	8	0
Downs		5	3	6	3

WOOL MARKET.

BRITISH WOOL TRADE.

MONDAY, JAN. 23.

Notwithstanding that the colonial wool sales are appointed to commence on the 9th proximo, our market continues steady, and prices are well supported. The demand is chiefly confined to home use, and the supplies offering are very moderate.

	£	s.	d.	to	£	s.	d.
South Down Hoggets	1	4			1	6	1/2
Half-bred ditto	1	4			1	5	
Ewes, clothing	1	1			1	3	
Kent fleeces	1	2			1	4	
Combing skins	1	0 1/2			1	4	
Flannel wool	1	0			1	5	
Blanket wool	0	8			1	0	
Leicester fleeces	1	2			1	4	

LEEDS ENGLISH WOOL MARKET, JAN. 20.—Sales this week have been to a moderate extent, and prices without any change.

LIVERPOOL WOOL MARKET, JAN. 21.

SCOTCH WOOL.—There has been a great many people in town at the public sales of foreign, and the business done in all kinds of Scotch has been fair at late rates.

	£	s.	£	s.
Laid Highland Wool, per 24lbs.	13	0	14	0
White Highland do.	16	6	18	0
Laid Crossed do, unwashed	16	0	18	0
Do. do, washed	18	0	20	0
Laid Cheviot do, unwashed	19	6	21	0
Do. do, washed	22	0	24	0
White Cheviot do do	26	0	32	0

LEEDS FOREIGN WOOL TRADE, JAN. 20.—This branch of trade has partially recovered from the state of inactivity which has prevailed during the last month. Prices are firm, and have been singularly well supported on the basis of the closing rates of last sales.

MANURES.

PRICES CURRENT OF GUANO.

Peruvian Guano..... per ton	£10	0	0	to £10	10	0
Do. first class (damaged) ..	9	5	0	0	0	0
Bolivian Guano.....	8	10	0	0	0	0

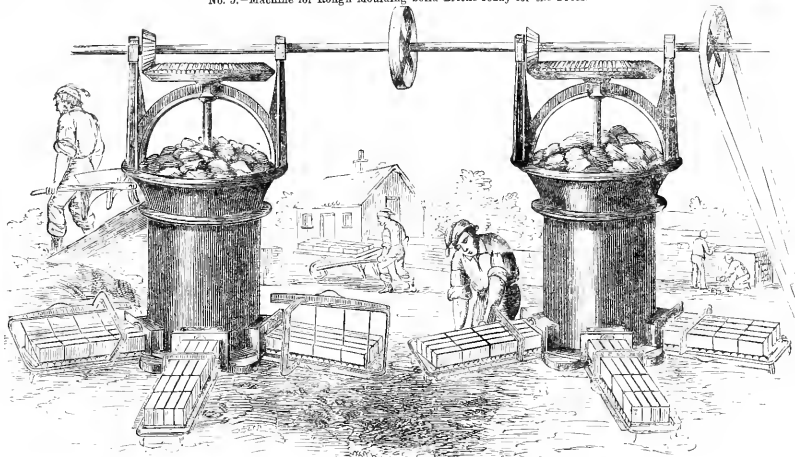
ARTIFICIAL MANURES, OIL CAKES, &c.

Peat Charcoal.....	3	0	0	0	0	0
Nitrate Soda.....	18	0	0	15	10	0
Nitrate Potash or Saltpetre.....	20	0	0	31	0	0
Sulphate Ammonia.....	17	0	0	18	0	0
Muriate ditto.....	22	0	0	23	0	0
Superphosphate of Lime.....	6	0	0	8	0	0
Soda Ash or Athali.....	0	0	0	8	0	0
Gypsum.....	1	15	0	3	0	0
Coprolite.....	4	0	0	4	10	0
Sulphate of Copper, or Roman Vitriol for Wheat steeping.....	44	0	0	0	0	0
Salt.....	1	1	0	1	5	0
Bones & dust..... per qr.	0	16	0	0	17	0
Do. do.....	0	17	0	0	18	0
Oil Vitriol, concentrated..... per lb.	0	0	1	0	0	0
Do. Brown.....	0	0	0	1	0	0
Rape Cakes..... per ton	6	5	0	6	7	6
Linseed Cakes.....	10	17	6	11	10	0
Thin American in brls. or bags	9	12	6	9	15	0
Thick ditto round.....	10	0	0	10	5	0
Marselles.....	10	0	0	10	5	0
English.....	10	15	0	11	0	0

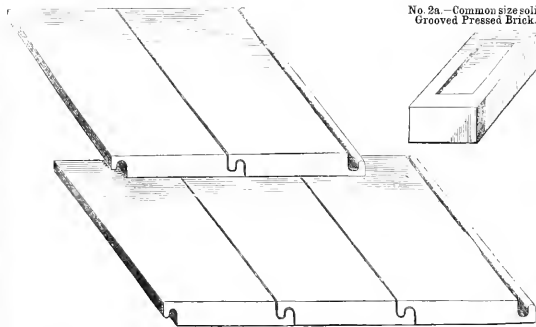




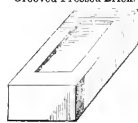
No. 5.—Machine for Rough Moulding Solid Bricks ready for the Press.



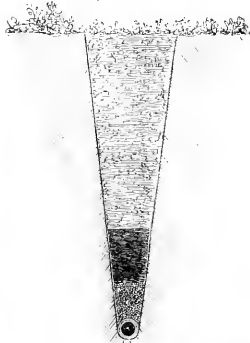
No. 82.—Patent Tubular Tiles, with the ends closed.



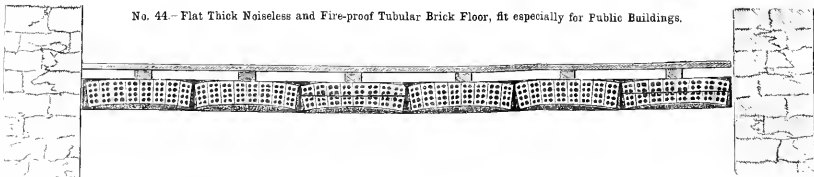
No. 2a.—Common size solid Grooved Pressed Brick.



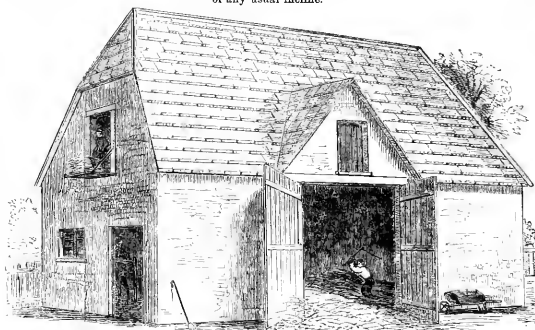
No. 110.—Representation of a Drain.



No. 44.—Flat Thick Noiseless and Fire-proof Tubular Brick Floor, fit especially for Public Buildings.



No. 84.—Barn roofed with the Patent Tubular Tiles, showing the Ventilation—applicable to Roofs of any usual incline.



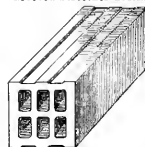
No. 13a.—Semi-tabular or Metropolitan common size Grooved Stretcher Brick.



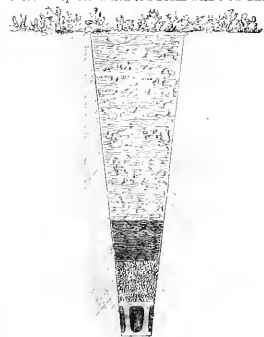
No. 13b.—Semi-tabular or Metropolitan common size Grooved Header Brick.



No. 13c.—Semi-tabular or Metropolitan double size Grooved Stretcher Brick.



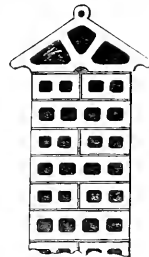
No. 137.—Representation of a Drain with New Tile.



No. 13d.—Semi-tabular or Metropolitan double size Grooved Header Brick.



D.—Section of a Ten-inch Hollow or Tubular Brick Wall, with a new Copping Tile.



No. 70.—Flat Roofing Tile.



THE FARMER'S MAGAZINE.

MARCH, 1854.

PLATE I.

SHROPSHIRE DOWN SHEARLING EWES.

THE PROPERTY OF W. FOSTER, ESQ., OF KNIVER HILL FARM, NEAR STOURBRIDGE.

The Special Prize of £10 for the best Pen of Five Shropshire Down Shearling Ewes was awarded to the sheep represented in our plate, the property of W. Foster, Esq., of Kniver Hill Farm, near Stourbridge, at the meeting of the Royal Agricultural Society of England, held at Gloucester, in July, 1853. Five ewes with their lambs (from this flock) obtained the Special Prize of £10 at the above meeting, and a second pen of Shearling Ewes were highly commended. Three Wethers from this flock obtained the First Prize of £8 and the Silver Medal for the best Shropshire Down Fat Wethers, at the Midland Counties Show of Fat Stock, held at Birmingham, in December, 1852.

These ewes also won the first prize for Shropshire Down Shearling Ewes at the Show of the Ludlow Agricultural Society in September last.

PLATE II.

PATENT MACHINERY AND BUILDING MATERIALS FOR AGRICULTURAL PURPOSES.

(For description see page 184.)

ON SOME LATE RESEARCHES UPON NITROGENOUS MANURES.

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

The advocates of agricultural improvements can hardly desire a better return for their exertions than those which have attended the continued examination of the theory and practice of manuring. We are most of us old enough to remember the first attempts to use more than one of the now extensively employed artificial manures, and the steady opposition with which their introduction was received, their gradual progress, their eventual success. It is in this good cause that an able Scotch farmer, Mr. George Hope, of Fenton Barns, has been labouring, endeavouring to decide doubts and remove apparent obstacles to the use of guano in turnip cultivation. He thus concludes his prize
OLD SERIES.]

essay "On the feeding properties of turnips raised with farmyard manure and with guano." (*Trans. High. Soc.*, 1854, p. 179): "If it may be presumed that five or six animals, as in the present case, are a sufficient number to prevent any serious mistake, and from which to draw a fair conclusion, it may be readily inferred that there is very little difference, if any, in the feeding qualities of turnips raised with guano alone, from those grown with farmyard manure. In this case, also, as in all other experiments made by the writer, the heaviest crop was produced by the mixture of these manures; while the advantage on the score of cheapness—and it a most important one—was decidedly

in favour of guano. Indeed, it is to the invaluable aid of the latter that the farmers of the United Kingdom are mainly indebted for having been successfully carried through a transition state of doubt and difficulty, the approach of which few regarded without alarm, as it was not unfelt even by those who had strongly advocated the propriety of the change."

In the same volume, p. 171, is another valuable prize essay on the same subject, by Mr. James Porter, of Monymusk, in which he alludes to the common opinion of the farmer, that guano-grown turnips do not keep quite so well as those produced by farmyard dung. He observes—"The turnips grown with guano, in my experiments, were considerably larger than those grown with farmyard manure; but they appeared softer in quality, and did not weigh so well to the bulk, showing more of that spongy or woody fibre, incompatible with the nature of a good turnip. In making occasional trials for the last ten years, the soft nature of guanoed turnips has always attracted my notice, and particularly their tendency to decay during the winter months. I generally use but a small quantity of guano for bringing forward a close early braid of the turnip plant; and where a fair quantity of good dung can be got, I have seldom seen it fail to carry on the crop to maturity, and produce roots of a superior quality. As a substitute for dung, I have found bones fermented or dissolved to produce turnips of better quality than guano; and on light soils I always use them in conjunction with dung and a little guano, and find that to answer well.

"From my experiments, I am led to infer that dung produces the most nutritious turnips for feeding purposes, and that dung and guano give the next best in point of quality, and that guano is inferior to either, even where the turnips are consumed early; if they had stood till spring, I am convinced the difference against the guano would have been much greater. When raised with guano, they should be always eaten in autumn, or as soon thereafter as possible."

The effect produced upon the growth of the turnip crop by the use of guano, in the trials of Mr. Porter, was as follows:—Half an imperial acre of good light loam produced of bulbs of Laing's Swedish turnips,

	Tons. Cwts.
With 2½ cwt. of guano	10 0
With 12 cubic yards of farmyard manure	10 0
With 6 yards of ditto and 1 cwt. 14 lbs. of guano	11 3

One acre of light outfield, on a subsoil of poor gravelly clay, produced of bulbs of the golden-yellow turnip,

	Tons. Cwts.
Manured with 4½ cwt. of guano ...	17 3
Manured with 20 yards of farmyard manure	17 2
Manured with 10 yards of manure and 2½ cwt. of guano	18 7

Mr. Hope's trials were made on a field of 41 acres, composed of soils of three or four varieties. The produce of bulbs, per imperial acre, of the Fosterton hybrid, or green-topped yellow turnip, was as follows:—

	Tons. Cwts.
From 3½ cwt. of Peruvian guano and 10 cart-loads of farmyard manure	20 16
From 6½ cwt. of guano	19 5
From 20 cart loads of farmyard manure	17 14

In connection with the valuable results obtained by these industrious Scotch farmers, the report of the Leckerbie Farmers' Club upon the turnip crops grown in the middle and upper districts of Annandale, in the season of 1853-54, is full of instruction to the young farmer, especially at the season of the year now closely approaching. When alluding to the various manures applied to these crops, the members of that valuable Club remark—"The tables show that yearly the quantity of extra manure is on the increase, and confirm the practice, which is becoming every year more general, of giving bones, either raw or dissolved, along with guano and dung. The great crops at Hardgrave, for several years, brought this under notice, and the large weights of all sorts at Dalhible, Shaw, and Barnsdale, (the two latter at an elevation of 500 feet and second rate quality of soil) which appear in the tables of this year, may extend still more the practice of applying bones in both forms. One member showed from a distinct set of experiments, in each of the last seven years, and on different varieties of soil, that dissolved bones, at the same expense, produced equal results in the turnip crop with guano, while the greater permanency of its effects, on the succeeding crop is acknowledged. For economy, and securing a genuine article, home dissolving was recommended; and this led to the members of the Club expressing strongly their desire that a bone-grinding mill should be erected in the middle district of Annandale, which from its convenience would increase the use of bones in every shape."

Let the young farmer compare the valuable practical remarks of these careful agriculturists with those of the able and more scientific notices of the President of the Royal English Agricultural Society, which he will find in the last number of the Society's Journal, p. 374—"On the natural law which nitrate of soda acts as a manure, and on its substitution for guano." He will find here a mass of the most interesting and instructive

matter, closely bearing on the subject of this paper. Mr. Pusey's concluding remarks are as follow :—

“There remains only to be considered the application of guano to turnips; but here the comparison of the two manures is less easy, because a previous question arises—whether either one or the other should be applied to turnips at all, or whether in the culture of those roots we should not rather rely upon bone-earth. From experience I have long done so on my own farm. There are on record experiments clearly showing that on some land superphosphate is not only cheaper than guano, but more effectual; and as the consumption of guano for this purpose is very great, especially among the spirited farmers of East Lothian, it will be worth while to recall one or two of those experiments, and first a very striking one made by Mr. Drewett, near Arundel :—

Purchased Manure.	Weight of Turnips, per acre.	
	Tons.	Cwts.
None	5	18
3½ cwt. Peruvian guano.....	9	2
3½ cwt. African guano	13	1
Superphosphate from 6 bush. <i>calcined</i> bones	17	10

“It is observable here that not only has the superphosphate excelled the guano, but the cheap African has surpassed the dear Peruvian guano, because it contains less nitrogen indeed, but more of the phosphates. Mr. Caird also states that the inferior and cheaper Bolivian guano is better for turnips than the Peruvian, the ground of that superiority of course being the same—the excess of phosphates in a given weight of Bolivian guano.

“Mr. Lawes even found that where he had supplied his turnips with superphosphate, all the nitrogenous manures he could add to that manure produced no increase in his crop.

Nitrogenous Manures added.	Mean produce of turnips per acre.	
	Tons.	Cwts.
Phosphates, &c.	12	8
„ with 10 cwt. of rapecake	13	4
„ with 3cwt. sulph. ammonia	12	5
„ with 10 cwt. rapecake and 3 cwt. ammonia ..	12	4

“Still, though both experience and experiment in the south of England are in favour of giving phosphates only to turnips, and of reserving nitrogen for the corn crop, it would be rash to assert that our northern farmers are wrong when they use guano; and deference is due to their experience also. We find, indeed, that ammonia sometimes thins the plants, and that it produces the growth of leaf rather than bulb. Possibly, from our necessarily late season of sowing, that excess of leaf has not time to mature the weight of bulb, while

the cooler skies of the north allow it to ripen by permitting an earlier sowing. Be that as it may, I thought it right to try nitrate upon turnips this year, in order to ascertain whether, in case of need, it might become a substitute for guano with this crop also. Guano itself, however, was not used in the comparison, because that being a compound substance, the experiment would have been more complicated. All that I wanted to know was whether the nitric acid of the salt would act upon root crops like the ammonia of the bird's dung; since if this were so, the other constituents of guano might be easily added. The nitrate and the ammonia were applied in equal quantities, and they acted exactly alike; so much so, indeed, that though very small doses of each were applied through the water-drill, they both seemed equally to have killed all the seed. However, some stragglers came up, sufficient to fill the rows, which grew very slowly at first, but became luxuriant afterwards, and certainly would have gained bulk for another month if they had not been stopped by a November frost. No difference could be seen in the action of the two manures, and the test of weighing showed their effect to have been nearly identical.

	Swedes per acre.	
	Tons.	Cwts.
No manure	16	8
Nitrate, 160 lb.....	20	8
Ammonia sulph., do.....	20	1

“The result of the whole comparison appears to be this: For grass land, saltpetre is equal to guano if a small quantity of phosphates and perhaps of potash be added. For wheat, it is probably inferior to guano if applied in autumn, because more liable to be washed down by rain, but preferable if used in spring, because less liable to evaporation in drought, and spring is apparently the best season for giving purchased manures to wheat. For turnips, superphosphate is superior generally to either guano or nitrate, and has the great advantage over both that it can be used with the water-drill, and that, being so used, it gives us in the south a rapid growth, which makes up for our late seed-time; but if nitrogenous matter be also required, we now know that nitrate can be spread broadcast over turnip-land as successfully as guano itself. We have therefore found a substitute for guano in the three great departments of husbandry—the culture of grass, of roots, and of corn.

“The comparison of nitrate with guano is even more important this year than it was a twelvemonth ago. Then our object was to lower the price of guano by bringing into competition with it another article not sold under monopoly. Now, the recent survey of the Chincha Islands shows that we have to fear a rise in the price of guano preceding a

total cessation of the supply. The possession, therefore, of an equivalent is more desirable; and now that we have found that equivalent, the increased supply of cubic saltpetre is more urgent, and to that point the enterprise of our merchants must next be directed. This salt we know occupies the surface of a plain 150 miles long, the Pampa of Tamarugal, separated by only ten miles from the Pacific. Unfortunately, however, those ten miles wear so rugged a surface, that, although a railway is being constructed from the port of Iquique to a height of 3000 feet inland, it cannot be continued to the refinery; so that the coals for refining the salt, and the salt when refined, must still be carried on the backs of mules to and from these southern Salitres. But to the north of Iquique is the mouth of the river Pisagua, which skirts the Pampa not very far from the northern Salitres, affording of course a level line for a railway in the direction required. On the south, again, the river Loa offers the same facilities, passing near some newly-discovered nitrate beds. All these sources, however, have unfortunately one common defect—they are subjected to the same government which owns the guano islands, the government of Peru. But Mr. Bollaert, our main authority, informs us that nitrate is also found higher up the river Loa in the desert of Atacama, which belongs, I believe, to the rival government of Bolivia. It is further stated, though in a less authentic manner, that saltpetre plains

exist to the west of St. Luis de Potosi, in Southern Mexico, with water communication to the Atlantic. In all those remote regions inquiry has been set on foot through the resident consuls by Lord Clarendon, and their answers will be communicated to our society; but in the meanwhile the Liverpool merchants, who have been naturally eager to share in the guano trade, should not neglect to make exertions of their own in these more promising fields. Whether they fetch us guano or nitrate, we are now assured that they supply our land with the same manure, differing indeed in name and in form, but identical in substance and virtue. Such is the solid result established by chemistry, and thus I hope to have made good what I ventured to assert in the outset—that abstract investigation may sometimes serve to guide us safely amid practical difficulties.”

Such are the extensive and remunerative requirements of the English farmer. He now lays under contribution the most distant lands, and draws his supplies of artificial manures from not only the islands of the Pacific Ocean, but from the tablelands of the Andes. These demands have successfully set contrivance and ingenuity to work at home, and there is every reasonable probability that the time is not far distant when the discoveries of the chemical philosopher will render the farmer no longer dependent upon foreign countries for a supply of nitrogenous manures.

NORTON AND BORIE'S ILLUSTRATED CATALOGUE.

PUBLISHED BY NORTON AND BORIE,

UNION WORKS, NEW PARK STREET, SOUTHWARK BRIDGE, LONDON.

We have often had the pleasure of noticing the various catalogues of drain tile and brick machines, &c., of the various exhibitors at the meetings of the Royal Agricultural Society; but the subject of our present notice is that of the above firm, who, although they have for many years now been labouring successfully in the brick-field, having carried off two prize medals in the Great Exhibition of 1851, in Hyde Park (one being awarded them by Jury vi. for their machine, and the second by Jury xxvii. for its products, tubular bricks), have not yet entered the ring with our Claytons, Scraggs, Whiteheads, &c., at our annual exhibitions—a circumstance much to be regretted, but one which we hope soon to see obviated.

Norton and Borie's patent machinery for making tubular or hollow and solid bricks, burnt clay mouldings, cornices, columns, chimney pieces, skirting, tubular and solid roofing, paving and

flooring tiles for houses, stables, houses for cattle, sheep, pigs, and poultry, draining pipes, &c., &c., was first published in France, and subsequently in this country, and has met with the general approbation of engineers, architects, builders and others interested in both. Its chief characteristics are economy of clay and coals, by means of hollow or perforated products, and improvement in the manufacture of the clay, by means of peculiar screening apparatus called “epurating plates,” along with effective pugmills; the grand object of the whole being “the best article at the lowest price.” Following the example of the Crystal Palace of 1851, we shall notice the machines and their products separately.

Machines are of three kinds—pugging, moulding, and brick pressing, with a combination of these three forming a fourth.

Plate first gives a representation of their prize

medal machine of the Great Exhibition, with a pug-mill in the distance. The former is a hand machine of double action, represented as discharging, horizontally, draining pipes at the one end and tubular bricks at the other. It is wholly composed of iron, moves on wheels in the usual manner through the yard; has many ingenious additions about it, such as "springs" and "improved excentrics," in connexion with the lid, "with brakes for warning the workman against negligence, besides the "epurating plates" which we shall notice separately, and turns out from 4,000 to 8,000 bricks or two-inch draining pipes per day.

Plate second represents a similar machine, but with curved chambers at each end, in the process of moulding vertically large bricks for columns, and is driven by steam or other power. These curved chambers may be separated or attached at pleasure, and are capable of turning out a pipe of two feet and upwards in diameter, with other articles of equally large dimensions.

Figures 3 and 4 represent two pug mills, the former of the usual kind driven by one horse, the latter by two horses, yoked with gearing as in the case of thrashing machines. It has also cylindrical crushing apparatus, &c.

We give a copy of figure 5, which will convey a better idea of the machine represented than any verbal description. The poor fellow with the clay barrow on the left is descending rather an abrupt inclination, but in practice this could easily be obviated by a little longer plank. The object of the machine, it will be perceived, is for "rough moulding solid bricks ready for the press." This is accomplished by adding dies and tables to the bottom of the pug mills. The pugging of the clay and the rough moulding of the bricks being performed at one time.

No drawing is given of the "brick-press," which is much to be regretted, as it is a very ingenious piece of mechanism. The mould in which the bricks are compressed has a moveable bottom on the top of a vertical screw wrought by a lever horizontally, like a capstan. Other two levers, acting vertically, and wrought by the foot, release the top when the brick is pressed and to be removed.

The "epurating plates" or screens, already mentioned, are metallic gratings, having the openings of a conical or pyramidal form. The bars between the openings are wedge or knife shaped, having the back to the piston and the sharp edge to the die; and hence the openings are not so liable to be choked or filled with stones, as when of any other form.

It is but proper to notice that we have selected the above drawing, not because it represents the best machine, but because it gives a fair representation of the first tile-making machine ever invented

in this country, we believe, about 20 years ago, by Mr. Murray, manager to the Garnkirk Coal Company, near Glasgow (see the Quarterly Journal of Agriculture, for July, 1853); and farther, because it involves a very important combination, that of pugging and moulding together, which bids fair to supersede all others in large establishments, and therefore it may be a fair representation of what may eventually be the only machine in use, all alterations being in the interior. Our readers are aware of the various machines of Etheridge, Whally, West, and Jones, on this principle, and that the latter two have met with considerable success. In both, the clay from the pit is thrown into the one end of the machine, and taken out at the other bricks or pipes. This is obviously a move in the right direction, one occupying more ingenious minds than one at present, and although we are not authorised to say so, it is not likely that the firm of Norton and Borie will sit still and let the rest of the world go past them in improvements of this kind.

All the drawings have prices attached; and epurating plates, tables, curved chambers for large articles, &c., &c., are priced separately, a great recommendation to the catalogue.

The second division of our subject, the product of the machines, is not the least important of the two. The catalogue enters at some length into the comparative merits of tubular and solid bricks, quoting some interesting examples in favour of the former. In Paris, for instance, two hollow bricks of the common size were loaded with a weight equivalent to a column of the same kind of bricks 2190 feet in height. They sustained this enormous weight for many days without sustaining any injury, being as free from crack or flaw when unloaded as before. Another important experiment, or rather series of experiments, was made at Paris, in order to test their value in the formation of arches, with similar results to the above. They have again been used and approved of, for inside walls and partitions in the *Palace of the Tuileries* and the *Elysée Nationale*; inside partition and facing walls, *Bank of France*; walls from the ground, *Palace of Justice*, and in various military buildings throughout the empire; besides 11,000 square yards of arches at one of the principal railways in Paris. In the British capital again they have subsequently passed through a similar ordeal of tests and experiments with equal success.

The use of hollow bricks is fast gaining ground. A few years ago, we do not recollect of seeing one in this great metropolis, though in herself a world of brick and mortar; but now they are everywhere, being used from Woolwich to Richmond, and from Hampstead to the Crystal Palace, Sydenham. In the neighbourhood of Norton and Borie's brick-

works, Copenhagen Fields (adjoining the New Metropolitan Cattle Market), we observed large ranges of houses being built almost entirely with them, and many single houses with nothing else.

A few of the many advantages of hollow bricks are pointed out in the catalogue, and may be enumerated thus—Half the quantity of clay is only required, so that they are but half the expense of carriage, and also half the weight over doors, windows, and other openings. They are about one-third less expense in burning; lighter to handle in the making, burning, loading, and building; and from the heat getting to their interior, they are generally better burned, and hence more impermeable to moisture and frost, and therefore stronger and more durable. And besides these recommendations, they are warmer in winter, cooler in summer, and more impermeable to sound. In Norway, Sweden, Russia, our North American colonies, and other cold regions, double windows are used. Two panes of glass, with six inches between them, are worse conductors of heat or frost than were the windows of solid glass six inches in thickness. Hence the value of perforated bricks in all cold latitudes. In our own northern isles, where the cold is to a certain degree mitigated by oceanic influence, the inhabitants many of them are literally drowned in their houses, for during winter it rains almost for ever “cold rains,” of which we know but comparatively little; consequently walls become in a very short time so soaked with rain, that the water may be seen flowing down the inside in streams. In many such cases, it is almost impossible to keep exposed houses dry, however carefully the walls are built; for many stones are so porous, as to act as a filter. Heavy expenses are frequently incurred to keep the better class of buildings dry, but to no purpose; for after ail has been done to avoid the unsightly appearance of slating from the foundation upwards, this alternative has at last to be resorted to. In such cases, the hollow brick would be invaluable; for with the perforations vertical, it would literally be thorough draining the walls.

The conclusion that hollow bricks are stronger and more durable than solid ones may be queried, but the proposition is susceptible of very easy proof, for the quantity of matter in a hollow brick has not to sustain a greater weight than the matter in a solid one, while its quality and configuration are scientifically better disposed to bear it.

The bones of animals are an illustrative example of this; for were the quantity of matter in them compressed into a solid form, they would break down under the weight of the carcass. The tubular bridge is another example. It may further be said that hollow bricks require finer clay and better manufacture, before they can be successfully

turned out—granted; but to cram any sort of stuff into a mould that will stick together has nothing to do with the science of brickmaking: superiority in the manufacture of raw materials is what Norton and Borie very justly observe to be the masterpiece of the art. This department of the brick-yard has hitherto been too much neglected, and they point out in proper terms the practical method of enforcing a thorough reformation, railroads and light bricks rendering fine fields of clay in the country available for the use of towns.

More art is required in making and building hollow bricks than solid ones, especially when perforated horizontally as those of Norton and Borie; for the latter are made in one mould, but the former require two dies, besides corners, &c., one for “headers,” and the other for “stretchers”—headers being perforated laterally, and stretches longitudinally. To illustrate this, we give a few drawings, comprising a solid compressed brick (2 a); two hollow *stretchers* (13 a) and (13 c); two hollow *headers* (13 b) and (13 d); and a section of a garden wall (D) showing the method of building.

The “common sized, solid grooved, pressed brick (2 a) is first rough moulded, as formerly stated; four moulds in one die plate, as seen expressed from the bottom of the pug-mill, and then placed in the brick-press which produces it, as seen in the drawing. The common sized grooved stretcher brick (13 a) is also moulded four in one die plate, with three perforations, by the first machine noticed; and (13 b) the common sized, grooved-header brick, two moulds in the die plate with six perforations. The remaining two (13 c) and (13 d) are double size stretcher and header bricks, two of the former in one die plate, and one of the latter with double the number of perforations in each. In the section of the ten-inch wall (D), the stretcher bricks have only two perforations, and the headers four. Two stretchers are under the coping, resting on a header, and so on downwards.

Numerous other drawings are given of bricks of all sizes and shapes for outside and partition walls, for arches, and also sections of walls, illustrating different methods of building. Likewise various plans of “noiseless and fire-proof, tubular brick floors,” one of which we give as an example (No. 44).

In flooring, paving, roofing, and ridge tiles, there are various illustrations, two of which we give, viz., a flat roofing solid tile (No. 70), and five hollow ones (No. 82), with the lower ends of the perforations closed, showing the method of tiling; and also a barn, where the perforations of the tiles are open (No. 84). The barn and method of thrashing is somewhat old style, but these can be improved.

When the world is free of prejudice there will be

no obstacles to progress, but until then what is it which some will not object to? That hollow bricks, roofing tiles, &c., will experience a vast amount of prejudice, is no more than reasonable to suppose, but that they will ultimately triumph over obstacles of this kind requires no demonstration from what has already been said. A lively interest is now everywhere elicited, as to improved cottages for farm labourers, and that hollow bricks are supereminently adapted for such must appear manifest to our readers. For the walls of dairies again, and indeed every building where heat is wished to be excluded during summer and cold during winter, they are equally well adapted. That they would form warm garden walls is plain, for heated air might be thrown into them if necessary. We prefer slates to roofing-tiles, with other modes of ventilating the interior of roofs; but where tiles are to be used, the hollow ones are preferable to the solid. The mode of joining them, as shown in the examples, may be objected to; but moulds can be made of improved forms to almost an indefinite extent. In the moulding of every article, experience has doubtless much to learn before the hollow system is perfect. All have an apprentice fee to pay, and so have the manufacturers of tubular bricks and tiles.

In the draining department, there are upwards of 70 illustrations, all of them less or more interesting, besides a valuable chapter of theoretical matter, both worthy of a more detailed notice than our present limits will admit. We give two examples (No. 110 and No. 137), the former of the ordinary kind, and the latter a new proposition relative to the shape of the pipe—liable to objection we fear; for “if water is allowed to flow outside the pipe, as here proposed, on each side, it will soon undermine and empty the principal water way in the middle, eventually sealing the fate of the drain.” We have seen holes scooped out, large enough to bury an ox, in similar cases to this, and this will not be found an exception.

In this notice we have made no comparisons with other parties' machines and their products. Suffice it to say on this point that we give the Messrs. Norton and Borie every encouragement to enter the show-yard of the Royal Agricultural Society, the fittest place for testing comparative merits and bringing their machines practically before the agricultural public; and in the meantime recommend their illustrated catalogue to those having brick and tile yards, or who may propose opening such. The hollow brick system is deserving of their most serious consideration.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A MONTHLY COUNCIL was held at the Society's House, in Hanover-square, on Wednesday, the 1st of February. The following members of Council and Governors of the Society were present:—Lord ASHBURTON, Vice-President, in the chair; Earl of Yarborough; Lord Berners; Lord Southampton; Lord Portman; Hon. A. Leslie Melville; Sir John Villiers Shelley, Bart., M.P.; Mr. Raymond Barker; Mr. Barnett; Mr. Hodgson Barrow, M.P.; Mr. Barthropp; Mr. Bramston, M.P.; Mr. Brandreth; Mr. Burke; Mr. W. G. Cavendish; Colonel Challoner; Mr. Evelyn Denison, M.P.; Mr. Druce; Mr. Gadesden; Mr. Garrett; Mr. Brandreth Gibbs; Mr. Grantham; Mr. Hamond; Mr. Fisher Hobbs; Mr. Hornsby; Mr. Hudson (Cisleacres); Mr. Jonas; Mr. Kinder; Mr. Miles, M.P.; Mr. Mainwaring Paine; Mr. Rigg (Chester-place); Mr. Silifant; Prof. Simonds; Mr. Slaney; Mr. Smith (Exmoor); Mr. Thompson (Kirby Hall); Prof. Way; Mr. Wingate; and Mr. F. Woodward.

FINANCES.—Mr. Raymond Barker, Chairman of the Finance Committee, laid before the Council the Report on the Finances of the Society, from which it appeared that the current cash balance at that time in the hands of the Bankers was £2 293. The Chairman explained that this general balance included the subscription of £1,500, transmitted to the Society by the Authorities of Lincoln, as a contribution towards defraying the

expenses of its ensuing Country Meeting, to be held at that city in the third week of July next. He also laid on the table, for the information of the Members, the usual quarterly balance-sheets, showing the state of the finances in their particular branches of account.

VETERINARY INSPECTION.—Mr. Raymond Barker then proceeded, as Chairman of the Veterinary Committee, to report to the Council the circumstances under which applications had been made, and visits of inspection authorized, in reference to the outbreak of disease in the herds of Cattle belonging to Members of the Society; and he laid before the Council the special report of an inspection Professor Simonds had made of a portion of the Duke of Richmond's cattle at Goodwood. This report was directed by the Council to be read at their next weekly meeting.

LINCOLN MEETING.—Lord Ashburton, as Chairman of the General Lincoln Committee, read to the Council a report of the satisfactory progress made to that time in the arrangements for the ensuing Country Meeting. These consisted in the preparation of the land for the trial of field-implements, the clearing and levelling of the site for the Showyard, the instructions issued to the Contractor of Works to proceed to a certain extent in preparations for the erection of accommodation for exhibition in the Showyard, and in the early transmission of the local subscription in reduction

of expenses connected with the meeting. On the motion of the Earl of Yarborough, the name of Mr. Torr, of Aylesby, was added to the list of the general Lincoln Committee.

IMPLEMENTS.—Colonel Challoner, Chairman of the Implement Committee, reported to the Council the progress made by the Committee in the consideration of their recommendations on the subject of the future Prizes to be offered by the Society in its Implement Department, and of the best mode in which the construction and operation of the implements and machinery at its Country Meetings may be rendered most interesting and instructive. The Committee requested leave for a Special Council to be held on that day fortnight, for the purpose of receiving and discussing the Committee's final report. This request was granted by the Council, and orders given for the special meeting to be summoned accordingly.

REDUCTION OF EXPENDITURE.—On the motion of Lord Portman, seconded by Sir John Shelley, the following motion, of which the Duke of Richmond had given due notice, was carried, namely, "That a Special Committee be appointed to confer with the Finance Committee, on the best means to be adopted for a reduction in the expenditure of the Society, especially in its Country Meeting department;" and the Duke of Richmond, Lord Portman, Mr. Miles, M.P., Mr. Garrett, Sir John Shelley, Mr. Sillifant, Mr. Thompson, Mr. Woodward, and Mr. Brandreth Gibbs, were requested to form such Special Committee, and to commence their meetings at twelve o'clock on the following day.

FINES.—The Council re-appointed the Committee of last year to report on the circumstances connected with the Non-payment of Fines due from parties who made entries and engaged accommodation for the Gloucester Meeting: but who failed either to exhibit according to their entries, or to send due notice of such Non-exhibition.

TRUSTEE.—The Chairman gave notice, that agreeably with the standing regulation of the Council, the vacancy occasioned in the list of Trustees by the lamented decease of the Hon. Robert Henry Clive, would be filled up by election at the next monthly meeting of the Council.

FARM-POULTRY.—Mr. Fisher Hobbs, Chairman of the Farm-Poultry Committee, laid before the Council the various suggestions offered by the Judges in that department at Gloucester, in reference to the Prizes and Regulations in that part of the Show at Lincoln, and requested that the Committee might be allowed to report finally on the subject on that day fortnight. On the motion of Mr. Hobbs, seconded by Mr. Brandreth Gibbs, it was resolved that a distinct Steward of Farm-Poultry should be appointed, one part of whose duties it should be to attend to the delivery of the birds to their respective owners after the termination of the Show.

CONDITIONS AND REGULATIONS.—The Council decided on the conditions of the Prizes, the rules of adjudication, and the regulations for the exhibition of Cattle, Horses, Sheep, and Pigs, at the Lincoln Meeting, and ordered them to be included in the Live-Stock Prize-Sheet for that Meeting, to be finally completed and dis-

tributed after the settlement of the Poultry Prizes and regulations had been arranged on that day fortnight.

SPECIAL PRIZES.—On the motion of the Earl of Yarborough, seconded by Lord Berners and Mr. Woodward, the offer of Special Prizes for the owners of Hunters and to the breeders of Improved Lincoln Sheep, to the amount of £100, made by J. J. Tweed, Esq., Mayor of Lincoln, was accepted by the Council, and ordered to be included accordingly in the Prize-Sheet for the Meeting.—The Hon. Leslie Melville submitted, on the part of the Local Committee at Lincoln, an offer of Special Prizes for Wool, to be shown at the ensuing Country Meeting; and which was also accepted by the Council, and referred to the General Lincoln Committee.

COMMUNICATIONS from Viscount Palmerston, Mr. Erle, Mr. Matthews, Messrs. Lawson and Sons, Mr. Lister Maw, Mr. Beards, Lord Berwick, Mr. Milward, and Prof. Simonds, received the due consideration of the Council.

The Council then adjourned to Wednesday, the 8th of February.

A WEEKLY COUNCIL was held at the Society's House in Hanover-square, on Wednesday, the 8th of February, present—Mr. RAYMOND BARKER, Vice-President, in the Chair. Mr. Hodgson Barrow, M.P., Mr. Bullen, Mr. Caird (Baldoon), Dr. Calvert, Mr. Dent, M.P., Mr. Dyer, Captain Edman (from Sweden), Mr. Flack, Mr. Foley, M.P., Mr. Fuller, M.P., Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Rev. Henry Knatchbull, Mr. Majendie, Mr. Mainwaring Paine, Mr. Parkins, Mr. Pocock, Prof. Simonds, Prof. Solly, Prof. Way, and Mr. Woodward.

VETERINARY INSPECTION.

The following Report from Prof. Simonds, the Veterinary Inspector of the Society, on an official visit paid by him to a portion of the Live Stock of his Grace the Duke of Richmond, at Goodwood, by direction of the Veterinary Committee of the Society, was received from the Monthly Council and read at this weekly meeting:—

I have to report that, in accordance with the instructions of the Chairman of the Veterinary Committee, I proceeded on the 30th ult. to Goodwood, the seat of his Grace the Duke of Richmond, to investigate a disease existing among some oxen belonging to his Grace. It appears that the animals in question had been purchased with some others, since destroyed by the disease, on the 4th of September last, at Barnet fair. At the time of purchase, as also when they arrived at Goodwood four days subsequently, they seemed to be in perfect health. The original lot consisted of forty bullocks of the Highland breed, varying in age from two to three years; at the time, however, of my visit, their number was reduced to twenty-four by the fatality of the malady. Although there is no direct evidence to prove that the animals were diseased when bought, I have little doubt that such was the case, *firstly*, from the chronic nature of the affection; *secondly*, from the non-existence of any similar disease in the neighbourhood; *thirdly*, from the non-application of the ordinary exciting causes of such a malady after purchase; and, *fourthly*, from the early occurrence of illness among the animals after arriving at Goodwood. The fatality of the disease, as well as the symptoms presented by the animals, led to the belief, prior to my visit, that they were

the subjects of Pleuro-pneumonia. By a careful examination, however, I satisfied myself that the affection, although central in the lungs, was not of the precise nature of the one commonly known as Pleuro-pneumonia. From the answers returned to the Society's list of questions, it appears that sixteen of the animals had died between the middle of September and the end of December, and that seven others were then ill, the remaining seventeen being reported as free from the malady. In inspecting these seventeen animals, I, however, discovered that two more of them had contracted the disease: and these I caused to be immediately removed, that they might be placed with the infected, and forthwith subjected to medical treatment. To a non-medical observer these two bullocks gave no evidence of the malady; one of them, however, has since died, and a portion of its lungs, extensively diseased, was forwarded to me at the College a few days since. The emaciated condition of the diseased animals, the nature of their malady, and the length of their illness, afforded but little hope of the speedy cessation of the fatality by the adoption even of the best remedial measures. This opinion was expressed to his Grace, and it has since received confirmation by the death of two more of the animals. It is also more than probable that other deaths will yet take place; but still I feel assured that by the measures which are advised, a limit will soon be put to the further extension of the disease, and that several lives will be saved which otherwise would have been sacrificed. As is often the case, an immediate good effect appeared to attend upon a change of treatment and management, for at the end of a week from my visit I received a report from his Grace's bailiff, in which he says, "I am happy to state that the bullocks are going on favourably. They were altered as to feeding and management according to your directions, and from their improved appearance I am in hopes that they will now do well without much further loss." In the former part of this report I have observed that the malady showed itself very soon after purchase. To this has to be added, that its progress has not been uniform, and that the deaths have taken place at irregular intervals. Fortunately, from the first, isolation of the diseased was strictly enjoined, so that none of his Grace's other cattle have sustained any injury. Had such a plan not been adopted, it is greatly to be feared that the losses, heavy as they now are, would have been much augmented, as many of the affections of the respiratory organs of cattle are contagious in some stage or other of their progress. Removal of the sick and isolation are therefore of the first importance to limit the extension of many maladies affecting cattle. The progress of the disease, and also some of the more prominent lesions it produces in the lungs and chest, will be gathered from the following statement of Mr. Arras, the bailiff: "The first case," he says, "of the disease took place ten days after the bullocks reached Goodwood. The animal lingered eight days, when it died. On opening it, the chest contained a large quantity of water, and a thickish mass surrounded the lungs. The second case occurred six days after the first. It was more rapid in its progress, the animal dying in five or six days. One lung was enlarged and gorged with blood, the other was only slightly affected. Two more cases happened after an interval of ten more days. These bullocks are still living, but are reduced to mere skeletons. The next two animals both died. The right lung of each was chiefly diseased. In one of these bullocks the lung was hard and of a slate colour, in patches; in the other it was also hard and discoloured, besides containing several tumours filled with matter. The other cases had much the same general character. In one animal the throat and also the air passages were much inflamed; and although the disease did not seem to have affected the lungs, the chest was found to be filled with water." With

reference to the most recent death, and which occurred on the 26th inst, Mr. Arras writes: "Another of the bullocks was found dead this morning. It is one of the two which you took from the supposed healthy when you were at Goodwood. The man who opened it says that the lungs were firmly grown to the ribs, and that nearly three gallons of water came out of the chest. I have given directions for a part of the lung to be sent to you." From these statements it is very evident that the disease has varied somewhat in the nature of the lesion it has produced in the lungs. In several of the cases it has destroyed the animal by copious effusions of serum into the cavity of the chest, but in others the substance of the lung, to a greater or less extent, has been principally diseased. In the specimen received at the College the lung tissue was destroyed in patches from chronic inflammation, while the surface of the organ was covered with effused lymph, the result of recent and acute inflammation of the pleura. The extension of the inflammatory action from the substance to the surface of the lung is sure to produce effusion; and when large quantities of serum are suddenly thrown out, then death will result, and almost immediately, from asphyxia. This explains the somewhat unexpected death of the last animal, and it constitutes the main danger which attends upon those now diseased. The prevention of these effusions, by combating the pre-existing disease of the lungs, is therefore one of the leading principles of the treatment which is being adopted. At the commencement of the malady the animals had not the care of a veterinary surgeon, but of late they have been attended by Mr. Dawtry, of Chichester. On the occasion of my first visit I saw Mr. Dawtry, and explained to him the opinion I had formed of the nature of the disease, and the principles which should guide him in effecting its cure. I also gave instructions for the management of the animals, which seemingly were not diseased, with a view to their preservation. These instructions, slightly modified by circumstances which have since arisen, have been fully carried out, and the results up to this time are as favourable as could have been anticipated, when the duration of the malady, and the importance of a healthy state of the organs in which it is located, are taken into consideration.

JAS. B. SIMONDS, Veterinary Inspector.

Jan. 30th, 1854.

In reply to the inquiries of Mr. Fisher Hobbs, Mr. Pocock, and Mr. Woodward, Prof. Simonds stated that he considered that the greater part of these animals would have died had not the change of treatment he recommended been adopted. They were not affected with the disease commonly known as pleuro-pneumonia, but with that common inflammation of the substance of the lungs which so often results in the case of animals which are injured by over-exertion and exposure. The leading symptoms were loss of appetite, staring coat, coughing, discharge of mucous matter from the nostrils, difficult respiration; effusion of water in the chest ensuing in about eight days. The treatment he had adopted consisted in the administration of a saline aperient, followed by diffusible stimulants, aided by tonic medicines, nutritious food, and well-ventilated sheds. In answer to a distinct inquiry by Mr. Fisher Hobbs, Professor Simonds added, that, under similar circumstances, the same treatment might in general be adopted with the probability of similar beneficial results.

INOCULATION FOR PLEURO-PNEUMONIA.

The Secretary informed the Council that he had received by that morning's post a communication from

Turin on the subject of inoculation for pleuro-pneumonia, addressed to the Society by Dr. Reviglio, of that city. This was a report read before the Royal Medico-chirurgical Academy of Turin in November and December last; and, instead of being a mere relation of results of experiments, and of different opinions, on the effects of bovine inoculation recorded in the various countries throughout which the fatal malady of pleuro-pneumonia had more or less prevailed, it was intended by its author to be a complete discussion of that intricate question, for the purpose of obtaining, if possible, more logical deductions, scientific explanations, and a probable theory from the whole of the facts connected with it. Dr. Reviglio's conclusions are given as fully condemnatory of the inoculation proposed by Dr. Willems, of Hasselt—that hypothesis being deduced, as Dr. Reviglio believes it, from erroneous data and analogies, and therefore destitute of any scientific foundation, its application conferring no specific preservative virtue against the assumed pneumonic virus: on the contrary, that the beneficial effects in any case obtained from this inoculatory process have resulted not from the specific action of a special virus, but from opportune and sufficient counter-irritant influence or artificial irritation, excited by the introduction of morbid or medicinal matter into the animal tissues which are the immediate seat of their insertion, and diffused in those which are contiguous to or continuous with them; the administration of saline purgatives, and the adoption of effective means for giving impulse to the general vigour of the animal constitution, concurring with such counter-irritation in the system in producing those beneficial effects which have been supposed to result from the process of inoculation by an imaginary virus.

OILCAKE.

Professor Simonds took that opportunity of submitting to the Council a specimen of oilcake that had been sold as food for cattle, but which had produced on the animals that had partaken of it in sufficient quantity all the effects of a virulent and rapid poison. Professor Simonds laid before the Council the following communications on this subject, made to him by Mr. Charles Sayles, Veterinary Surgeon, Tickhill, near Rotherham:

“January 7, 1854.

“I beg most respectfully to submit the following cases to your notice, together with a piece of mustard-cake, which I hope you will have received at the same time with this. On Thursday, the 5th inst., four horned cattle, the property of John Foster, Esq., of Newhall, three drapes, and one milch cow, all in apparent good health, living upon the same food as the rest of the cattle, were in the afternoon allowed a portion of the cake, which is a new material said to be from mustard seeds, intended for fattening cattle; three of them having an equal quantity—perhaps from four to six pounds each, the milch cow, fortunately, not more than half the quantity. On the following morning (Friday), two of the drapes were found dead, and a third—I have not the least doubt dead before this—was found in an agonizing state, tumbling and rolling about just as a horse would do, having sharp colicky pains. To this one and the milch cow I gave a large dose of oil with opiate ether, yet not with the least hope for the recovery of the drape. The *post mortem* appearances presented the most intense inflammation, which had penetrated the whole substance

of the stomachs, and also some portion of the intestinal canal; large lymphous bands thrown out, and attaching themselves to the peritoneal coverings, with very extensive effusion of fluid into the abdominal cavities. The interior of the stomachs were of a rose-pink colour, their coats peeling off from the least touch—in fact, in the abomasum and manifolds their coats had been thrown off, adhering to their contents, which were well comminuted for the natural or healthy digestive processes. Having, Sir, given you a description of the state of these animals, and sent also a sample of this said-to-be mustard-cake, I have now to kindly solicit the favour of your opinion at your earliest convenience, as to whether you consider these cattle destroyed with this material, and if so, to have the kindness to state the destructive principle it contains, which will not only be conferring upon myself a high favour from your well-known abilities and assiduous researches, but will also be an important decision to the owners of cattle, who may be wishful to use this agent for fattening their stock at this period of the year. I just state that I do not know that this new article has been used by any other party than the one in question. You are, Sir, at liberty to make what use you may think proper of this report, together with my name.

“I find in Thompson's *London Dispensatory*, page 502, the following quotations:—Mustard seeds contain a very acrid volatile oil, united in the seed with fecula or starch: its force, that is its acridity, appears to be obtunded by a soft insipid fixed oil, which oil is separated by pressure, and the cake left after the expression is considerably more pungent and acrid than the unpressed seeds: it is not dissipated by drying or keeping the seeds. With lime and a few drops of water, ammonia is plentifully evolved. The constituents of these seeds appear to be starch, mucus, a bland fixed oil, an acrid volatile oil, and an ammoniacal salt.”

“January 14, 1854.

“In answer to your kind favour of the 10th, which I duly received, and wherein you desired a greater quantity of the cake for further examination, I yesterday arranged with Mr. Foster, to furnish you with three cakes, and to send them per rail, which has been done. I have also ascertained at Doncaster to-day that they are of home manufacture, yet the ingredients are of foreign importation. After your testing the qualities of this composition, I shall feel happy to hear from you. Should any fresh cases occur from this pernicious agent, I will communicate them to you. Accept my kind thanks for your attention.”

“February 2, 1854.

“I trust you will pardon my seeming neglect in not writing you earlier. My delay has arisen from the desire to give you any other, or rather the whole of cases either producing illness, or ending in death, from the mustard-cake. Two other cattle have died since I wrote to you, belonging to another person; which are the whole of deaths occurring from this agent. The firm by whom it was sold have stopped any further sale of it as an article of food; and if it be sold at all, it goes into the hands of the farmer as a fertilizer, or warm land tillage, which was its original purpose; that is, manufactured for that purpose only, yet incautiously used as a cheap food, without giving any thought as to its properties. With the former three which I gave you belonging to Mr. Foster, and the two I name, makes five deaths out of six animals. These, I believe, constitute the whole instances. I shall feel glad to hear from you if you have made any experiments upon the material, and perhaps you will do me the favour of giving me its analysis. Any cases whatever occurring either upon the horse or cattle which are interesting I will communicate to you—obliged by your kind attention to my letters. Your written opinions on this subject are duly appreciated.”

Professor Simonds stated that he had made experiments at the Royal Veterinary College on the effects of this mustard-cake on two sheep. He had mixed it with chaff and corn, but it was evidently distasteful to them, and they only eat from a quarter to half a pound daily, without producing any decided effects; while oxen which had partaken of four or five pounds a day of it, died in consequence. He had ascertained that the local term "drapes," employed in the communications he then submitted to the Council, was intended to signify "barren cows."—Mr. Fisher Hobbs thought that the thanks of the Society were due to Professor Simonds for the kind trouble he had taken on the subject of this cheap but poisonous "feeding cake," especially as other oil-cakes, expressly adapted for feeding purposes, were now adulterated in a high degree, particularly those of home-manufacture, while the foreign cake at present maintained its average good quality. It was not long ago that Mr. Hobbs had known eight or ten beasts poisoned by eating cake adulterated with refuse bitter-almond cake, and which was consequently impregnated to a certain amount with the prussic acid that substance is known to yield. Bitter almonds were poisonous, as Dr. Fresenius, of Wiesbaden, had remarked, because on mastication there was formed in them an ethereal oil containing two substances separable from each other, namely, prussic acid and pure bitter-almond oil, both of which were poisonous. Bitter almonds and black mustard seed were very similar to each other in their chemical relation: each contained the same kind of acid and the same vegetable principle, neither of which had either odour or pungency; when both of them, however, were united, and water added, a liquor of most pungent odour was formed, which, on distillation, furnished mustard-oil and mustard-water. The same products were also at once obtained on the distillation of flour-of-mustard and water. Mustard-oil had a powerful smell, its vapour violently affected the eyes, and it blistered the skin. Similar sulphurous-etherial oils were furnished by garlic, horse-radish, scurvy-grass, the female hop-blossom, and other plants, or vegetable substances, on distillation with water. Mustard-seed (white or black) yielded about 22 per cent. of fixed oil and 76 per cent. of cake: the burnt ashes of the seed contained about 37 per cent. of phosphoric acid, with about 13 per cent. of alkalies, besides other substances. Bitter almonds yielded about 28 per cent. of fixed oil and 72 per cent. of cake. In reference to the comparative value of cake of the same substance, the Baron Weckherlin had also remarked, that the hydraulic press furnished worse cake than the old ordinary presses, in consequence of its greater pressure leaving no oil, but only bitter matter behind in the cake: and Professor Pabst, of Hohenheim, in reference to inferior or poisonous oil-cake, had stated that the beech-nut cake had been found poisonous to horses, and whether poisonous or not to cattle, it would be injudicious to employ it all, as horses and cattle had frequently the same access to places of feeding. Mr. Fisher Hobbs thought he might make the general remark that "cheap" articles, recommended solely as such, were but too often the dearest the farmer could purchase, the quality of such

articles being frequently reduced in a greater proportion than the price. He hoped our English cake-makers would take warning in time, and not drive the English farmer to seek his best and most economical cake in the foreign markets.—Mr. Woodward fully concurred with Mr. Hobbs in the superior value of the foreign oil-cake: he would also add, that in the case of manures the cheapest were not by any means always the best. He thought the subject one of important consideration for the farmers of the country.—Mr. Caird suggested that the south-country farmers of Great Britain should adopt the same means of safeguard against adulteration in oil-cake, as had been so constantly used by the farmers of the north. In Scotland, no farmer ever thought of making a purchase of oil-cake, any more than he would of manure, until he had been furnished with a properly certified analysis of its quality. In consequence of this simple and obvious precaution, no such thing was ever heard of among the northern farmers as adulterated oil-cake, as no unprincipled vendor had the slightest chance of sale for deteriorated compounds. He hoped the farmers of the southern part of Great Britain would lose no time in adopting a similar efficacious mode of security.

ELASTIC STEEL DIGGING-FORKS.

Messrs. Burgess and Key, of Newgate-street, having obtained the entire agency of the well-known "Winton-Parkes" steel digging-forks manufactured by Mr. Francis Parkes, of Birmingham, transmitted a complete set of these forks to the Society, with the following account of their mode of manufacture:—

5th December, 1853.

Aereable to your request, I proceed to describe to you the origin of steel forks for digging manure and other purposes, and the advantages to the consumer which they possess over every other implement of the kind. I have for many years been tool maker for the majority of the London market gardeners. My first effort to serve them was by improving their spades and hoes; the improvement in the spades consisted of plating the front side, or upper surface of the spade, with cast steel, so as to impart to the implement the property of wearing itself to a knife edge and to a peculiarly bright surface, which scarcely any soil would adhere to. My next effort to improve this article was to shape the iron and steel so as to produce a solid plate or blade, gradually increasing in strength from the edge to the centre, and again wedge-like from the edge to the top or shank, which places the weight of the implement so near the hand, that, although it possesses great weight and force in its downward blow to cut through roots or turf, it does not rise or lift heavily. And there is also a novelty in the mode of joining the wood and iron part of the handle, as you will see by the one which is now exhibited (No. 1). Instead of the iron covering the wood, as in the usual mode of construction, the wood covers the iron; and wood being a non-conductor of heat, comparatively with iron, the implement is much pleasanter to handle during the cold of winter. My next attempt was to improve the three prong dung-fork then in use. Having made some to pattern supplied by Messrs. Fitch, of Fulham, good in shape, but the prongs formed of $\frac{3}{4}$ round iron, tapered a little and pointed, I was dissatisfied with them, as being cumbersome and heavy. I then conceived the idea of making one of steel sufficiently light and well-tempered to be elastic; but being aware that the prong of a fork would be tested far more

severely than sword blade, bayonet, rapier, or anything of the kind, I determined upon selecting a good quality of cast steel, and tempering it as skilfully as my many years of experience would enable me to do, and to make the prongs of such a shape that the end section should be an oblong square, as shown by No. 2, now exhibited, thus offering the greatest resisting power to the strain occasioned by lifting a weight of dung or litter, and giving the more flexible elasticity in the direction that the fork was likely to become wedged or expanded, and was eminently successful—so much so, that Mr. W. Fitch subsequently told me that his man had then a fork in use which he had taken to London with the dung-cart every day for two years, and that it had never cost him one penny in repairs—in contradistinction to the iron forks, which, when in regular use, cost three-pence every fortnight at the blacksmith's shop for pointing—and, to use the man's own expression, it was at that time the best fork that ever was stuck into a pit of dung. I next saw the desirability of making a four-prong fork, for decomposed dung, compost, short litter, and various other purposes. Here arose the difficulty. I had been substituting a fork made of 1½ lbs. of steel for one made of 3½ lbs. of iron; and, to make this good enough to stand its work at such a weight, I had seen in the necessity of making the fork from one piece of steel, without incurring the risk and uncertainty of welding or joining prongs together. Now, in case of a three-prong, this was very simply and readily done, by cutting a piece of steel and partially dividing it into three parts, and then driving out the two outside parts, so as to form it into the shape of a crucifix. The three parts were then drawn out under a till hammer to the desired length and strength to form the prongs, and the out-rides or arms of the cross bent down again in the required shape for a fork. But to form a four-prong fork was a together a different matter. The difficulty was at length overcome in this way: A piece of steel was cut and divided up the middle, and then extended, and the ends partially divided; the two ends were then drawn out under a till hammer, extending the two prongs; the division was then completed, and the two inner prongs forced down into their place. When this difficulty was overcome, and we were able to forge any number of prongs from one piece of steel, subsequent experience has proved to me that forks of any given number of prongs (as the nature of the land may require) are the most efficient digging instruments, and the most durable. Steel being a material susceptible of crystallization, it necessarily becomes pre-eminently durable by crystallization; and such durability is impaired to a very trifling extent only by the subsequent tempering, which imparts elasticity. The elasticity of the fork proves to be singularly advantageous to the operation upon the soil. When the hardness or adhesiveness of the soil, or the intersection of roots, offer more than ordinary resistance, and more pressure has to be applied, as soon as the release takes place the prongs spring forward with sufficient force to disseminate the soil in thousands of particles; or when the workman strikes a clod with the fork in an oblique direction, the prongs—possessing all the vibrating power as seen in the tuning-fork—will disseminate the soil into the minutest particles. It will be obvious that the fine-pointed prongs (as No. 4) must penetrate the soil, under any circumstances, much easier than the edge of a spade, however sharp; and experience has proved to me that there is not any soil in this country—when ordinarily moist, as in the digging season—but will hold together sufficiently to be raised up and turned over by this implement. No. 5 is sufficiently strong for a most adhesive soil. No. 6 is adapted to subsoil digging, and is capable of breaking up concrete. A fork of the same weight as No. 6, with flat prongs, or say these prongs reversed,

is best adapted for a soil where boulders abound. A fork of the shape of No. 6 holds the boulders between the prongs too firmly when they happen to be forced in. No. 7, with either four or five prongs, is best shaped for digging potatoes; the fine-pointed prongs pass through the soil with such facility that it induces a quicker motion of the workman's hand, consequently has more opportunity of bringing all bulbs and fibres to the surface. The old-fashioned flat-pronged potato fork brings the soil forward too much, and buries the rubbish, and, I am quite sure, will soon go out of use. I had a labourer, three years ago, who dug one acre of potatoes in seven days—the land in a very foul state, which he left clean and apparently in fine tilth—with a fork of the precise shape and weight as No. 7. His mode of working was as follows: With the fork he flung the potatoes out all over the surface of the land, not stooping to put his hand to them at all, and with a dexterous movement of the fork he places the haulm and couch grass on one side. He had two children to collect the potatoes into baskets; and in the evening of each day he would collect the rubbish together, passing his many-pronged fork over the entire surface, and left his land as neat as a well-worked garden. No. 8 is a solid bright cast steel draining or bottoming tool, a little more than half the weight of other tools made for the purpose. This tool is used in a four-foot drain, at a time when the cutting is already three feet four inches deep; and the workman has only room to stand with one foot placed behind the other, and has to lift the earth frequently above the level of his own head. Hence the necessity of a light tool, combined with the greatest amount of strength; and the demand made upon you by the public for these implements will show how they are appreciated. FRANCIS PARKES.

The Council ordered their thanks to Messrs. Burgess and Key for this present and communication.

PERMANENT GRASSES.

Dr. Calvert suggested to the Council, that the Society should offer a prize "for the best plot of swarth land, the produce of seeds sown in the spring of 1853, the premium to be awarded in 1860 or 1861; the actual outlay incurred for manures, dressings, &c., as well as quantity and quality of produce, being taken into account as far as practicable."—Mr. Fisher Hobbs objected to the form of challenge in which Dr. Calvert had put his proposal; at the same time he thought the subject of the best grass-seeds known in England was one of the most important that could engage the attention of the Society. He had himself been frequently disappointed in laying down permanent pasture; and he hoped that the selection of the best grasses was a point that would receive the future consideration it so highly deserved.—Dr. Calvert stated that he had for twenty years been engaged in such a selection and cultivation, and he was desirous by the offer of this premium that the value of his results might be tested by public competition.—Mr. Pocock suggested that in the meantime Dr. Calvert would render a great service to the Society if he would put in the form of a report a detailed statement of his experience on this important subject.—Dr. Calvert replied that he should be happy to do so, should time be allowed him for the completion of such an undertaking: he pretended, however, to no such discriminative acquaintance with the varieties of the grasses, as would enable him to describe their differences in a botanical sense; he only laid claim to a long practical experience of their value as objects of farm-cultivation.

GUANO-DEPOSITS.

The Secretary informed the Council that at their next monthly meeting he should have the pleasure of reporting the communication in which he was then placed with Sir James Graham, as First Lord-Commissioner of the Admiralty, in reference to active measures, taken by him as the head of that department, for the discovery of new sources of guano by the officers of Her Majesty's ships cruising on coasts within the rainless regions of the tropics.—The Chairman remarked that the Society had reason to congratulate itself on the fortunate circumstance that the distinguished individual who now presided over the naval department of the Government was not only an excellent farmer himself, but also an office-bearer in the Society's Council, and one of its most active founders and promoters.—Mr. Caird was gratified to hear that Sir James Graham was rendering so great a service to the cause of the Society and of our national agriculture. He thought that for the last few years the influence of our Government had not been sufficiently strong on the Peruvian authorities; as it appeared that, while the guano market in this country was nominally closed, in the United States it was not only open in full vigour, but the subject of successful negotiation by the American Government on the guano supply to that country had been made a point of distinct congratulation by the President in his last Message. He therefore hoped that our own Government also would not hesitate to consider this question as one of vital importance to the agricultural and shipping interests of the United Kingdom. Mr. Caird concluded his remarks by reading the following passage from the Baltimore Price-Current of the 7th of last month:—

GUANO.—As generally anticipated, the importations of the favourite article under this head, Peruvian, have greatly increased during the past year, not only at this port but at other ports of the United States, and we need hardly add that if the government agents had been enabled to supply our market with four times the quantity imported, it would have been readily disposed of. The demand is in fact only limited by the supply, but arrangements having been made by which a far greater quantity may be received in this country than ever heretofore, there is no reason to believe that agriculturists will again be subjected to the inconveniences from which they have suffered so materially within the past year. So deficient has been the supply, notwithstanding the marked increase of the importations, that other descriptions of Guano have been substituted to an unusual extent, and when obtained from speculators, the most exorbitant prices have frequently been paid for them. Recently discovered deposits of this excellent fertilizer have attracted the attention of some of our importers, and there has been quite a considerable quantity of Mexican received at Baltimore during the last three months, amounting in all to about 4,000 tons, including several cargoes from the Caribbean Sea. There have been imported into the United States, during the year 1853, in 107 vessels, 70,530 tons of Peruvian Guano; of which 50 vessels have arrived at Baltimore, and 57 vessels at other ports.

Imports of Peruvian Guano at Baltimore, for the last five years:—

1849..	2,700 tons.
1850 ..	6,000 "
1851..	25,000 "
1852 ..	25,500 "
1853..	32,152 "

—The Chairman was surprised to hear that America should have gained these important advantages, denied to this country: he hoped, however, that such measures would soon be taken as would secure them also to our own farmers as well as to those in the United States, feeling assured that the government of this country was fully alive to the importance of the question in all its bearings.—Mr. Fisher Hobbs was glad to find that the statement made in that room a year or two ago by Captain Stanley Carr, one of their honorary members, who in his way home from Australia had paid a visit to the

guano-fields of Peru and its vicinity, was fully confirmed (notwithstanding the intermediate report made by Admiral Moresby), that there was no fear of an immediate failure in the supply of that valuable manure. He hoped the monopoly which had so long injuriously fettered the guano-supply to this country would at once be broken through, and that ere long we should receive it in the way of ordinary importation, through our friends in the United States of America.

SUBSTITUTES FOR GUANO.

At the suggestion of Mr. Bullen and Mr. Caird, the Council arranged that the subject of fish-refuse and other substances as substitutes for guano, should be taken into consideration on that day fortnight, Wednesday, the 22nd of February, at 12 o'clock.

POTATO CULTIVATION.

The following communication was received from Viscount Palmerston, H.M. Principal Secretary of State for the Home Department, along with a box containing samples of fine potatoes; and the best thanks of the Council were ordered to his Lordship for his kindness in directing them to be transmitted to the society:—

"British Consulate at Fiume, Sept. 30, 1853.

"MY LORD,—I humbly beg leave to address your lordship, at the request of Mr. A. Frangi, a Tuscan gentleman, who is very desirous to lay before your lordship a sample of potatoes, this year's produce, on an experiment of his made from cuttings of diseased ones. As they prove to be of excellent quality, it is of great utility and benefit to agricultural interests that his method adopted to preserve and reproduce a crop of this nourishing food be explained; and, by laying this specimen before your lordship, he trusts you will find an interest therein to call the attention of agriculturists to follow up the experiment, in order to successfully preserve to themselves the means of conserving the seed necessary to insure them a crop of fine farinaceous and almost equal-sized fruit, and at an early period of the year. Mr. Frangi last year finding his stock of potatoes fast decaying from disease, resolved on drying them, and had them placed near to a retort on his chemical works (for he had read in the papers that in Russia something of the kind had been done), and in a dried state he continued the consumption for his house use during the winter; and in the spring, finding a beginning of vegetation, he had them cut up and planted separately from other potatoes, but near thereto. The dried cuttings were rather backward in breaking the earth, after which their growth was manifestly more rapid and luxurious than the other plants. They were precisely treated the same in hoeing and weeding; and on the 25th July were gathered, and produced an abundant and equal-sized potato. The other crop from the common cuttings did by no means produce the like, and have already given signs of decay as before; but not so the produce of the dried cuttings. The soil in which both sorts were planted is of a rather stiff, stony, clayish compost. The spring was very damp, the summer however proved very dry, yet the verdure of the dried cuttings maintained their verdure, which faded and perished with the other kind. Mr. Frangi has forwarded a similar sample of the potatoes unto the Marquis Rodolfi, president of the Tuscan Agricultural Committee, for his information, and he begs your lordship will excuse the liberty he takes in sending his sample, for he trusts your lordship will find an interest in this his experiment, by which the produce of a fine healthy fruit is so far secured to man. He begs a repetition of his method may be made in Great Britain, and he confides as favourable a result will result as here; thereby conserving the means of procuring an abundant crop for the following years of this most-nourishing plant, and must be of great interest to the population of the United Kingdom. I most respectfully beg to inform your lordship that the sample-box is on its passage home in the British schooner, 'Sprightly,' of London, John Paul master, bound to Gainsborough from this port, with a cargo of castles, to be forwarded on arrival.

"I have the honour to be, my lord, your most obedient and humble servant,

"CHARLES THOMAS HILL, Vice-Consul."

The Council then adjourned to Wednesday next, the 15th of February.

A weekly Council was held at the society's house in Hanover-square, on Wednesday the 15th of February: present, Mr. Pusey, President, in the chair, Duke of Richmond, Hon. A. Leslie Melville, Sir John V. Shelley, Bart., M.P., Sir Matthew White Ridley, Bart., Mr. Raymond Barker, Mr. Hodgson Barrow, M.P., Mr. Barthropp, Mr. Bullen, Mr. Caird, Dr. Calvert, Colonel Challoner, Mr. Evelyn Dennison, M.P., Captain Edman, Mr. Eggar, Mr. Foley, M.P., Mr. Garrett, Mr. Brandreth Gibbs, Rev. L. Vernon Harcourt, Mr. Fisher Hobbs, Mr. Horsby, Mr. Magendie, Mr. Miles, M.P., Mr. J. D. Nicol, Mr. Pocock, Mr. Sillifant, Professor Simonds, Mr. Slaney, Mr. Reynolds Solly, Mr. C. Hampden Turner, Professor Way, Mr. Wingate, Mr. F. Woodward, and Mr. Wrench.

GUANO DEPUTATION.—The President took that opportunity of reporting to the Council the result of an interview which the Earl of Carendon granted, on the 10th of December last, to a deputation from the Council, on the subject of a reduction in the price of guano imported into this country. His lordship had given every assurance to the deputation on that occasion, that no efforts should be spared by her Majesty's Government, either in effecting, if possible, the reduction in question, or, on the other hand, of increasing the supply by the discovery of further deposits of that valuable manure in different parts of the world; or of the nitrate of soda along the coast of Peru, Bolivia, and Mexico, ascertaining in each case, the quality, as well as the amount of such deposits. The President stated that Admiral Moresby, in his survey of the guano beds, had taken the quality of the deposit into account in stating the amount of guano suitable for export to England, while the Peruvian surveyor had not drawn this distinction; a circumstance that might explain satisfactorily the different estimates each had given of the amount of guano still remaining on hand, and at the disposal of the Peruvian Government. There was a great difference in the quality of the different guanos, in reference to their respective proportions of ammonia on the one hand, and of the phosphates on the other; and their different market values were affected accordingly. He concluded that the farmers of this country would not be put off their guard by the recent manifesto of the Peruvian Government.—The Duke of Richmond fully concurred with the observation made by Mr. Fisher Hobbs at a recent meeting of the Council, that it would be advantageous for the farmers of this country to purchase their guano of the Americans, and to have the cargoes delivered at a fair remunerative profit at our own ports. If there was to be a free trade in wheat, let there also be a free trade in that article by which the wheat itself was to be grown. The Americans, it appeared, knew how to buy guano, and could get from the Peruvian Government any quantity of guano they pleased.—The President concurred in the views of the noble duke, and considered that there was at present nothing in law to prevent the importation of guano into this country from America. Both he and the Duke of Richmond were fully prepared to try the question by purchasing jointly a cargo of guano at New York, which should be consigned to them at some British port.—Mr. Caird thought the expense of conveying the guano round by Cape Horn to the United States, and thence to England, would too greatly enhance the price to render the purchase an economical one.—The Duke of Richmond never supposed that the Americans would take so circuitous a route in the transaction of their business; the purchase being made at head quarters, the mode of transit might, he thought, be safely left to the Americans themselves.—Mr. Caird then referred to the result of American negotiation in obtaining so advantageous an arrangement with the Peruvian government. They had employed measures that had proved effectual, although it had not at present

transpired what those measures were. He stated that the discovery of bird manure, made a short time ago on the eastern coast of Africa, had it now appeared, on reference, been previously made by a Government surveyor ten years ago; but the fact had lain dormant and neglected in the archives of some Government department till the recent discovery of the very same deposit led to inquiry and reference. This coincidence was instructive in many points of view. He then glanced over the districts from the Orkneys, and the high cold districts of Scotland, to the south, which were capable in a high degree of being changed from a sterile state to that of fertility, by the application of this manageable and effective manure, ready-made as it was to hand, for immediate application to the soil. He could not deny himself also the opportunity of referring to that other valuable manure, the nitrate of soda, of which the nature and mode of action had been so ably and conclusively expounded by their President, Mr. Pusey, in his recent paper in the society's journal. He concluded by hoping that the society would lose no opportunity of pressing upon the Government the importance of decided measures on the guano question.—The Duke of Richmond asked why the second discoverers of the guano, on the eastern coast of Africa, had not gone at once to the merchants rather than to the Government?—Mr. Caird replied, that such had been the case on the discovery of guano on the Ichaboe island, and the consequence was, that the merchants who undertook the speculation were ruined by it, in consequence of the immense outlay of their preparations for the trade, which were rendered nugatory by the simultaneous efforts of rival merchants, who with them soon swept the island of its manurial treasures.—The Duke of Richmond thought the farmers of this country had now a strong claim; they wished to buy guano, there was only one house in this country that had the privilege of supplying it, and that house had announced that the supply, for an indefinite term, had ceased.—Mr. Bullen suggested that American vessels from California might easily be ballasted at Peru with cargoes of guano. He thought the American merchants should be asked to bring the guano to this country in the bottoms of their own clippers.—Mr. Denison, M.P., saw no legal difficulty in American vessels bringing guano to our ports.—Mr. Slaney had no doubt that the time was gradually approaching when such a substitute for guano would be found within our own resources, as to render us independent of the necessity of a foreign importation.—The President agreed with Mr. Slaney, but he thought we had better first get the guano.—Mr. Fisher Hobbs gave notice that he should move at the next monthly Council that the guano committee of the society be requested to meet, for the purpose of deliberating on the interesting position of the guano question at that moment, and of taking into consideration the various suggestions offered to the Council on the subject: he should also at that time move that Mr. Caird, who had so strenuously advocated an onward movement in breaking through the injurious monopoly of guano in this country, should allow his name to be added to the list of the committee.

ECONOMICAL BREAD.—The Hon. Henry Fitzroy, M.P., transmitted to the Council, by direction of Viscount Palmerston, her Majesty's principal Secretary of State for the Home Department, a communication addressed to his lordship by an anonymous correspondent at Calais, on the subject of the economical preparation of bread. This communication contained two modes of effecting this object:—

1. **ECONOMICAL WHEATEN BREAD.**—For the purpose of making this bread, only the coarsest of the bran is to be taken from the wheat; and the second coat, or what is called

pollard, ground with the meal, as is usual for wheaten bread. Five pounds of this bran are to be boiled in somewhat more than four gallons of water, in order that when perfectly smooth three gallons and three quarts of clear bran water may be poured into and kneaded up with 46lbs of the brown flour; adding salt as well as yeast, in the same way as for other bread. When the dough is ready to bake, the loaves are to be made up and baked two hours and a-half in a pretty brisk heat. As flour when thus made up will imbibe three quarts more of this bran liquor than of common water, it evidently not only produces a more nutritious and substantial food, but augments it to one-fifth part of the usual quantity of bread; consequently it is a saving of at least one day's consumption in every week. If this bread were in general use, it could be proved to be a saving to the nation of near ten millions per annum. This bread, too, has the following peculiar property: if put into the oven and baked for twenty minutes, after it is ten days old, it will appear again like new bread.

2. ECONOMICAL BREAD.—In times of scarcity, or when flour is very dear, the price may be reduced by the substitution of a quantity of turnips. Wash clean, pare, and afterwards boil a number of turnips till they become soft enough to mash. Dress them dry, mix them with an equal quantity of wheat meal, and make the dough in the usual manner, with yeast. It will rise well in the trough, and, after being well kneaded, may be formed into loaves, and baked. Bread prepared in this manner will have a sweet taste which is by no means disagreeable. It is as light and as white as the wheat, and should be kept twelve hours before it is cut, when the smell and the taste of the turnips will scarcely be perceptible, but which can be got rid of altogether by using a little carbonate of soda.

The Council ordered their best thanks to be conveyed to Viscount Palmerston for his kindness in transmitting this communication to the Society.

For those parties who are desirous of trying the effect of these manipulations, we give the following references to works where the subject has been already and at different times treated:

1. Parmentier's Essay, which in 1769, the year of general famine, gained the prize of the French Academy, for the best account of substitutes for bread. In this essay, Parmentier recommends a decoction of bran to be mixed with his potato-mel bread, to give greater adhesion to its particles, and bind the whole better together.

2. Mrs. Rundell, in her *Cookery*, gives almost the identical recipe for making what she calls "The Rev. Mr. Hagger's Economical Bread;" her proportions, however, of flour being 56lb. instead of 46lb., as recommended in the Calais communication.

4. Mrs. Smith, in her "Female Economist" remarks: "Economical bread is made in the same manner as other bread, only the water is boiled with a quantity of fine bran in it; when strained off, mix the water with the yeast, and make the dough with it. This method is supposed to save a considerable quantity of flour."

4. In the *Magazine of Domestic Economy*, Vol II., p. 363, it is stated:—"We think that a highly flavoured brown bread should be attempted from 21 lb. of the finest flour, with the addition of one-fourth (6lb.) of second topmug, and made up with bran water; that is with water in which as much bran has been boiled as will allow of its boiling freely for five minutes, and yet to yield the full quantity of fluid required after separating the bran by a hair-sieve. We are sure, from numerous trials with varying quantities of pollard, that there is a very great economy in the process; it yields a much larger portion of bread than the best flour alone, and where it suits the stomach becomes a very valuable article of diet."

5. In James's patent for the manufacture of a very absorbent but good bread, a portion of the flour is in the first instance boiled with the whole of the water which is intended to form dough with the remaining flour.

6. Dr Oitz, of Brunswick, and Professor Weppen, Markol deuder, concur in their opinion of the value of bran, on account of the glutinous and therefore nourishing matter which it contains.

7. The original communication on turnip bread published in the "Museum Rusticum et Commerciale," and given at length in the "Encyclopaedia Britannica," Art. Bread, is evidently the one from which the Calais recipe has been extracted; the latter, however, recommending the addition of carbonate of soda, for the purpose of removing the turnip flavour from the bread. Dr. Fesenius condemns the use of yeast, or turnip roots of every variety, in the manufacture of bread in times of scarcity, on account of the distasteful food they yield, the little nutrition they afford, and the inconvenience resulting; from the conveyance of such roots, with their 80 or 90 per cent. of water, far beyond the locality of their growth.

One of the earliest prizes offered by the society was the one "intended to procure such instructions for agricultural labourers as might enable them to supply themselves with the greatest quantity of nutriment which the means at their command would produce; and to prepare a warm, comfortable, and nutritious meal for themselves and their families, when they return home from their day's work." This prize produced the compilation (with the consent of the authors) from the 50 competing essays, published in the society's Journal (vol. III., page 83), and afterwards reprinted as a separate tract "On Cottage Economy and Cookery," of which, and a similar tract on "Cottage Gardening," the society have had the satisfaction of distributing no less than 30,000 copies throughout the country, at a price (one penny) far below the expenses incurred for the printing and paper.

SOIL-TESTER.—Mr. Fisher Hobbs exhibited to the Council a most convenient tool and farm companion, in the shape of a light steel auger, adapted for the double purpose of drawing up with ease at various depths specimens of the soil, and of serving as a light strong walking-staff, having a hammer handle. This implement had been made for Mr. Hobbs by Messrs. Burgess and Key, from the original brought over to this country by Captain Edman from Sweden, where it was in common use, and where he had himself for the last fifteen years used the identical one then submitted to the Council. Its peculiar point, and its concavity of shaft, enabled it by a single turn on its axis after insertion in the land to bring up the soil, at given distances within its range, as marked by divisions on its stem, in an unmixed state. The hammer head was found useful for many purposes on a farm during the occupier's walks over it.

A SPECIAL COUNCIL was then held, when the following Members of Council and Governors of the Society were present:—Mr. PUSEY, President, in the chair; Duke of Richmond; Hon. Leslie Melville; Sir John V. Shelley, Bart., M.P.; Sir Matthew W. Ridley, Bart.; Mr. Raymond Barker; Mr. Hodgson Barrow, M.P.; Mr. Barthropp; Colonel Challoner; Mr. Evelyn Denison, M.P.; Mr. Foley, M.P.; Mr. Garrett; Mr. B. Gibbs; Mr. Fisher Hobbs; Mr. Hornsby; Mr. Miles, M.P.; Mr. Sillitant; Professor Simonds; Mr. Stanley; Mr. C. Hampden Turner; Professor Way; Mr. Wingate; and Mr. Woodward.

IMPLEMENTERS.—Colonel Challoner, Chairman of the Implement Committee, having submitted to the Council the report of that Committee, the Council decided to offer the following prizes for agricultural implements and machines at the Lincoln Meeting:—

	SOVS.
Plough for general purposes	5
Plough for not less than ten inches deep	5
Draught and tile machine	5
Cultivator, grabber, and scarifier	5
Drill for general purposes	10
Corn and seed drill	10
Drill for small occupations	5

SOVS.

Seed and manure drill for small occupations.....	5
Turnip drill on the flat, with manure.....	5
Turnip drill on the ridge, with manure.....	5
Liquid manure or water drill.....	5
Manure distributor.....	10
Horse hoe on the flat.....	5
Horse hoe for setting out and thinning turnips.....	5
Reaping machine.....	20
Portable steam engine, eight horse.....	20
Second-best ditto.....	10
Fixed steam engine, ten horse.....	20
Second best ditto.....	10
Portable thrashing machine, six horse.....	10
Portable thrashing machine, eight horse.....	20
Fixed thrashing machine, eight horse (to prepare for market).....	20
Corn dressing machine.....	5
Grinding mill (to meal).....	5
Lined and corn crusher.....	5
Chaff cutter, horse or steam power.....	5
Chaff cutter, hand power.....	3
Turnip cutter.....	3
Machine to reduce roots to a pulp.....	3
Oil-ke breaker.....	5
Bone mill.....	5
Churn.....	3
Essential improvements (medals).....	21
Invention of any new implement (such sum as the Council may decide).....	
Mr. Slaney's offer of a prize for plough to fill in the soil cast out of drains.....	10

The Council adopted the suggestion of Mr. Evelyn Denison, M.P., to offer a prize to encourage the application of steam power to the cultivation of the soil; and they agreed to the following terms of such prize :

"That the Society offer a Prize of £200 for the Steam-Cultivator which shall in the most efficient manner turn the soil, and be an economical substitute for the plough or the spade. This Prize to be competed for on or after the year 1855."

The Council also agreed to the recommendation of the Implement Committee, that at the Lincoln meeting the public should be admitted, on certain terms, and under special regulations, to view the trials in the Implement Yard, commencing on and after the Thursday in the week preceding that of the show.

The Council then decided on the conditions of the Prizes for Implements, and the general regulations of that department at the Lincoln Meeting, and ordered the completion and distribution of the Prize Sheet. Special Clauses were introduced—1st, for the purpose of rendering the trial of the Steam Engines more complete and satisfactory to all parties; 2nd, for enforcing, on pain of disqualification in case of default, the regulation requiring exhibitors to execute all orders given them in the yard at the selling price stated in their certificates, and which lowest selling price has a just weight with the judges in determining the relative claims of nearly-balanced competing implements; 3rd, for requiring the consent of the Stewards to be obtained by the Judges in awarding medals for essential improvements; and 4th, for cautioning parties intending to become exhibitors, and, to prevent disappointment, giving them distinctly to understand that in future no simple entry will be sufficient, even if made in time, but that all certificates, either for Live Stock or Implements, must be properly filled up, and lodged at the Secretary's Office in Hanover-square, by the last day allowed in each case for the reception; or otherwise they cannot, under any circumstances, be received.

WOOL.—The Hon. Leslie Melville, vice-chairman of the General Lincoln Committee of the Society, having presented to the Council the suggestions of that com-

mittee, on the offer of prizes to the amount of £35, for long-wool, made to the Society by the Local Committee at Lincoln, the following arrangement for such prizes was adopted:—

Prizes of £10, £6, and £4, for Wool of Hogget-sheep; prizes of £7, £5, and £3, for Wool of Sheep of greater age: five fleeces of wool in each case to be shown, being the produce of one flock, and grown by the respective exhibitors, quality and quantity being taken into consideration.—The Council adopted the suggestion of the General Lincoln Committee, that it would be desirable, if found convenient, that a wool-sorter should be requested to select from one of the prize fleeces the several samples that would show its different qualities.

FARM-POULTRY.—Mr. Fisher Hobbs, Chairman of the Farm-Poultry Committee, presented to the Council the report of that committee on the prizes amounting to £110, and on the conditions and regulations connected with that branch of the Society's country show at Lincoln; and directed that the live-stock prize-sheet of the Society for the Lincoln Meeting should then be completed for distribution.

The Council then adjourned to twelve o'clock on Wednesday, the 22nd Feb., when Substitutes for Guano would form the subject of consideration.

NEW MEMBERS.

Lord Berners, of Keythorpe Hall, Leicestershire, and John Rogerson, Esq., of St. Alban's Villa, Highgate Rise, Middlesex, were elected Governors of the Society.

The following new Members were elected:—

Berry, Kemp, Woodgate, Beckley, Sussex
 Brewer, Jehonla, Newport, Monmouthshire
 Bridge, Thomas, Wynford-Eagle, Dorchester, Dorset
 Bright, Henry S., Hull, Yorkshire
 Burgess, Capt. H. W., Fitzroy Park, Highgate, Middlesex
 Darell, Rev. Sir Lionel, Bart., Trethorne Rectory, Glouc.
 Dupuis, Rev. Geo. John, Creeting Rectory, Needham Market
 Ellis, J., Newton St. Cyr, Exeter
 Fraser, John, Llantarnau, Newport, Monmouthshire
 Gresswell, Dan, Louth, Lincolnshire
 Hubbard, Wm. Egerton, 24, Kensington Palace Gardens
 Jones, Charles Gwillim, 23, Craven Hill, Hyde Park
 Knatchbull, Rev. H., Elmham Vicarage, Norfolk
 Mildmay, P. H. St. John, Hazegrove House, Castle Carey
 Milford, Thomas, Thorverton, Devon
 Neeson, Timothy, Frocster, Stroud, Gloucestershire
 Pitcairn, Alexander, Ardnamilly Castle, Oban, Argyleshire
 Rhind, Josiah, Wick, Cathness, Scotland
 Ridley, Nicholas James, Hollington House, Newbury, Berks
 Smith, Edward, Ratcliffe on Trent, Nottinghamshire
 Stokes, Thomas, Chivers Hall, Ongar, Essex
 Strelley, R. S., Oakethorpe, Aifeton, Derbyshire
 Thompson, George, 30, Parliament-street, London
 Titchborne, Sir James F. D., Bart., Titchborne Park, Aylesford
 Tolmarsh, Charles, Kemerton, Tewkesbury, Gloucestershire
 Ward, John, Chadlington, Eynsham, Oxford
 Wood, George, H-wigg, Carlisle
 Wortley, Edward, Rullington, Uppingham, Rutlandshire.

The names of 50 Candidates for election at the next Monthly Council were then read.

FIELD CULTURE.—Very much is said by English writers on agriculture, in favour of deep ploughing. Cuthbert W. Johnson has written on this subject the best probably of any man living or dead. It would seem as if his writings must carry conviction to the mind of every practical farmer and of every thinking man. If he and other English writers have not demonstrated the benefit of a thorough pulverization of the soil to a great depth, then nothing agricultural ever was or ever can be demonstrated.—Prof. Nash in *The Country Gentleman* (American paper).

MODERN INNOVATIONS IN FARM PRACTICE.

The past year has been more than commonly fruitful in professed agricultural improvements, which, as a practical farmer, I shall notice with the view of promoting inquiry, and of showing how far these modern introductions into farm practice can be advantageously adopted by the general body of the farmers of this kingdom; as also the desirability of adopting the modern practice of irrigation, and the new system of applying manure in liquid manurings by artificial means, as by steam power and by steam machinery.

Irrigation.—The practice of irrigation as it is generally received, has not been extensively carried out by steam appliances at present; but if liquid manurings can be so satisfactorily and expeditiously applied, it appears to me there cannot be any real objection to irrigation by sprinkling, through the aid of pipes and hose, nor any good reason why it should not meet with universal adoption.

Manuring.—The modern practice of manuring the soil by the application of manure in a liquefied form is becoming general, and is, for the most part, applied by what are known as liquid manure carts and drills. By the carts the liquid is sprinkled equally over the soil; by the drill it is streamed in rows along with the corn and seeds, and is considered a good substitute for artificial dry manures. On most soils it produces good crops, more particularly of seeds, turnips, and other green crops; and in dry seasons it promotes the rapid growth of the young plants of these crops. The most modern introduction, however, is the practice of applying liquid manure by means of steam machinery—through iron pipes laid underground, and gutta percha pipes above—and forced through those tubes as from a fire-engine. My limits prevent me giving a description of the process by which this is done; but, if we are to credit the somewhat enthusiastic accounts given by those gentlemen who have for some time pursued this system, it is a highly beneficial practice; besides, by the aid of chemical appliances, all the products of the farm are reduced into a liquefied form, capable of being forced through the pipes for distribution over soil and crops as required. These are innovations in farm practice demanding the most serious and scrutinizing attention of every farmer. There is nothing impracticable about them, on the majority of farms. Tenants on limited leases cannot be expected to be at the cost of such appliances. Landlords must provide them, and let them along with their farms. It would often accord more with the means of tenants to pay an extra rent than to expend capital in cart-horses and dung-carts.

Implements.—This department in agricultural practice and appliances has latterly received surprising encouragement. Improved machinery is all but universal: improved ploughs, harrows, cultivators, horse-hoes, subsoilers, rollers, &c., for pulverization; improved drills, dibblers, and sowing machines; improved carriages of all kinds; improved thrashing-machines, chaff-engines, turnip-cutters, bruisers, and dressing-machines; improved tools of all sorts are now general, and in common use, of which I shall not at present say anything, but confine myself to a word or two upon the most recent introductions, particularly those of the past year—reaping-machines, thrashing-machines, digging-machines, liquid manure drills, and ridge turnip hoes.

Reaping Machines.—These have attracted great attention during the past year, and have undergone very marked improvements. If Bell's reaper can be propelled by steam power, can be provided with the automaton raker, and be relieved from its *thrashing* reel, it will become a very effective implement for all reaping purposes, and a great acquisition to every extensive occupier, or it would form a desirable business during hay time and harvest for persons having such machine to let out to small farmers. Indeed, the desideratum now is to produce a compact, cheap, locomotive steam-engine capable of being turned to every useful purpose for which it may be required in farm practice—*i. e.*, to propel the reaping-machine, the thrashing-machine, the digging or fork machine, or other similar work.

Thrashing Machines.—The great advantages in the American thrashing machine are its cheapness and its capability to separate the grain from the straw without injury to the grain. This is from the effect of combing, by means of pegs or spikes, rather than by beating in the usual way by beaters. The application of shakers is now common to every steam thrashing machine, and riddling and dressing apparatus is becoming general. "Straw carriers," by which the straw is not only well shaken, but is carried to any reasonable height, either for stacking or loading on carriages—these are readily attached. Elevators for the grain, by worm, or screw, or cup, are of easy adjustment; as are also fans and screens, &c.: these are very beneficial appliances in this department of farming, and merit every attention, as being economical in the purchase and effective in working.

Digging Machines.—Machines adapted for the pulverization and perfect comminution of the soil demand especial notice. That such machines will

ultimately supersede the plough, is my decided opinion, and that with astonishing benefit to agriculture. The soil requires due preparation to receive the seed: to effect this, the operation of ploughing and harrowing is a very slow and often ineffectual process, and the cost and keep of cart-horses form no inconsiderable items in farm accounts. The application of steam to the cultivation of the soil by aid of such machines will revolutionize agricultural operations—whole fields cultivated in a day, and in suitable weather: instead of so much expensive fallowing to cleanse the soil, the farm labourers will achieve it by weeding and forking. The plough will give way to the fork and the cultivating machine: men will be more as directors of machinery than actual operators. To guide the reaper, the thrasher, and other machines will be their chief employment: the exercise of mind will be exchanged for the labours of the body: farm labourers will almost cease to be as “beasts of burthen,” and become intellectual members of society, and “giant steam” be their emancipator and substitute. This will also lead to the abolition of every absurd restriction upon cultivation and cropping, because these operations cannot be carried on except upon soils which are kept clean and free from weeds. This will be indispensable as respects creeping-rooted weeds; and such being the case, all cause for restriction with a view to prevent deterioration in the soil being thus removed, the farmer may be safely left to pursue whatever course his skill

and judgment may dictate to him. Samuclson's digging machine is the best I have yet seen, but far below my expectations. Usher's steam plough and Romaine's cultivator are well worthy of encouragement. The latter is said to be capable of thoroughly comminuting ten acres, at a very small cost, per day, and is also convertible for many other uses.

Liquid Manure Drills.—These are becoming very general, and are very serviceable in producing good root crops. The deposit of a requisite quantity of fertilizing liquid with every seed on a dry soil cannot fail to be a benefit; but in summer, and on suitable soils, this liquid drilled in with the seed designed for a green crop promotes a very rapid vegetation and healthy growth, which, when once obtained, the crop may be considered safe.

Ridge Turnip Hoe.—This is a peculiar implement, designed to set out at intervals the turnip or other similar crop. It does its work satisfactorily, but I cannot express my approval of the system, believing such to be a manual operation; or, if it is done by machinery, each stroke of the hoe should be capable of regulation by the attendant, otherwise inconvenient spaces will occur.

Many other subjects I should be happy to take up relative to agricultural progress, not altogether foreign to my province as “a practical farmer.” The above, however, must for the present suffice, as being some of the most prominent of the innovations in farm practice during the past year.

FENCES. — HEDGE PLANTING.

If we were asked what object on a farm first caught the eye, and was the most prominent and decisive index of good or of bad cultivation in the minds of the majority of men, we should certainly answer that the condition of the fences would be the first criterion.

For this there may be several reasons. The two most prominent are, that they are seen with greater facility, and present themselves at a glance of the most casual observer with far more facility than the minutiae of general cultivation; and as a large area of fences is often presented to an individual taking a bird's-eye view of a farm, so every little gap, irregularity, unevenness, or departure from uniformity, can be observed by the most inexperienced tailor or shoemaker who casts his eye upon them.

But a reason far more potent, why a view of the state of the fences is generally taken as an index of a good or a bad farmer, is that they require by far more care, attention, and skill than perhaps any other part of a farm; and hence, if anything is neglected, these—which do not pay directly, as corn,

or turnips, or potatoes—are sure to be the first to suffer.

When we reflect that a fine, smooth, low, quick-set fence is a violation of the order of natural growth, we have no difficulty in conceiving how they are so often mismanaged and neglected. The thorn, most usually the plant selected for a live fence, may be called a tree—we mean, that its natural tendency is to form a trunk with branches; and a not unpicturesque object is a thorn tree in a park or a pleasure-ground. Now the tendency to form a bush seems to be the first development of the thorn only. It is a shrub merely when young; but as it is impossible to have universal vigour, the whole efforts of the farmer have to be directed to keeping the youthful vigour of the thorn, and thus prevent its leaving the bushy state and forming the tree. He is defeating, and not promoting, therefore, a natural operation; and the neater thorn fences appear, the more they are departures from the natural state of the thorn.

Naturally, thorns planted in a line would tend to

grow straight upwards, thin at the bottom and bushy at the top; which is the reverse of a fence. The most obvious mode of remedying this, and indeed the course which has been adopted with almost all old fences, is just to cut off the thorn to the requisite height and leave it. But this cutting off has another effect upon the fence: it thickens all the stems; the tendency to form wood is transferred from the young shoots to the old "chump;" and soon the fence consists of old chumps thinly studded with new shoots, like the scattered hairs on the aged head. The growth of grass below, together with the tendency upwards, soon denudes the bottom of the fence of every kind of shoot, and then the dead thorns are stopped in, to supply the place of living shoots. This completes the work of destruction of the fence. The undergrowth becomes less and less, the chumps begin to grow hollow and die, and the "gaps" wider and wider, until the fence becomes half-living and half-dead. In many cases it is also crooked; and when all these are present, it is the most desirable, usually, to grub up the old fence, and plant it entirely anew. The renewing will cost 9d. per yard; but it is often more economical than battling with an old mismanaged fence. But all cannot do so. It is seldom a tenant's work, and it is more usual for the farmer to do the best he can to mend the old, rather than rear the new.

There are two modes of accomplishing this. The plan in either case must clearly be to remove the whole of the old wood, either sooner or later, to make room for the new; and this can be accomplished either by cutting off, by the surface of the ground, the whole of the old wood, and so leaving the roots to send up nothing but new and bushy wood, or laying the thorns from the bottom.

But it must be obvious that the former entirely destroys the fence for two or three years, and if any stock is to be kept in the fields it surrounds, an expensive guard fence must be inevitably put up, or the whole will be destroyed. The cleaning of the old roots, &c. has to be attended to in exactly the same way as young quick-wood; for if there is not the fullest scope for air and moisture, the cutting off of the old wood will only tend to destroy the roots. This is one mode of reviving an old quick-set fence.

Another, more common, and certainly less troublesome and expensive way, is to begin and lay the whole of the old wood by the bottom. Every "chump" is cut near the ground, so as to leave the bark, and as much of the wood as will bend without breaking, which is laid at an angle of some 45 degrees. The sap ascends just sufficiently to keep life and a little action in the old stem; but by far the most is employed in striking out new shoots

from the root. The old wood is a fence to keep the stock, and a protection to the young shoots till they are strong enough to lay themselves; or to cut, or splash, or undergo any other process the farmer may choose; and then the old chumps are cut out, and the whole fence is one of entirely new wood, and young and vigorous shoots.

In cases where they will not meet, the old soil should be taken entirely out, a deep trench made of new soil, and well watered and slightly manured, and new quicksets put in, and attended to, in the same manner as if it were entirely new. If planted in the old soil, it will be almost impossible to get them to grow; and a little manure, with entirely new soil, will save an immensity of labour in after-years.

Perhaps the only "radical reform" of old soft and bad hedges is to extirpate them root and branch. This at least is a permanent cure of the diseased hedge; and if the new one is to be made, it must run in an improved, certainly in a new, patch of ground. But Mr. Mechi, in his late paper before the Society of Arts, carries his notions of agricultural "progress" to the "knife and the sponge"—the destruction of every vestige of the old constitution of fence, and the foundation of a new state of things. "Adieu," says he, "to small fields and narrow lanes." If fences are to be tolerated at all (and when we saw Tiptree they were all removed except boundary fences, if we rightly remember; but we thought the crops under the shelter of his boundary fences—aye, and banks too, somewhat better than the more exposed parts of his fields)—if they are to be allowed to exist, they must be made more geometrical. "Many a sturdy old pollard has," he exclaims, "bowed to his influence, and many a crooked hedge and way, has been made straight by his example;" and therefore we infer he has planted division fences in his large open fields.

Where all the produce is brought to the farmstead—the fashionable process on some farms—fences are clearly unnecessary; but where sheep are depastured instead of being stall-fed or shed-fed, where bullocks are grazed and horses turned out, fences of a more permanent and sheltering kind than nets and hurdles are necessary, to enable the farmer to preserve the boundaries between cattle and corn. And though a digression, we may venture here to notice the balance-sheet of a farm where fences are either removed or remodelled, and this balance-sheet is all the more valuable from its being the second published; it shows a far more encouraging view of things than the last. The prices are better, and we have a profit of £313 odd, after paying rent and all outgoings. We forget the statement of outlay capitalized—we have

not an opportunity to lay our hands on the paper containing it, but, if we rightly remember, it was about £6,000. We do not quite recollect either whether he gave any balance-sheet for the last year, 1852; but, if we are correct, his balance-sheet given before the Society of Arts, for 1851, showed a loss of some £650 in that year. This he disposed of at the time, by taking credit for manure in the soil. Did he bring up this in his last year's balance-sheet? or is he willing to drop it, or credit it to capital expended?

One word will be expected from us as to his mode of constructing that account. It is all estimate—at least, as regards corn. His stock account shows sales as well as valuation; why not also show sales of his corn? We take it that he always sells off all his barley and beans; for no credit appears to be taken for any of his *crop* ever given; all the corn spoken of as given to his stock is described as bought. Possibly the *quality* of what he grows is so good that he sells this off, and buys corn in return of an inferior description.

Could he not simplify the whole by inserting, as he has done with stock, *sales* of corn, instead of double estimates—first of quantity per acre, and secondly of price?

We observe the whole of his corn is valued at £899, so nearly £900 that it may be taken at that sum in round numbers. Now it is quite clear that the prices are just about double what they were when his celebrated balance-sheet for 1851 was read before the Society of Arts. If the prices *then* had continued, this quantity of corn would have brought him in about £450 less than it does at the present time; so that more than all the £343 would have been swallowed up, and the balance still remained on the wrong side of the book. Prices, we fear, have had to do with his apparent profit this year, quite as much as irrigation—beneficial as that process must be admitted to be.

But if the profit were £343, we fear it holds out little inducement to follow the “radical reform” this gentleman leads to the agriculturists. He stated somewhere, in 1846, that he had expended in his land by purchase and improvements £13,000.

This was at any rate printed in 1851, and not contradicted by him. He estimates the cost of irrigation at £6 per acre. Take his farm at 130 acres, this adds £780 to his previous £13,000, which, with £650 loss in 1851, will make a gross capital to pay interest, of something like £14,500. The amount of surplus available, as we find it in his balance-sheet to meet the interest of this, is £583. If this is correct—if it approximates to the truth, we must have more success in irrigation and in prices to make ends meet, to say nothing of the depreciation of markets, &c., and the thousand-

and-one *et-ceteras* which investors of money find they have to account for.

We do not wish to unjustly disparage our friend Mr. Mechi. He may in his way have done good. Men following at a distance have more probably taken the benefit of his advanced measures of agricultural reform. His openness, his hospitality, his kind-heartedness, are sure to win him some good-will from those who will not follow all his plans, or cannot relish all his theories.

There are few subjects on which more practical ignorance is displayed than in the renewal—the planting of fences. We hardly know a good treatise on the subject. We see but few successful instances of the remodelling of a farm by getting up successfully really good thorn-hedges. The vigour of our improver often commences with a spasm of destructiveness to the old soft crooked broad fences on a farm—goes on] with equal decision till they are completely levelled; but look at the same fence five or six years afterwards. You see large spaces of “scraggy” quick thorn, crooked, and ill-grown, showing symptoms of stuntedness and neglect which are beyond all mistake. The thorn has been placed in a poor subsoil; just as if barrenness was the rule, and not the exceptional circumstance of successful planting. Sometimes the bottom weeds are not kept down; the hands are otherwise occupied, in the zeal to grow turnips and corn and potatoes and mangold; or perhaps a sufficient guard fence is not put up, and the quickwood is cropped, and bruised, and left to perish. The new hedge soon assumes as bad an aspect as the old one; the guard fence fails before the new one succeeds; and the new quicksets are a far worse and more hopeless fence than the dislodged old one before it was stubbed up.

Three great errors prevail in hedge planting; one of which too often renders all other efforts useless and nugatory: this is, almost an universal desire to plant on a bank. If the spot selected for planting were the summit of one of the highest hills capable of sustaining the vitality of the quickset, the planter would erect a mound upon that before he planted his thorn!

The simple effect of this is, that it is a miracle, almost, if the plant can ever grow. The mound effectually shuts off all the water of genial showers that would succour and sustain the feeble powers of the tender young plant; and this exposure of a shrub, which manifests in all its vital bearings a marked predilection for shelter, is one of the greatest possible impediments to its growth. But even this is not all. The exposed mound, resistive of moisture in winter, is attractive to summer drought; and how the feeble tendrils of the quickset resist these united influences as even they do, is absolutely a

wonder. If not planted in a slight ditch, they should always be grown on a level a little sloped from the outside, so as to have the tendency to throw the water falling near the plants, to the roots of the quickwood.

Another most injudicious method of planting thorn fences, is to put them in, utterly disregarding the condition of the soil. The quickwood is a plant which can be encouraged by manure, and can be made to grow vigorously or otherwise, just in proportion to the condition of the soil or subsoil in which it is more frequently planted. We are certain he consults economy who manures it. From a variety of causes, it is by far the most easily kept clear in the early stages of its growth. Let it once get into neglect, into stunted growth, and the root-weeds will so intermingle with the filaments of the thorn as to render clearing almost impossible. A vigorous growth at the first will of itself half keep down the weeds, without the appliances of any extraordinary or protracted cleaning.

In planting a new fence, the line of a growing one should be always avoided; the young plant cannot grow in the thorn-sick ground of the old. If it is to be nearly in the same line, a parallel one must be selected, if possible; or what is better, a summer fallow of the land, or a few green crops, well manured, would prove by far the best preparation.

A trench dug for the quickwood should be taken out, first, some four inches deeper than the roots of the plant are intended to be placed. This must be filled up, say to the point of the roots, with fine fresh soil. If this is not at hand, the subsoil should be taken out, and the surface soil put in the trench instead; the whole being in fact reversed, and the subsoil all replaced for three inches under the plants with the surface-soil, and to this a little manure or compost should be added. It will be money as well spent as in manuring a turnip crop.

In some cases of recent enclosures, or taking up fresh moorland, this is very difficult. We know a very striking instance where a set of fences had to be planted on a farm of real grey sand, almost as loose and poor as scouring sand. The quicksets were planted in with a dressing of marl; and they grew in the most vigorous and luxuriant manner. They had the same manure, in fact, as the wheat, the barley, or the turnips; and they paid for it. The grey sand on the surface was too poor to grow even weeds. The quickwood therefore required very little cleaning.

The third reason of the failure of newly-planted fences is their after-neglect. Many parties think, when once they are planted they are done with for ever. Those who think so will be disappointed in their notions. They should at first be well protected from all kinds of animals; and these fences

must not only be made—they must be kept up most scrupulously; for if not, a single rail off, or a single post down, may let in stock and so ruin the whole.

Cleaning is another desideratum often neglected. The weeds are allowed to rob the soil, and to exclude the air from the shoots and leaves; and many a fence is choked with accumulations of weeds, till it is utterly destroyed. Hoeing and hand-cleaning in June and July, and even digging in the latter month, will be found more readily to repay the cost than almost any other operation; and if the fence grows ill, a little manure dug-in will have the most powerful effect on the plants imaginable.

We so seldom see estimates of the cost of planting and rearing a thorn fence, that we will give our experience of the cost of this process, and are certain our improving readers, who have not had much practice in planting fences, will thank us; while those who have gone through the process, and kept proper accounts, will be able to check the several items in the account.

It must, however, be presumed that these will differ a little in different localities. We take what may be considered a fair average of the island.

Cost of planting thirty roods (of seven yards) of quickthorn fence:—

FIRST YEAR.			
October.	£	s. d.	£ s. d.
Deep-digging the ground at 1d. per rood	0	2	6
2,000 quickwood at 15s. per 1,000	1	10	0
Making ditch, pruning and dressing plants, and planting same, at 1s. per rood	1	10	0
One single load of manure per 42 roods, at 3s. 6d.=1d. per rood, or	0	2	6
			<hr/> 3 5 0
Guard fence—			
215 larch posts, at 1d.	0	17	11
600 yards of railing-wood and labour	1	15	0
900 nails	0	8	6
Fixing posts and rails, at 2d.	0	5	0
			<hr/> 3 6 5
SECOND YEAR.			
Three cleanings in May, July, and October, at $\frac{3}{4}$ d. each per rood	0	5	7 $\frac{1}{2}$
THIRD YEAR.			
Two cleanings and one digging	0	5	10
Cutting	0	0	6
FOURTH YEAR.			
Cutting	0	1	0
Ditch cleaning, at 1d. per rood	0	2	6
Three cuttings, in three consecutive years, average 1s. 6d.	0	4	6
			<hr/> £7 11 4 $\frac{1}{2}$

So that the cost of properly raising a new fence will be about 5s. 1d. per rood, or something under 9d. per yard, when finished.

HEDGES AND HEDGE-ROW TIMBER.

The deep shaggy oakwoods, the green fields, the hedges, and hedge-row timber, are things which belong to Great Britain alone. Every English child is taught to read and speak of the English oak, the hawthorn hedge, and the village green. These are the specific characters which broadly mark and distinguish this from all the other countries in Europe. Go where you will, there is nothing comparable to the vivid green of English pastures, bounded and intersected by the deep shadows of the oak, the elm, the hawthorn, and other native trees, scattered in wild disorder over the smooth hills and fertile valleys in broad and massive woods here, groves and detached groups there, and single trees and hedge-row timber meeting the eye everywhere around. This is, we repeat, the peculiar and distinctive mark applicable alone to English scenery, and seen nowhere else in Europe. Traverse the rich and highly-cultivated plains of the Netherlands and Belgium, and the ceaseless toil of the frugal cultivator has uprooted everything that resembles either tree or hedge, and nothing meets the eye in winter but the dark-brown earth under perpetual cultivation, broken only by the endless rows of poplars and the often-recurring groups and straggling rows of apple and pear trees. Travel still northward, and Holland, with its bulb gardens, treeless and boundless, a dreary flat, presenting nothing so remarkable as its straight horizon, smooth and as unvaried as the ocean itself. Go into northern Germany, and while the winters are cold to intensity, and the summers alike severely hot, there few green pastures are to be seen, and the black pine forests and sandy plains recur again and again as the principal substitute for the English oak forests. Pass southward through Prussia, Saxony, or Austria, and spruce and the Austrian fir still form the leading trees, if we except here and there isolated spots, and occasional rows of fruit trees by the sides of the highways, as in Saxony. Much of Silesia, and the western provinces of Poland, is as guiltless of trees as anything which Dr. Johnson met with, in his travels through the length and breadth of Scotland, and "saw but one tree." A sight of Silesia, to be sure, would do a Northumberland or Scotch farmer's heart good—to say nothing of others—to see the flat and fertile corn-fields without a hedgerow or tree stretching over 500 acres in one breadth, with neither tree nor scrub big enough to shelter a Jenny-wren.

Leaving these northern portions of the globe, and

travelling southwards, through France for example, to the blue waters of the Mediterranean, and vineyards, scrub, mulberry, walnut, and orchard trees are the kinds which chiefly prevail. Exceptions there are, but these exceptions are very rare; while the woods and green fields constitute the rule in England. Pass over the Appennines, and descend into the valleys and amongst the hills of Italy, and vineyards in the valleys, olive trees on the hill sides, Scotch and Austrian pine, and the tall cypress higher up the mountain sides, constitute the prevailing timber. In the south of France, and in Italy, where fuel is scarce, not more than one common forest tree in a thousand escapes being pruned and lopped into the shape of a household mop. In this dry and arid climate, too, where moisture in summer is the great desideratum to the husbandman, the hills and mountains are as sterile and naked as the wildest mountain-top in the north of Scotland.

In cases where there are trees, they are so constantly and severely pruned as to be wholly incapable of affording any kind of shade or attraction to the deposit or detention of moisture. Clothe the hills and mountains in the south of Europe with dense forests, similar to those which so universally prevail in England, and the climate would become moist, and the scorching and unbearable heat of summer greatly modified. Transpose, if you will, the woods and hedge-rows and hedge-row timber of England to the hills and mountains of Italy and the south of France, and much of the excessive moisture of our own little island would be dried up and dispersed.

Such, then, are some of the leading features and characteristics of the countries in question with respect to their sylvan aspect. Other countries besides Great Britain have their trees, woods, and forests, great and good as any of which Great Britain can boast. But England has her "parks;" and these are clothed with green, as well as abounding with stately timber; and this green-sward, so cheering and grateful, is seen nowhere else as it is seen in the parks, the pastures, and hill-sides in England. In most of the countries to which reference has been made, the heat of summer is too great to permit the culture of permanent pasture, as we understand it at home; while in others the very severely economical system of husbandry forbids the occupation of land with either trees or hedges. In this cursory glance at the condition of

the forests, woods, and trees of other countries, as compared with the state of things which we see around us at home, it will be observed that there are wide and striking differences; and it would be both interesting and instructive to dwell at greater length than the limits of the present notice will permit, on the causes of these differences, as well as on some of the effects which they produce on the climate, the value of timber, and on agriculture. In England several circumstances contribute to foster a taste for the love of trees; such, for example, as the wealth of the English landowner, his pride of class, and desire for territorial display, with other minor causes, all operating in the same direction—as the love of sport, and the consequent encouragement and extension of plantations for the increase and protection of game, and animals of the chase. It is no matter that all such plantations are designed at first with no other end in view than that to which we have just referred (but more of this hereafter), and consisting of the most worthless kinds of trees, and the very reverse of profitable, they are not the less certain for all that to be retained. The love and appreciation, indeed, of English scenery is more or less felt by every intelligent being permitted to daily witness the combined effect of the incomparable beauty of English woods and English green-sward. It is to this universally conservative principle, and love of trees, which in many become a passion so strong, that the amputation of the smallest branch of the most worthless tree—to say nothing of the removal of the tree itself (howsoever desirable)—is resisted to the last, and never submitted to but with the utmost regret.

To these and other like causes may be attributed

very much indeed of the vast extent of woodland scenery by which England is distinguished from nearly all the old countries in Europe. In most of the kingdoms and states on the continent there are at present, and have long been, causes in operation which have led to the destruction and permanent suppression of all hedges and hedgerow timber. In most of the countries to which reference has been made, owing to the extreme subdivision of land into possessions so minute, landed property has become of so much value to the individual owners, that it is easy to understand why both hedges and hedgerow timber should be an unpopular article of produce among a people where so many families occupy only land enough to produce food for their own sustenance. Exceptions there are, of course, to this as a rule; but they are the exceptions. As in this country, there is government property, and, of course, royal, ducal, and princely forests; but, not as in this country, small owners scarcely ever permit a tree to be grown on their limited holdings; and it is common to pass, in many parts of the continent, villas and villages with scarcely a tree in sight.

From these remarks it will be seen that, in such countries, the growth of native timber cannot meet with much encouragement, and the absence of trees and hedges can be thus very readily accounted for; while their abounding presence in our own land, looking at the causes in operation, is equally likely to produce all that we see of wood, of hill and dale, of greensward and running streams, incomparably surpassing in landscape beauty aught but the rare exceptions of anything of the kind to be met with in the countries of which we have been speaking.

MR. DENTON'S PROPOSED PLAN OF TRUNK OR ARTERIAL DRAINAGE.

In articles on drainage, which have appeared from time to time in these columns, we have adverted to the difficulty which exists in bringing a numerous proprietary to agree for the execution of combined operations which may be necessary for the deepening of outfalls, in order to render lands capable of being under-drained which are not at present sufficiently elevated above the water level, or to enable uplands to be freed from their surplus waters without inundating the level tracts below them.

We are happy to see that this subject has been taken up by one who must have had much experience of the evils attendant on our present system—or, rather, want of system—and who, from his practical knowledge of the obstacles in question, should be well qualified to suggest a

remedy. Mr. Bailey Denton, Draining Engineer to the General Land Drainage Company, has just published a letter to Mr. Pusey on this subject, that appeared in our last impression, and in which he complains of the disorganization arising from the English-like proceeding of beginning immense operations at the wrong end, as exemplified by our disregard of the fundamental rule of starting all drainage works from the lowest point. “By the various unconnected works,” he says, “of under-draining which have been already carried out, vent has been given to pent-up waters previously dispersed by dribbles and evaporation; silicious and calcareous soils have been converted from saturated masses into vast filters of rapid action; tenacious clays have been compelled to

let go their hold of waters hitherto claimed solely by the atmosphere. But it would appear that the only object aimed at has been to get rid of the injurious waters by the cheapest possible course, without any consideration of the fact that water set free above, commits injury below, unless it be securely guided to its ultimate discharge."

Having borne this testimony to the want of system in our present drainage operations, Mr. Denton adverts to its injurious results in the disputes and litigations, and efforts at retaliation, which are becoming daily more frequent, as the present unconnected works proceed. "This, however, he says, is not the worst. Legal strife might possibly beget a legal remedy; but, in order to avoid such annoyances, shallow and inefficient drainage very often has been carried out, on lands approaching the outfalls, under the specious plea of incapability of improving them without the co-operation of others, who either negative such a proposal, or remain passive, in order that the first promoter may bear the whole expense of the work; and, with shame be it said, it very frequently happens that the more enterprising landowner, rather than suffer an imperfect finish to disgrace an extensive improvement, has taken upon himself his neighbour's work as well as his own."

Proceeding to the remedy for this state of things, Mr. Denton proposes, not to have recourse to a general measure which shall deal with all the rivers and streams in the United Kingdom, but to carry on the remedial operations in the same reversed order in which we have begun. He would commence the work of trunk or arterial drainage, by improving the minor tributary streams—those water-courses upon which no mills exist, and with which no peculiar water interests are connected, but which are nevertheless the arterial receivers or waterways of the drainage and surface waters of the higher lands. A more general and comprehensive measure he considers hopeless, at present, not only because of the magnitude of the undertaking, but because of the delay which would arise from the protracted inquiry necessary, before the Legislature would pass a general Act for the improvement of mill streams and main rivers, with all their attendant difficulties, real and imaginary. He admits that the day is approaching when country millers will believe it possible that steam power may be more economical than water, and he believes also that the time is propitious for the inquiry which must precede general legislation. He would impress, however, upon all influential agriculturists the necessity of maintaining a distinction between the improvement of the main lines of drainage and the improvement of their minor tributaries. It is not merely the opposition of millers and water

owners which is to be encountered in the former work: there are engineering difficulties in dealing with the larger rivers, and the heavy cost of effective works, including compensation to injured interests; and this will lead to delay very injurious to the drainage of the *upper lands*. To this we may add that the lower you descend a stream, the more the interests antagonistic to improvement increase, and the more complicated the case becomes with the claims of inland navigation and of harbours. Important harbours may easily be injured by the works necessary for the improvement of alluvial tracts deserted by the sea, or for the reclaiming of those over which it holds at present a precarious and divided sway.

Mr. Denton does not object to inquiry, as a prelude to some general measure for improving outfalls and main lines of river drainage; but while this is pending, he would not allow works to be delayed for the improvement of what may be called the head-water drainage. He argues, very justly, that by far the larger proportion of our corn lands are the higher lands, so situated that the minor arteries and outfall ditches, receiving the surface and drainage waters, are to the mill-streams what the ordinary highways and byeways are to the turnpike-roads. He proposes, therefore, that some general measure should place these important but inferior waterways under central jurisdiction, represented by district officers, whose duty it should be to examine the state and efficiency of any watercourse (not affecting mills and water-rights) at the bidding of any landowner prejudiced by the neglect of another. This district-officer is to report to some central authority, who after due notices shall have been given, and objections heard, shall direct the execution of such works of cleansing, scouring, widening, and deepening, as they may think proper, with funds raised by their order on the landowners, in shares proportionate to the benefit derived. In the Inclosure Commissioners, Mr. Denton sees a competent existing board of appeal and jurisdiction, and he will meet with no one to gainsay his assertion that they would easily find plenty of active and competent engineers for the district-officers. In reply to an objection which may be advanced that such a jurisdiction is rendered unnecessary by the Act of 10 & 11 Vic., cap. 33, sec. 14, *et seq.*, he urges that the necessity of giving formal and legal notices—the uncertainty and delay of obtaining a warrant from two Justices of the Peace in Petty Sessions—the personal annoyance of appearing against a neighbour who is perhaps a magistrate himself—the disagreeable process of levying a distress for costs and expenses, and sundry other invidious discomforts and troubles attending the Act, render it practically nugatory. For these reasons

he proposes the central tribunal above indicated having district-officers under it, who should act both as public prosecutors and engineers. Without wishing to see the continental system of government centralization introduced into this country, we are daily more and more convinced of the necessity of some properly constituted authority, which shall have power to prevent a man from converting his ownership of a part of the earth's surface into a nuisance to himself as well as to the community in general. Property has its duties as well as its rights; and if it will not perform its duties, it must be made to perform them. It is all very well to talk about our Saxon institutions. They were, we have no doubt, admirably adapted to Saxon times; but we live in a more advanced and artificial state of society, which demands for social and economic purposes all the aids which science can command, but which the majority of men do not appreciate because they do not understand them. When

knowledge shall be more generally diffused, our folknotes and wittengamotes may be competent to deal with such questions; but while—we will not say the mass of the people, for our labouring population bids fair to be soon the best informed—but while the bulk of the middle and upper classes remain in a state of ignorance, as to the science of common things, which would have disgraced the age of the Heptarchy, it is idle to allow ignorance, obstinacy, selfishness, prejudice, and caprice to prevent improvement, under the specious and popular names of self-government and Saxon institutions.

Objections may be raised to Mr. Denton's scheme; but it must be remembered that it is a mere outline, and that these objections may vanish when the details shall be filled in. We may state on some future occasion those which have occurred to ourselves, in order to give Mr. Denton an opportunity of explaining them.

A M A T E U R F A R M I N G .

It will be remembered that the amateur farming of Mr. Briggs—we ought to say Mr. John Briggs, for he is younger than the celebrated Briggs—is carried on with a double object, as an example to the tenantry of the estates to which he is agent, and as an amusement to himself when he visits the country. Our correspondent having described its influence on the tenantry, proceeded to show how it acted as an amusement, and how it affected his friend's domestic comforts. If it should be thought, he observes, that I am committing a breach of confidence, and violating the rites of hospitality by these revelations, I must beg you to bear in mind that they are made at the express desire of Mrs. Briggs, who requested me to have her husband's farming shown up in the *Mark Lane Express*. "It is a perfect nuisance," she added, "to himself, and everybody else. He finds fault if I do not dress well. In his position it would injure him, he says, professionally, if I am not dressed like other people; and I am sure nobody can be more economical than I am. I have only had five new dresses this summer; and as to bonnets, I am quite ashamed of mine: it is as old as the hills, for I have had it ever since September. And yet, would you believe it, when I asked him this morning for a cheque to pay the dressmaker, and Jemima's drawing, music, Italian, and dancing masters, he said I must put it off till next week, his account was rather short just now. I know, however, that he is going to pay Moonshine fifty pounds on the farming account." And who, I asked, is Moonshine?

"Oh," replied the lady, "he keeps our village hotel. He holds a little land, and is my husband's farming factotum; he buys for him and sells for him, and buys of him and sells to him, and works our land with his horses, which we fancy more economical than keeping teams of our own. My husband and he settle their accounts quarterly; and I do not know how it is, but there is always a large balance in Moonshine's favour. This is one of their settling days." This conversation took place on the Monday morning as Mrs. Briggs was preparing the breakfast. We were to breakfast at half-past seven, as we were to start for London by the 8-20 train, and from 7-30 Briggs had been beset by a throng of the minor tenantry of the estate. They were chiefly of the female sex, all very fluent of discourse, and very much given to repetition of the same fact or the same idea. One wished to rent the new cottage near the Grange, and Briggs referred her to my lord. He could not let it without my lord's sanction, as he believed it was built expressly for an old servant of the family. Upon this the good lady declared that she did not think it right to ask Lord Fairburn till she had spoken to Mr. Briggs. And if she made this statement once, she repeated it a dozen times. This axiom appeared to have been originally laid down by Briggs, for the old lady seemed to consider it a poser; and he approved of it as a general principle, only he deviated from it in exceptional cases, of which this was one. One old man who rented a few acres of land wanted a new manger and a gap

mended in the pales round the orchard. There was a quarter-of-an-hour's haggling whether he would do the labour if Briggs furnished materials. We were another quarter-of-an-hour arriving at the money value of these repairs, and at length, it having been ascertained that ten shillings would pay for both, they were granted. Then came an old woman who wanted two slates on her house and a sink in the scullery. She was followed by half a dozen others who had received notices from the Inspector of Nuisances to pull down pigsties or erect other buildings, which in sanitary reports are called "closets," and at railway stations "departments," but which Inspectors of Nuisances describe by a less refined name. At length, all their cases having been disposed of, Briggs came to his breakfast, exclaiming, "Come, Goosequill, we have only eight minutes." Mrs. Briggs, kind soul! had poured out his coffee to cool. We had a dish of delicious sausages piping hot before us; and Briggs had just raised the first mouthful of one to his lips, when the servant entered with the announcement that Mr. Moonshine wished to see him. "Confound the fellow!" said Briggs—"send him in. Well, Moonshine, what is it? What do you make the balance of your account?" "Sixty pounds fifteen and ten-pence, sir." "And that without the wheat-sowing?" "Yes, sir." "Well, there is fifty pounds for you; I must look that account over, but I have not time now. Have you thrashed the wheat-stack?" A reply in the affirmative produced an inquiry as to its produce, and an expression of surprise that the yield was so small. The same question respecting the pea stack and the bean stack produced a long verbal statement of the number of bushels of each sold and paid for, sold and not yet paid for, or given to the pigs or bullocks, which seemed to have been great consumers. To the question whether he had sold the wheat, Moonshine replied that he had asked 82s. for it, as Briggs had desired, and had been bid 74s.; if he could have got an offer at 76s. he would have taken it. "I won't take less than 80s." said Briggs. "And what am I to do with the bullocks?" said Moonshine; "they have broken the hurdles and got into the plantation, and Martin" (the gardener) "said you would not like to see it." "Sell them," said Briggs—"£50 is the price; you may have them yourself for £50." "I am much obliged, sir, but I can't see the money in them; I will give you £75, or I can take them into the fair, if you like."

"They shall not go into the fair," said Briggs, "to be blown on like the last." They then bargained for the sale of a few acres of turnips for Moonshine's sheep; and he returned to the subject of the wheat and the bullocks, encountering with great diplomatic skill the resolution of Briggs not to sell either below the prices stated, with questions as to what was to be done about sacks, as the wheat was in borrowed sacks, their own not having come back from the mill to which the last lot was sold, and what was he to do to keep the bullocks out of the plantation? On the question of the beasts Briggs was inflexible; on that of the wheat he was posed about the sacks, and gave way, authorising Moonshine to do the best he could with it, and dismissing him with—"There—there's a cheque for fifty pounds; be off with you, I have no more time to talk to you now." [*Exit Moonshine.*] "He calls this pleasure," said Mrs. Briggs. "When I want him to give up the farm, he asks if I would wish to deprive him of almost the only amusement he has." "There is no disputing about tastes," said I. Briggs swallowed a few hasty mouthfuls of breakfast; we jumped into his gig, and, by dint of hard driving, just saved the train. I had the satisfaction, however, before we started, of proposing an arrangement which Mrs. Briggs appeared to approve of. I suggested that it would save much trouble, and greatly simplify the farming accounts, if the Dr. and Cr. sides of them were divided—Mrs. Briggs keeping the latter, and her husband keeping the former. I proposed that whenever Moonshine sells any produce he should hand over the proceeds to Mrs. Briggs; and that Briggs should supply him with cheques for all outgoings. The proposal appeared to be as satisfactory to the husband as to the wife; for he thanked me for the hint, as we drove to the train, adding, with a knowing wink—"Now I shall be able to farm in peace."

I have since learned that Moonshine has been dismissed for having bought too palpably good a bargain of his master in some of their dealings. Briggs is looking out for a new bailiff, and I do not suppose he will have much difficulty in finding one properly qualified; for I see numerous advertisements of bailiffs and land-agents wanting employment, who appear, by their own descriptions of themselves, to be capable of anything; and, on the other hand, I see very few advertisements from noblemen and gentlemen requiring their services.

W A G E S .

No. XXIV.

"Accept my thanks for the very interesting pamphlets you have sent me. I am interested in every such statement in England, not only for England's sake, but for America's. The situation of the operatives in England has often been used—most illegally, it is true—as an apology for a far worse system of things in this country. Every attempt, therefore, to improve the working classes of England acts directly on the question of American slavery. I therefore wish all success, &c. —Very truly yours, H. B. SROWE."

If I again quote the words of Archbishop Sumner, my readers must pardon me: they help us so much in viewing our subject aright, that I cannot allow them to be lost sight of—

"Of all obstacles to improvement, ignorance is the most formidable, because the only true secret of assisting the poor is by making them agents in bettering their own condition, and to supply them not with a temporary stimulus, but with a permanent energy. As fast as the standard of intelligence is raised, the poor become more and more able to co-operate in any plan proposed for their advantage, and more likely to listen to any reasonable suggestion, and more able to understand, and therefore more willing to pursue it. Hence it follows that when gross ignorance is once removed, and right principles are introduced, a great advantage has been already gained against squalid poverty. Many avenues to an improved condition are opened to one whose faculties are enlarged and exercised: he sees his own interest more clearly, he pursues it more steadily, and he does not study immediate gratification at the expense of bitter and late repentance, or mortgage the labour of his future life without an adequate return. Indigence will therefore be rarely found in company with good education."

It is very evident that the Archbishop thinks that education for the poor is essential to their physical and mental health. He thinks, moreover, that amongst the benefits arising from it, that of making the poor the instruments, for their own exaltation is not the least.

It is true that we who owe to the labouring poor the means of wealth, leisure, and knowledge, ought to pay back to them not only the wages of labour, but that priceless possession, of which labour tends to deprive them.

I have made this concession to the present manner of estimating wages. We have no right, however, to be so inconsiderate in the payment of a debt, or the conferring of an obligation, as to do an injury to the person affected. It seems that the most effectual manner of discharging our duty to the poor is by assisting them to better themselves, and by making them direct agents in their own improvement. We do this not by gifts; but by such attention and kind consideration to their wants, by a just remuneration

of their labour, by a true appreciation of their honourable position in society, we are to give such a stimulus to the cultivation of the principle of *self-reliance*, as to invest them with a permanent energy.

When a man receives as a gift what he feels was due to him as a right, his spirit rises against the indignity.

The minutes of Council on Education abound with instances in which the poor show their appreciation of good education, and their uniform desire to pay for it rather than to receive it gratis. Why should we all preach, and talk, and declaim against pauperism, and then show by the plans we adopt that in respect to education it must be assumed as a principle that the whole of the labouring class are paupers.

Would it not in some cases be well to think of an education in common? Suppose that the farmers, instead of sending their children, at great expense, to town schools, where they seldom learn much, and usually increase the half-yearly bill with a long list of extras, took this matter of village education really to heart—they might establish such schools, and appoint such masters and mistresses, as would be fully suitable for the instruction of their own children, together with those of their work-people. The plan has, I know, in some instances, been adopted with the best results. While a first-rate instruction is obtained, the higher fees paid by the wealthy provide against the deficiency that is so often found to occur when the children of the poor are alone taught. The funds thus augmented are sufficient to provide efficient training for the most respectable, and a much more efficient training for the poorer children than they could otherwise grasp. It is quite certain that an improved system of education is as much wanted by the class immediately above the labourer, as by the labourer himself; and I think that this plan has indirect advantages, too, of a nature to recommend it to sensible people. By uniting these two classes, many jarring elements would be removed—bitter feelings would be softened, and a good understanding would ensue. Harmony between these lower and adjoining links of the social chain—the great mainstay and support of our national fabric—is no slight or unimportant matter; and we should be ready even to merge all our little prejudices against such a union, if it is one fraught with real good to the community. The last remark I make with the conviction that I shall come across some class notions of "superiority" and "distinction," and all that sort of

thing; but let them be blown as chaff before the wind. We are men, and not children; and it is our glory to be born in an age when mighty deeds are doing. Are we content to stand as pigmies by the side of these sublimities—dwarfed into nothingness by the comparison? As architects of this lofty age, let it be our ambition to put good work into it, so that our children may say of us—“Our fathers built well and worthily; truly they were good men and true, more minded for the welfare of those who should follow them than for their own temporary and fleeting advantage.”

By a united education, which is sacred and practically good, we should be “producing a sympathy between the employer and the employed, a sense of their mutual dependence and mutual duties, a pleasure in the recognition of each other’s joys, and reciprocal condolence in those sorrows which fall to the lot of every rank.” Such sentiments must be reiterated until the ear of the people rings with them, and the inert heart of the indifferent is goaded to action—action, better to come from the motive that urged the unjust judge to grant the widow’s request, than not at all.

I speak generally when I say that in agricultural districts the employer does not encourage the labourer to educate his child; indeed, his mode of thinking and acting is against it. He does not believe that the respectability of the labouring classes would be advanced by education: this usually occurs when he lacks it himself. If he does believe in the elevating tendency of education, he is too jealous of bringing the poor near to himself, to promote it. This is truly selfish; and as selfishness always finds its reward, so it does in this case, for the proportionate advance that necessarily must follow in the higher the upward movement of the lower classes, is not made. If a farmer has no notion of worth in the labourer as a man, but only values him for his utility as a machine—if he does not as a Christian (save the mark) perceive that it is any part of his duty to improve the moral condition of those around him—if he does not see that by making his men more what they were originally intended by God to be—more honest, sober, and well conducted—he augments his own wealth, comfort, and respectability, of course he will not stir a finger to help the poor to procure the inestimable benefits of education. With him, the labourer who spends his money in the beer-house will be a greater favourite than the sober workman; the man who neglects his children will *practically* be considered as useful and recommendable as that man who is careful in their bringing up, and struggles hard to get his children an education, to raise them above the degraded habits to which they have been so long accustomed. He will perpetuate ignorance and poverty, and pauperism and crime, with his *mere*

subsistence money system: he will perpetuate and increase drunkenness with his *beer and cider truck system*. Let him take the consequence. The curse of generation after generation is not a light thing!

I beg my readers to remember the sketch I gave of what was doing for the workpeople of Price’s Patent Candle Company—of the many thousand pounds annually laid out for their improvement by the *approving vote of the whole proprietary*—a vote accompanied with this never-to-be-forgotten assertion:—“*Independent of all moral grounds, the kindness, sympathy, and attention of an employer to his workmen is the safest and most profitable money speculation in which he can engage.*”

I was speaking of the value the poor attach to good education. The higher they pay, the more they value it, and benefit by it. One father said, “Sir, it gives me such pleasure to see what my boy is doing, that I would even live on bread and water to send him longer to school.” Many parents, to my certain knowledge, have echoed this noble sentiment.

The Reverend Mr. Dawes, in his report of his school at Kings Somborne, remarks—“I have never known a single instance of a farmer encouraging the labourer to send his children for a longer period to school, however trifling the work he wanted them to do. I have known instances of a parent wishing to continue a child, but his employer preventing him by requiring his services when so young that it would have been far more creditable to have employed an older boy.” How much better would it be—in such a case as the above, for instance—for the farmer to give the poor man an additional shilling a week, to enable him to send his boy to school! Would he lose by it? I know human nature better. Where there is one parent who can pay a penny or two-pence a week for schooling, there are twenty that cannot pay anything. And those that do pay, pay, as we have seen, at such considerable self-sacrifice; and even those, can allow their children to attend school only during slack times, till they are eleven or twelve years old, when they are removed altogether.

If we desire to behold such a state of broad-based and substantial prosperity as the annihilation of Ignorance such as the enthronement of Intelligence can alone create, or is alone consistent with, we must see that the parents we employ have both the *means* and the *will* to educate their children.

No. XXV.

“For I doubt not through the ages one increasing purpose runs,
And the thoughts of men are widen’d by the process of the suns.”

ALFRED TENNYSON.

This question of education meets us, my readers, at every turn. Nothing is started by way of social reform, but it is sure to arise. “Take,” as

was well observed at the Barnsley Mechanics' Institution, "the question of sanitary reform: Why do people live in bad cellars, surrounded by filth and disease? You say it is their poverty; but their poverty comes as much from their ignorance as their vices, and their vices often spring from their ignorance. The great mass of the people don't know what the sanitary laws are—they don't know that ventilation is good for health—they don't know that the miasma of unscavenged and unsewered streets, or impure alleys, produces cholera and disease. If they did know these things, then," &c., &c.

Again, "If the working man is deprived of those recreations which consist of the intellectual and moral enjoyments that education and good training gives, he naturally falls into the excitement of sensual indulgence; because excitement all human beings must have. Therefore, when you wish to make them more temperate, and secure moral and sanitary and social improvement amongst the working classes, education, depend upon it, must be at the bottom of it all."

Furthermore, with reference to education, and the Preston strike. "When masters," says he, "and men understand the principles upon which the rate of wages and profits depend, they will settle their matters and arrange their difficulties in a less bungling way than that which now brings so much misery on all parties to the quarrel. It is ignorance on both sides, and deplorable is the result."

The statistics of crime have for a series of years been represented in strict connection with those of ignorance. We are particularly informed by the criminal calendars of how many of the convicted can sign their own name—of how many can write, and read, and how many names are represented by the X—a very bad sign, I remember, at school. And why is this? Because they stand in the relation of parent and child, and so are close companions. I speak only of the crime that is or can be publicly recorded and sentenced. There are species of vice over which education has no control; for education cannot *change the heart*, nor *eradicate* its evil propensities. I allow that it frequently gives a keener edge to a vicious disposition, and makes men peculiarly clever and subtle in the commission of crime, to the bafflement of all Inspector Bucketts that ever were invented; but this is the exception—the rule is, that education induces respect to the law and the requirements of society. The counties most noted for ignorance are most notorious for crime.

Do what we will—provide a schoolmaster for every fifty children—secure ample room—and pay the workpeople on the remunerative instead of on the bare subsistence scale for labour—and I know very well that even then neither adult nor juvenile crime will be stopped. Till *parents* do their duty, and parish officers—in *loco parentis*—act up to their re-

sponsibilities, and all laws bearing upon the employ and treatment of the young are made wholly just and morally effective, a certain average proportion of theft and misdemeanour by children, and baser crime by adults, will be committed.

But it is a different question whether we shall have such a proportion as 15,000 prisoners a year under seventeen years of age out of our population, or whether we shall have 5,000 or 1,000. To expect that no boys, under the most perfect training, would turn out vagabonds and rogues, would be Utopian; but common sense commands us to use all lawful means to reduce the number as much as possible.

To leave this work to statesmen and philosophers would be to shirk our duty. We must do it ourselves. Livingstone, the American statesman, gives a very florid account of what the schools of Boston have done for that city. He says that, though they have been in operation more than ten years, and on an average more than 3,000 have been educated at them every year, not one of those educated there has been ever committed for a crime. In New York," he says, "a similar effect has been observed. Of the thousands educated in the public schools of that city, taken generally from the poorest classes, but one, it has been asserted, has ever been committed, and that for a trifling offence."

One is apt to look at this extraordinary statement as but one of the many specimens of the pleasantry of "that most remarkable nation in the world"—a slight fetch on the part of brother Jonathan—were it not made in a serious manner by so eminent a man, and found moreover in his Statistical Report to the Code of Prison Discipline for Louisiana. A witness sometimes endangers the cause of him he wishes to serve by proving *too much*.

The *small amount of distress* that exists in America, however, the *sound education* provided, and the *strict religious training* for each and for all, reduce the improbability of such a state of things. And while we may not hope to obtain to such a pitch of perfection, we may yet, as a young friend of mine expressed it, blushing before his first audience, and making nervous evolutions with his coat-sleeves round his hat, "*attain to some degree of mediocrity—every man may do that!*" So consoled and encouraged, let us just look at another part of the subject.

What is the use of trying to educate the children, if we do not also do something towards improving their *homes*? The good lessons they learn at school they should, by rights, see carried out and exemplified at home. This is one of the most valuable accessories to the school. If a child unlearns in six hours amongst vicious companions what it has taken six hours to learn under school training, what is the use of wasting time upon education at all? The homes of the labouring poor are very often the nurseries of

corruption, the hotbeds of vice. They remain undisturbed; little, indeed, is attempted.

The home I speak of here in two senses—in one meaning the family, in the other meaning the material fabric. It is only by personal endeavours to lessen the distress amongst our workpeople that we can hope to elevate the tone of their every-day life. Cottage builders must bear in mind that they have more to look to than their mere money return; and so long as capitalists are bent upon manufacturing fortunes out of the blood and bones of their fellow-men, so long will this sore wail of poverty go up from our streets! Is not every moral sense necessarily dulled thus?—is not all thought and feeling debased?—are not cheating and lying the earliest lessons?—and when we expect the fruits of education (the habits of industry, and honesty, and fair dealing between man and man) to spring up amidst the scenes, or in spite of the counteractive influences of filth, and violence, and vice thus engendered, are we not looking for “grapes from thorns and figs from thistles?” Novelists may, ’tis true, exhibit lilies of unwonted delicacy, the growth of sinks and sewers the impurest, and show that virtue blooms in the atmosphere of the most virulent profligacy; but you and I know better, good reader.

Then are the dwellings of the poor, merely as dwellings—merely, I mean, as brick and mortar, lath and plaster, stud and clay, arranged or misarranged walls and partitions—the preparatory training schools for the gaol. There speak *generally*, of course.

The first step—and the Duke of Bedford has, I believe, made a good one in this direction—is to provide suitable residences for the cottagers. This is a grave moral question.

The accommodations such miserable huts as we so often see around us offer, are not such as decency requires. When human beings are huddled together (as I have frequently seen them) with respect neither to sex nor age, what a mockery is it to expect that a child can hold its purity! What can education do against this, when all its choicest precepts are so grossly violated? Sanitary regulations, and comfortable, rooey cottage building, must act as handmaids to good schools, or all teaching of the masses is in vain. We must arouse amongst what are called the lower classes a greater love for domestic enjoyments, and we must afford them the opportunity, at their own cost, of obtaining such. Home must have what it now in so many instances lacks—attractions superior to the beer-shop. The labourer asks no alms, but he requests that attention shall be bestowed on the amount of moral and physical contamination in which he is compelled to rear his family, and seek, after his day's toil, his own rest.

Till this is done, our building of schools, our form-

ing of committees, our raising of funds, are of no avail; the exciting words of agitators are eagerly run after, and sullenly nursed by the discontented? And who can wonder?

Virtue must have a *home*. Sound policy, true philanthropy, would give her one.

Here, ye capitalists, is an answer to your oft-repeated question, “Where shall I invest this money?” Erect good cottages, good lodging-houses for our labouring people, cheap, and clean, and commodious, with rooms for reading, for evening schools and lectures near at hand, and your returns will exceed those of the toiling diggers in the Australian gold fields, or the much-esteemed 10 per cent., accompanied with the additional advantage that your hearts will be lightened and gladdened by the consciousness of having done a good deed.

How shamefully neglectful are some of our great landowners in this respect! They let their cottage tenantry *pig* together. For what else can we call that state of things in which families of four and five, seven and ten children, of both sexes and all ages, are usually confined in two sleeping apartments, often, indeed, to one? Is there not severe blame attaching here? And then, what shall we say of that system of forcing the labouring poor, for the sake of escaping the poor-rates, upon already overpopulated towns and villages? And when the landlord catches hold of this mere subsistence system, and applies it to the farmers, what follows? The farmer is a *necessitous* being as well as the labourer; and if the landlord takes advantage of this *necessity* to live by the cultivation of the soil—which is, in ninety-nine cases out of a hundred, imperative—and screws a profit out of it, the farmer is tempted to make his balance right by putting the screw upon his workpeople, and wringing a profit out of their *necessities*.

Thus, between two classes that should be bound by the cord of amity a bitter feud springs up, and strangles all better growths. The farmers are, in numerous instances, forced by the landlords to work against that moral law which commands “every man to work not for his own, but for another's wealth”—which is a law unprofitable and Quixotic enough to many.

I say *forced*, but no man can be *forced* to a wrong thing against his will: I mean, pressed in such a manner as it is extremely difficult to resist. It nearly amounts to a miracle if, when placed in a position where he can scarcely avoid exercising that passion for tyranny which characterizes fallen human nature, a man can withhold from oppression. If he yields to the pressure, he is less culpable than the person who first applies pressure.

Still, because tenant farmers are squeezed, that becomes no reason why they should crush in their turn that class which it is to their interest to protect.

They are strongest, and should resist injustice towards themselves, and then they would be in a position to do justice to their labourers. I am forcibly reminded of a ludicrous scene, given with all the author's knowledge of human nature—I mean that which occurs in Sheridan's "Rivals," in which the irascible master Captain Absolute, rates and cudgels his valet, Fag; Fag, to vent his spleen, kicks the scullion down-stairs; and the scullion, aching from the effects of the superior's ill temper, passes the kick to the unoffending house-dog with accumulated interest.—"Well," you say, "if the valet had replied, he would have lost his situation; and, if I complain, I shall lose my farm." But would not the risk of that be better than to be a party to the transmission of injustice?

I say again, withhold not on the Saturday night from the labourer any part of his just dues; and have done with pauperism. What is offered him in two shapes, that of wages and charity, he would rather receive in one; because that *one* would involve a recognition of a *right* more dear to him than soup-tickets—a recognition that would go far to make a strong, willing man of him, with a spirit in him for good.

When Ignorance costs so much per head, and Pauperism so much more, and Criminality so much more, and Juvenile Delinquency so much more, and Objects of Distress continually crowding around us so indefinitely increase the expense—when Australia and the Cape, and soon our colonies generally, refuse our human refuse, telling us, in curt phrase, to manufacture less, or cry in passionate terms, "Send us not a scourge!"—when the question is being asked, "What shall we do with our criminals?" and the reply given to it is, "We must keep them at home!"—it is the duty of every mother's son to become a serious and clear-headed politician.

But be so good, kind reader, as not to run away with the notion that I mean by the word *politician* a noisy, violent, one-sided party man, who swears that white is black if yellow says it is so, or who believes in the immaculateness of blue. Don't suppose that I mean necessarily a member of the great "Council of National Palarii," as Carlyle calls it; nor that I mean a giant at knocking down the institutions of our land, and a baby at building them up: in fine, do not suppose that I would have you mould yourselves upon the model of the politician we read of in the "Tatler," who was intimately conversant with the affairs of All the Russias, with the precise tactics of all belligerent forces, and with the domestic and foreign policy of every nation under heaven, while his family was languishing in poverty at home, and he himself possessed barely a rag to his back! I mean no such thing.

The science of politics touches us nearly. It is a matter of the utmost moment to every man, woman, and child, and *should be made a study*. With its fibrous filaments it ramifies all society. Individual happiness, and health, and wealth are its objects; and in proportion as we attend to the sources of these, and busy ourselves to preserve their purity and promote their growth, so will be our reward.

Our representatives in Parliament are not to lead us; but we, by the expression of our wants and opinions, are to lead them. But if the people know not the way they would go, they must perforce be led; and so the cunning take advantage of the simple, leading them into many snares and pitfalls, to their detriment and destruction.

Moral duty cannot be performed by deputy. It is a moral duty for every man to be informed of the affairs of his own household—*ergo*, &c., &c.

Let us once more remember, that if we desire to show ourselves earnest in the cause of national prosperity, we must cease to recognise this blasting law of *supply and demand* as the one great regulator of the recompence given by the master to the servant for labour done. Indeed, my readers, *the necessities of the poor must not be our stock-in-trade!* The precepts of Christianity are all against us. Our consciences condemn us. We experience a dissatisfied feeling as surely as Saturday night comes round. And why? Because we feel that we are *confirming misery, and wretchedness, and suffering*, ay, and *vice too, and not alleviating either*.

It may be thought by some that in these letters I have expatiated too exclusively on the selfish side of the "do as you would be done by" text. I confess that I have done so designedly.

There are evidently, considering the two classes of people with whom I have to do, two lines of argument to be pursued—a higher and 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, as I think I have done, I preclude the possibility of contention respecting the higher. I have, therefore, for this reason, confined myself to the more perfect enunciation of such maxims as these—*Humanity, like honesty, is the best policy, Liberality is the truest economy*, &c.; being convinced that, could I but prove that heavy dividends resulted from humanizing efforts, they would then be adopted as current coin by the many. And how else are you to argue with the man whose invariable question is, "*But will it pay?*"

Our actions must, however, proceed from a nobler sentiment. A fair day's wage must be paid for a fair day's work; and a *moral law, not selfish inclination*,

must regulate the decision. The minimum of self-support must not be the standard. Not, *How little can I afford?* but, *How much?* A man's wages, to prevent pauperism, even with providence, must include a sufficiency, *besides* present subsistence—a sufficiency to pay for his maintenance, first, during the slack season; second, when out of employment; third, when ill; fourth, when old. If married, his wages must include more—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, they being allowed to run wild, and pick their morals and

education out of the gutters; or else the whole family must be transferred to the care of the parish.

But we must lift men above this bare escape from pauperism.

“This is the law for mortals ordained by the Ruler of Heavens: Fishes, and beasts, and birds of the air devour each other; JUSTICE dwells not among them. Only to MAN has He given

JUSTICE, the highest and best.”

HESIOD.

Let us spin our silken sympathies every man by his own fireside; and these separate threads, gathered and woven, shall form one strong bond of brotherhood that shall circle all peoples, and ultimately girdle the world. F.R.S.

HOP CULTURE.—THE CHALK DISTRICT OF KENT.

Having just completed a tour through the chalk district of Kent, we rejoice to be able to report favourably of the progress of wheat-sowing now closing. The present high prices have caused every exertion to be made to sow as large a breadth as possible, and generally speaking it appears to have been put into the ground under favourable circumstances. Towards the latter end of October the farmers, alarmed by the continued rain, which threatened as long a duration as that of the last year, were tempted to puddle in seed on the flinty clays, the sowing of which would better have been delayed if the change in the weather could have been foreseen. A considerable portion is up, and looking well; but it comes up slowly, and there is much now in the milk which would receive material injury from the setting-in of a severe frost.

It will surprise some readers to hear of stiff clays on the chalk; but so it is. There is, in point of fact, but a very small proportion of that rock in Kent which is not covered by argillaceous superficial deposits, of various depths and degrees of tenacity, but generally inclining to stiffness. White chalky soils constitute the exception. They are found chiefly on the steep sides of valleys, and on the summits of sharp hog-backed ridges. The tabular summits of even the highest parts of the range are generally covered by a deposit from 2 to 5 ft. deep, called by Boys (the author of the “Report to the Board of Agriculture” on this county) by the expressive name of “cledge.” He describes it as “clay on the tops of the chalk hills, much mixed with flints, cold and tenacious, and requiring six strong horses to plough an acre a-day, and when not ploughed till dry in the summer, hardly practicable with eight horses, sticking like bird-lime when wet, and forming clods, when thoroughly dry,

so hard as not to be broken by the heaviest roller. It yields,” he adds, “when well managed and in favourable seasons, good crops of wheat, beans, clover, and oats; but in seasons unkindly for working and in dry summers, it is very unproductive. This cledge is neither sand, clay, nor loam; but an irregular mixture of all the three with numerous large and unabraded flints. It has been formed from the wreck of the chalk and some of the overlying tertiary sands and clays. The former extension of these over the whole of the chalk, and probably over the area of the Weald—a valley of denudation—is proved by the outlying patches of the older tertiaries which are found at the very edge of the chalk escarpment. There are considerable modifications in the character of these cledge soils on the tabular summits of the chalk, as clayey or sandy materials prevail in their composition. The poorest and stiffest varieties are found between the gorges of the Darent and the Medway. Even where the surface soil on the tabular summits is a freer loam, the cledge subsoil often renders it wet and cold.

From the re-arrangement of the cledge by subsequent aqueous operations, have resulted all the better loams lying upon the chalk, their quality varying with the elevation and form of surface. On the long slopes of the hills, and in hollows in the higher portions, there are deeper and more productive soils, in which the sand and clay derived from the cledge are more intimately combined into loams more or less friable, with a general diminution as we descend, both in the size and quantity, of the flints dispersed through them, till we come to the low grounds skirting the alluvium of the coast and of the valley of the Thames. We have there loams three feet deep and more, with some flints resting upon beds of a more sandy loam or brick earth, frequently exceeding five feet in depth, the whole being often based on a bed of flints.

* Dr. Chalmers.

There is a marked difference in the aspect of the flints in the original cledge and in the soils derived from it. In the former they are as fresh and un-abraded as if just detached from the chalk, but stained with a yellow instead of a white coating: in the latter they are for the most part sharply fractured. These fractured flints, with their fractures slightly water-worn, are frequently accumulated in beds in the bottom of the valleys, and form rude heaps and irregular terraces of flints imbedded in a loamy matrix near the heads of valleys, or near their narrow gorges. The causes of these variations of soil are discussed in detail in several papers in the *Quarterly Journal of the Geological Society*, vols. 7 & 8, "On the origin of the soils which cover the chalk of Kent."

All these loams, whether wet or dry, retentive or friable, are worked throughout Kent with very few exceptions, with that venerable relic of antiquity—the turnwrest plough, rarely with less than four horses, sometimes with more. In one or two instances we observed ploughs at work, of the same pattern, but of a lighter construction, worked by a pair of horses, without a driver. To do everything by main force, and to obtain the greatest possible amount of friction in every part of its construction, which are the ruling principles of the turnwrest, will operate against its general adoption as a two-horse plough. Those Kentish farmers, therefore, who are beginning to see the necessity of reducing the number of horses which devour them, have had recourse to iron ploughs with wheels, worked by three horses harnessed two abreast with a leader. The discarding of the leader will follow in the course of time. When urging—we think in 1830—on a Kentish farmer the practicability of working his land with two horses, he replied that it was impossible "Your little kicketing ploughs," he said, "your improved turnwrests have been tried over and over again, and they won't do. Our soils are much stiffer than they appear to be, and our old-fashioned Kentish plough the only one with which they could be worked. We have often difficulty in ploughing them with four horses." Revisiting Kent after a lapse of twenty years, we found our friend had made the discovery that with the iron plough above mentioned he could do very well with three horses what with his former favourite, the turnwrest, he could scarcely accomplish with four. It was during the period of low prices; and he added, "If we cannot plough with three horses, we must give up ploughing altogether." With some alteration in the construction of the iron plough, there is no doubt that the leader and the driver might be dispensed with. Will it require another twenty years to convince our friend of this? Surely a shorter term will prove sufficient.

During a recent tour through Kent, we found our farming friends, who are hop-growers, in high spirits. There were many complaints of the yield of wheat, and of six and seven sacks being thrashed this year where the average produce is in other seasons as many quarters; but, as regards the hop crop all was exultation. There is nothing so much dreaded by the hop-grower as a productive season of a crop with which the market is so easily overstocked.

A growth of 4 cwt. to the acre at £15 or £20 is more remunerative than one of 10 cwt. at £4, or of 15 cwt. at £3 10s. Besides which, in deficient seasons, every man is looking for one of the prizes in the hop-lottery, which, with so uncertain a crop, is obtained by some of a full yield, when the majority of the neighbouring grounds have not enough hops on the poles to pay for the picking. What must it be, then, when with a season like the present—which, though not good, is by no means generally unproductive—these prizes fall to the lot of many? thanks to abundant employment at home and the large export of beer to the Australian colonies: a season in which the produce reaches 8 cwts. to the acre, with an average price hitherto little under £15 per cwt. Well may it be said that the hop growers are coining money. We have heard many confess, and some few boast, that they would not exchange their hop crop of this year for the fee simple of the land on which it grew.

We heard of many farmers who, with four or five acres of hops and one hundred acres of wheat, had sold the produce of the former for £500; while as regards the wheat crop, the increased prices, from 40s. to 80s., quite compensates for the diminished yield, even if the diminution amounts, according to the most desponding statements, to one-half. This is one side of the picture; but it has a darker side. It may be doubted, and more than doubted, whether on the whole Kent is the richer, or better, or happier for its hop grounds. The general results to the tenantry may be expressed in the words of a shrewd old farmer, who, on our expressing surprise that, holding 1,500 acres of land, he had no hops, declared that he never knew them hop into the pocket—at least, if they did, they managed, somehow or other, to hop out of it again.

Its effects on the landlord may be expressed in the words of another farmer in the Weald, who is reported to have said, some half century ago, when the relations between landlord and tenant were not so well understood as at present, that he would hop one-half of his farm, and dairy the other; and if that did not break his landlord, he did not know what would. Its effects on the peasantry are expressed in a proverb current in Kent—but which we will not repeat out of it—as to the products for

which the county is famous. In such sayings, the superstructure of bitter satire bears a very large proportion to the substratum of truth. The moral effects, however, of the hop culture on the peasantry—in consequence of the swarms of itinerant pickers with which it brings them in contact, and the speculation and gambling which it encourages among the farmers—are such, that Kent has little reason to exult in her hop gardens, fair though they be to the eye, and even though they were a mine of wealth, which they are not.

There are romantic associations connected with Kent which cause an exaggerated importance to be attached to the hop culture, which constitutes one of its distinctive features. Who that has traversed that county on the eve of harvest has not been struck with the beauty of its landscape? he sees every evidence of a county which has been long under cultivation.

“Kent, in the Commentaries *Cæsar* writ, is called the civilist spot of all the isle.”

He sees decent cottages and comfortable farm-houses, the abodes of the proverbial Kentish yeomanry—

“A Squire of Wales, and a Knight of Cales,
And a Laird of the west countrye;
But a Yeoman of Kent, with his annual rent,
Would purchase all the three.”

He passes lordly halls, snug personages, and venerable churches, studding an ever-varying scene of corn-field and woodland. He sees orchards bending beneath the weight of their fruit, and bowing hedges white with the lovely Clematis—well-named “The Traveller’s Joy.” He passes arsenals and dock-yards, and the Palace Hospital of our naval veterans. He catches glimpses of the broad and silver Thames, crowded with the sails of our mercantile marine; and he sees the leviathans of our war ships floating on their shadows and slumbering in their strength. He passes ruined palaces and castles and abbeys, and hoary cathedrals which have survived them all. He passes spots consecrated in the brightest pages of our history and our song. He is reminded of Gadshill, Falstaff, and Prince Henry, Ethelbert and Augustine, the shrine of A’Becket, the tomb of the Black Prince, the throne of the kings of Kent, the spots where *Cæsar* and Hengist landed, where the conquering Norman conceded to the unconquered men of Kent their Saxon gavelkind, and where Elizabeth headed her troops to repel the Spanish invader. These and a thousand recollections crowd upon his thoughts while ever and anon he catches sight of the graceful festoons of some hop-ground, more beautiful than any vineyards except those of Italy.

Why he knows not, but to the hop-grounds he is led insensibly to ascribe much of the comfort and prosperity, as well as the beauty, which gladden his eyes, and they become associated in his mind with the wealth and the glory and the grandeur of Britain. He traverses the same scene a few weeks later. Kent-street and St. Giles’s have poured forth their banditti: he loathes the hop-grounds, and sighs over the moral pestilence with which they contaminate the fair fields of Kent.

Equal disappointment is his who views the hop-grounds solely with an economic eye, and weighs them in the balance of profit and loss. Hops are, strictly speaking, a garden crop. Their introduction into arable farming has been considered more or less pernicious to it, by every agricultural writer who has treated of them, in every county in which they are grown. By means of the excise duty on hops, we are furnished with that correct statistical information respecting them which would be so valuable with regard to other kinds of agricultural produce. These details reduce the importance of the hop crop, as a branch of British agriculture, within very narrow limits. It appears from them that the total value of this crop does not exceed one part in one hundred and forty of the estimated average annual value of the total agricultural produce of the United Kingdom. Through the instrumentality of the Excise returns, we know to a perch the total area under cultivation in any given year, and we know to a pound the produce of that area. We have not at hand these returns for a later period than 1846; but for the thirty years preceding that date it appears that the average annual produce was 6 cwt. 1 qr. 8lbs., and the average price £6 19s. per cwt. The extremes of average produce during the period were 11 cwt. 5½lbs. and 1 cwt. 8¼lbs.; and it is a curious fact that they occurred in consecutive years. The extremes of annual average price were £27 and £4 4s. the cwt.

Hop-growing has been denounced, as we have said, as unprofitable on the whole, by every agricultural writer on the subject; and experienced growers concur in the opinion, if indeed it did not originate with them. They declare that a large portion of the hop-grounds never can pay, because planted on an uncongenial soil; that hop-growing is the gambling of agriculture; that it drains the rest of the farm of manure and capital, and that the chief inducement to engage in it is the chance of prizes in the hop lottery, in the pursuit of which the certainty of the blanks is overlooked. Mr. Pooke, an extensive and experienced hop-grower, declared to Arthur Young that with a piece of £4 per cwt. hop-ground, averaging 8 cwt. to the acre, it yielded no profit. And he supported the assertion by the following estimate:—

	£	s.	d.
Constant expenses—labour, poles, and manure	18	2	6
Picking, drying, duty, and sending to market, £1 10s. per cwt.	12	0	0
	£30	2	6
By returns, 8 cwt., at £1.....	32	0	0
Balance	£1	17	6

From this it appears, that with the above produce and price, the excess of returns above expenses, out of which rent, tithes, and tenants' profit are to be paid, does not exceed one pound seventeen shillings and sixpence the acre.

THE APPLICATION OF MANURE TO THE SOIL.

SIR,—The paper read by Mr. Douglas, at the Anniversary Meeting of the East Lothian Agricultural Society, inserted in the *Mark Lane Express* of last week, contains an excellent system for the *cultivation* of the soil, particularly for heavy land, and proves him to be a thinking practical agriculturist. His mode of applying the manure immediately after harvest, by ploughing it into the land and covering it with a deep furrow, is a great improvement on the general practice of accumulating it until the month of May, to be then put into ridges for green crops. This too general practice, occasioning too much work to be done in a limited time, requires a greater force of manual and horse labour than is necessary when the labour is more equally divided and apportioned over the year, which constitutes the best arrangement for the most economical application of it.

The most economical application of *solid* farm-yard manure is to apply it to the land as it is made, or in a green state, as some call it, in preference to allowing it to accumulate in a large quantity, by which much of the best parts are lost by decomposition and evaporation, however they may be attempted to be preserved.

The idea of feeding "the soil," or rather the plants, according to the new mode of feeding horses, by giving food often and in lesser quantities, is correct; but this mode can only be fully carried out by the use of *liquid* manure, which is the most efficient system of feeding the farmer's crops, both as economizing the material and also the labour in its application. Mr. Douglas' arrangement of green crops would be much improved by having an equal extent under mangel-wurzel and turnips, the former keeping when stored much later in the summer; and instead of sowing the clover and Italian rye-grass together, to have an equal extent of land under each of these; thus making an eight or ten course rotation, instead of a four or five course. The clover would not be repeated on the same land too often, which would also be an advantage to the green crops. The Italian rye-grass is the quickest growing plant we have for soiling, and when dressed with liquid manure after each cutting will produce from four to six cuttings during the summer, according to climate; and being a plant that does not purge stock when fed upon it, it is very suitable for alternate feeding with clover, which has that tendency: alternate feeding with different food being also better for stock than constantly using the same kind.

It is now a well-ascertained fact, that when the manure made on a farm is under proper arrangements, all applied in a liquid

state to the general crops, the produce is more than double than what the same manure would produce in the ordinary mode of management in a solid state, and the expense of applying the liquid is not one-fourth of the expense of applying the solid. There is no mode of applying solid manure, in whatever quantity, that will produce so good an effect as the liquid will produce in a moderate quantity, as it can be used in dry weather, in every stage of growth of the crop, being, in solution, the state adapted as food and drink, ready to be assimilated by the plant immediately on its application.

The expense stated by Mr. Mechi to be incurred on a farm for the application of liquid manure (£6 an acre) is double what is necessary for the purpose. He must have included other expenses, and should have stated particulars, as such a statement is likely to deter many from adopting the system.

Gentlemen who have ample funds, and are not practically conversant with the improvements they attempt, may often incur expenses that are unnecessary, and thus frequently pay dearly for what they learn, deterring others of more limited means from adopting improvements that would be beneficial to them. Few men are more enterprising in agricultural pursuits than Mr. Mechi, and scarcely any have laid out more money in experimenting, in proportion to the extent of land, than he has; but it is a question if many tenants could have done so for the same return. His kindness in exhibiting his farm, and his hospitality to those who inspect it, are unsurpassed; and however precipitate he may have been in adopting some new ideas, he has not attempted the application of manure in a liquid form precipitately, as he sat in committee, in 1845, when the subject was introduced to his attention, and fully developed by evidence, since which it has been adopted by several to great advantage, and ultimately will become general, as the means may become available.

To expect that improvements in agriculture must necessarily be *immediately adopted*, irrespective of the means required, however desirable they may be, is inconsistent with mature consideration. It cannot be expected that tenants will invest their capital in *permanent* improvements on the property of their landlords, without a certainty of its being repaid during or at the termination of their occupancy; therefore the necessary arrangements respecting such outlay or expenditure have to be made before it can rationally be expected that tenants will (if they even had the means) incur the expense in such improvements that too many blame them for not effecting. Their comparatively isolated position also prevents that interchange of ideas so necessary to facilitate progress, and even when the necessary arrangements between landlords and tenants are made and funds available for the purpose, it takes some time to effect any considerable change in agricultural management, which is not the case with the manufacturers; their establishments generally only require some attention in their machinery, which is soon effected; hence the thoughtless accusations made by them against the farmers for want of progress.

There is scarcely any error we are more subject to than that of neglecting or overlooking that which we have within our power, and looking for a substitute from a distance. This is fully developed at present in the efforts made to obtain from a great distance the article of guano, while we are neglecting to save and allowing to waste annually on our farms and in our towns materials of ten times the value of that which we could obtain from such a distance, under any circumstances. The loss sustained by the waste of manure on the farms of Great Britain, as at present managed, and in the towns, is equal in value to the whole of the profit on the trade and commerce of Britain. This may appear to some parties an exaggerated

statement; but it is capable of being demonstrably proved, and it is only by presenting the subject in a strong point of view that the necessary attention can be obtained, so as to induce all parties interested to co-operate in making available that which we have within our own power as a raw material for the

manufacture of food for our increasing population; and it is to be hoped that the present scarcity and high prices will stimulate exertion, that we may not be so dependent on other nations to feed our people. Yours respectfully,

Jan. 17, 1854.

JOHN JAS. MOORE.

THE ORIGIN, DISTRIBUTION, AND IMPROVEMENT OF OUR BREEDS OF CATTLE.

Much irrelevant disquisition has taken place as to the origin of our domestic animals. The writer of the article "Cattle," in the "National Cyclopædia," even goes the length to say, "All nations which have it" (the ox) "acknowledge its utility, *but its origin is not ascertained,*" (?) following up this startling proposition with the proof that it is not descended of the urus, zebu, or even the wild cattle of Chillingham Park!

The origin of our domesticated animals, as given by the sacred historian, is satisfactory, and must be held as conclusive by every one: "And out of the ground the Lord God formed every beast of the field and every fowl of the air, and brought them unto Adam to see what he would call them; and whatsoever Adam called every living creature, that was the name thereof." At this period there were no wild animals or hybrids, but one family, unalloyed as to blood, and in the highest degree of perfection as to quality. At the Deluge, again, we read that Noah preserved the clean beasts by "sevens," and the unclean by "twos," "the male and his female." Facts so simply and beautifully stated are beyond scepticism.

The interesting question to the historian and physiologist is, the distribution of the animal kingdom over the globe, the alienation of many of its members from the domestic society of man, and the almost illimitable extent to which degeneracy and hybridization have taken place throughout the whole. That the different families were perfect at first, cannot be doubted; and the question naturally suggests itself, which is now the nearest to the original? In the case of the ox, for instance, is the shorthorn the best representative of this species of the bovine family? or does the Hereford, Devon, or Highland breed approach it nearer? Or are the European breeds of cattle descended from the zebu, gayal, or yak, domesticated in Asia and Africa, and these three descended from some individual oriental breed not now known?

We can readily look back to a state of original perfection; and it does not require a great stretch of imagination to look forward to a similar state looming in the future: for that, during the barbarous period of the past, cattle have degenerated, and become what we now witness them, is a fact which requires no proof; and that all our improvements have for their object to restore nature to its original state, as it were, is a plausible proposition. But the question still remains to be

answered, What was that original state? Unless we can ascertain this, we are as men groping their way in the dark, and, therefore, can never arrive at anything like unanimity in the great work of improvement.

The grand question at issue is, the best model of an ox—one which returns the greatest quantity of butcher meat or dairy produce, of the best quality, from a given quantity of food. We can form such a representation in the mind, and in practice, by judicious selection and management, try to bring up the different breeds to it; and, however far we may as yet be from anything like similarity, it is, nevertheless, impossible to set limits to progress in this direction by artificial means. Such is the field before us.

We fear, however, that the general error has been a proneness to trace our different breeds of cattle to a common parentage and locality, inconsistently with the great object for which they were originally created; and that animals were constitutionally framed for all the vicissitudes of climate and circumstance which have since been experienced by them. When we examine the different provinces of the globe, and perceive how admirably adapted their animals are for their several wants, it is no more than prudent to be cautious in drawing conclusions at variance with the harmony of such a state of things. We are not here, however, inferring that the stunted ox, pony, and sheep of our own country, so varied in soil, climate, and circumstances, are fair representations of any animals preserved at the Deluge, much less when first created.

Now, as ample provision was made for the whole, not only during the time they were in the Ark, but also for the immediate wants of Noah and his family on their egress into the plains of Ararat, it consequently and naturally follows that the command had reference to breeding stock only. Indeed, this is expressly declared in these words: "To keep seed alive upon the face of all the earth." If there existed different breeds of each sub-genus before the Flood, adapted for diversities of climate and food, as there no doubt did, then a bull and a cow were necessary for each. Hence the inference that there may have been many different breeds.

The number of breeds has increased. Granting, for the sake of argument, that there were many varieties of the taurine branch of the bovine family preserved at the Deluge for the restocking of the globe, or for the subsequent use of mankind, there are many more varieties

now, the Indian or humped ox being considered a distinct sub-genus by itself. The command necessarily limits the number to seven; but when we examine Europe, Asia, Africa, and the continents of America, we find many more than that number, each possessing all those characteristics essentially necessary to distinguish the one from the other as a different breed, such as the shorthorn from the Devon, or the Galloway from the Highlander.

The increase of breeds which has taken place has arisen no doubt from crossing. In some cases those crosses may have been judicious; but it is to be feared that, generally speaking, the reverse has been experienced, viz., that they have been productive of mongrel races of an inferior quality. If the breeds were perfect at first, as they must be admitted to have been, the possibility of improving upon them is excluded. Art may vary circumstances, and by that means a cross between two may be better adapted for such than either of the two themselves. If, for example, we suppose that the shorthorn was one of the primitive breeds, and that in its greatest purity it was adapted for a finer climate than that of England—that the long-horns, polled, and Highland breeds, are better adapted for our climate on the old system of management by outdoor feeding—then, under our modern system of indoor feeding, a cross between any two of them may be better than either in a pure state; and it is possible that our present shorthorns is just such a cross. We cannot, however, with any consistency suppose that our native breeds are, or ever were, in a pure state, although attempts of a very unscientific kind have been made to trace the mongrel catalogue they now present to three primary breeds, viz., the polled, long, and middle-horns. But granting, for the sake of argument, that such was the case, or that the whole are the offspring of three primitive pure-breeds, then each by crossing with the other two would make two cross-breeds, or the three six; so that altogether we would have, from one cross only, nine distinct breeds of native cattle, six crosses, and three pure. It is easy, therefore, accounting for the multiplication of breeds; for, according to these data, the seven, supposing such to have been the primitive number, would in all probability, if herded together, have produced forty-two crosses and seven pure-breeds, in all forty-nine before the dispersion at Babel. And besides these, a few crosses may have taken place between the taurine, bubaline, and bisontine families. So long as the whole human family lived together with their flocks and herds, in defiance, as it were, of the Divine command to separate themselves and people the different divisions of the globe, as the confusion of tongues compelled them to do, it were difficult to suppose it otherwise. It would hardly be possible under such circumstances to prevent crosses taking place, and even mixtures of blood to an indefinite extent almost; while the confining of them to the scorching plains of Shinar would have the effect of alienating the more hardy breeds adapted for colder

climates from the parent stock, and also those adapted for a climate more sultry still than the plains of the Euphrates and its tributaries; hence the origin of wild cattle differing in nothing from the tame ones in a state of domestication, unless what the laws of nature had instinctively taught them as necessary to defend themselves in their new state, where man was no longer their guardian and defender from the inroads of beasts of prey; and hence, also, the early sport of hunting the wild bul in every climate of the world. Now, it is worthy of peculiar notice that this alienation from the different breeds of the parent stock forming wild herds, and their separation in different directions to the climates peculiarly adapted for them, would have a tendency to preserve the purity of breeds among them better than among the parent stock, because there would be less opportunity afforded for crossing. In other words, our wild breeds are purer than our tame ones—a conclusion amply verified by practice; for the former are everywhere freer from a mixture of foreign blood than the latter. At the same time, it cannot be affirmed that our wild breeds are entirely pure, because of their having herded with the others, both before and after the Deluge.

It would be an important acquisition to science could it be ascertained how many varieties or breeds there are, and the localities best adapted to their respective constitutions, both in the case of domesticated and wild breeds, as it might afford means for coming to more unanimity as to original breeds in a pure state than otherwise can be done, and therefore lay a more sure foundation for their improvement. But, from the diversity of opinion which exists among naturalists, such information can hardly yet, we fear, be expected. It is some consolation, however, to know that progress is being made in this department, and that such information may ultimately be obtained, although involved as yet in much obscurity. The grand object of the inquiry, as it comes home to every farmer, is the breed which best suits his own peculiar circumstances and locality, and the improvement of that breed in the highest degree; the question interrogatively assuming the form of—What is the breed which best suits my farm? and What the best mode of bringing it to a comparative state of perfection?

On both these questions opinion is sadly divided, some farmers arguing that house-feeding on properly prepared food has superseded the natural system, by substituting an artificial climate, so to speak, adapted for the best breed of any, and where that breed can be brought to the highest degree of perfection; others arguing the contrary. The shorthorn, say the former, for example, is the best breed in the world; and the artificial system enables us to bring it to a higher state of improvement than it can be maintained in any natural climate or under any migratory system, where herds are removed during the heat of summer to more elevated and colder pastures, and during the depths of winter to the most sheltered and low-lying warm meadows. The latter deny that the shorthorn is

the best breed of any ; but here we again find ourselves in the midst of further division, for each of our breeds has its advocates, while dairymen are generally found opposed to the growers of butcher-meat in every case. On the improvement of breeds, again, we are scarcely less divided—one arguing that purity of blood, with judicious selection and management, is the best plan ; a second, that crossing is the best ; and a third, that all our breeds are subject to degeneracy, and require to be constitutionally renewed at the expiry of certain periods, in order to keep them up to a given standard.

That house-feeding is destined to exercise an important influence upon our breeds of cattle, and their distribution throughout the different climates of the world, is a question which requires no answer. The improvement and distribution of the shorthorns exemplify this in a very conspicuous manner ; but house-feeding is yet far from anything like universality in practice, while other breeds have their advantages, and therefore our theories must conform to our practices accordingly. Moreover, shorthorns are not “hot-house plants” altogether, as some have erroneously supposed.

The origin, improvement, and dispersion of the improved shorthorn breed of cattle form a subject second to none in the management of live stock. The merit of laying the foundation of this breed on a solid basis, has, with great propriety, been conceded to Colling ; but that improved shorthorns existed long prior to his day cannot be doubted ; for although he crossed with the Galloway and Kyloe, yet his principal success appears to have been in the formation of a proper conception, so to speak, of what the shorthorn breed should be, both as to handle and symmetry, and the careful selection of such from a comparatively degenerate family, and judicious breeding from them afterwards. The story of Hubback may be quoted in proof of this. His object in crossing appears to have been to obviate a defect entailed upon the breed by previous crossing and injudicious management generally—an attempt, as it were, to restore nature to her pristine perfection in less time than by watching and co-operating with or seconding her efforts to improve herself. Mr. Bates appears to have followed closely in the footsteps of his predecessor ; and the maxim of Lord Ducie to have nothing but the best, furnishes another conspicuous example. The above three herds of Ketton, Kirkleavington, and Tortworth, to which we may add Mr. Mason's herd, of which the late Earl Spencer bought so largely, and kept at Wiseton, exemplify in the most satisfactory manner the advantages of a judicious selection for a breeding stock, while their dispersion afforded other breeders an opportunity of making better selections than they otherwise could have done ; for had the Ketton herd not been sold, Mr. Bates, in all probability, would not have got Young Duchess, and hence possessed her family—by far the highest, in point of merit, of any at his sale, four of which again passed into Lord Ducie's herd, along with two of the Oxford family. Lord Ducie again had many cotem-

poraries, who not only profited by his more than successful example during the memorable period he so zealously laboured to select and improve his invaluable herd, but also by the last bequest he made them—viz., its sale at his death. The Kirkleavington and Tortworth herds doubtless exhibit all the excellence of the breed in the highest degree ; and the selections from them in 1850 and 1853 have added greatly to the value of many private herds throughout the country, one of which we shall notice in order to illustrate our subject, and adhere to the golden maxim of “Science and Practice.” The herd to which we refer is that of Mr. Tanqueray, which we had the pleasure of examining the other day.

This herd consists of upwards of a hundred head of shorthorns, principally selected with great care from the best stocks of the kingdom. In proof of this, we may recall to our readers' recollection the fact that at the Tortworth sale this gentleman was the largest purchaser as to value ; although Mr. Greenfell, Beiks, exceeded him as to number. Ex Tortworth we may be permitted to individualize—Duke of Gloucester, Duchesses 55, 66, and 69, Oxfords 6, 11, and 16, Minstrel, and Mystery, as now forming part of this herd ; and that they have greatly enhanced its value need not be questioned. All have done well since they left Gloucestershire—the two youngsters, Duchess 69 and Oxford 16, extremely so ; holding out greater promises than they did when under the hammer of Mr. Strafford. The sum of 400 gs. for a five-months-old calf conveys to the mind ideas of a no-ordinary kind ; and to those of our readers who take a lively interest in the like, we may mention that at least one-half more money could now be had for this young member of the Duchess family—so remarkably well does she promise to develop all the good qualities of her ancestors.

To notice individually the herd in question, and how far each member of it illustrates the excellence of the breed, is far beyond our limits ; and, besides, the thing has long been held up by writers as “a crying sin,” although for what satisfactory reason they have hitherto failed to show. Our notions of statistical affairs, it is presumed, are fast undergoing a change ; and so we hope will prejudices relative to laying before the public reviews of private herds. Certainly, few things would be more edifying to farmers than a statistical account of all the shorthorns in the kingdom, and whereabouts they may be found. Less, however, will suffice for our purpose at present ; our object being to illustrate the value, improvement, and distribution of the breed generally by this as an example, it will be enough therefore to glance very briefly at heifers not in calf, heifers in calf, cows, and bulls of different ages, in all four classes.

1. The most prominent feature of the breed—that which gives it its greatest value—is early maturity ; and at no period is such exhibited to better advantage than in young heifers prior to the time they are of age for coition—such as the first of the above classes. Heifers of this age are house-fed, generally two in

a feeding box; and those of our readers who are not accustomed to examine and criticise our different breeds at this age may be at a loss to comprehend what is meant when we say, that on entering the different boxes we, though an entire stranger, met with a cordial welcome, expressed with a gentleness and affability which language cannot describe. But, although some breeders may not be familiar with such traits of character, yet they are the first—aye, and surest evidence that you are entering among improved shorthorns: characteristics which experience never fails to recognize. Those of them which were lying down immediately rose and fended with us; and you must keep handling and caressing them, too, all the while you are among them, or they will handle you after their own fashion, which is somewhat different from that of any other breed. If you lift your hand again, or show any signs of animation to keep them at a distance, they at once put a friendly construction upon it, expressing themselves, in their own way, as willing to dance with you as you with them. In short, there is no evil in their minds, so to speak; nor are they disposed to receive bad impressions. A surly, suspicious, and wild temper is as great a blemish as the breed can have, being hereditary, and subject to a thousand evils we need not mention. When young things are seldom handled they may appear a little shy on a stranger entering among them, standing at a respectable distance, as it were, for a time; but a placid and docile eye is easily known from a wild and surly one. And, moreover, whether you know the difference or not, the former will manifest all that child-like simplicity to form an acquaintance with you, so peculiar to this breed; while the sooner you are gone always appears the most satisfactory to the latter. Now the English of all this is simply *health and development of animal organism in the highest degree*—the greatest result from a given quantity of food. Young animals of this breed not only require less food, but less litter also, than those of other breeds, weights being equal. In other words, Mr. Tanqueray could not support an equal number and weight of any other breed upon his present keep. It is this which distinguishes the improved shorthorn from the unimproved; and at no period of life is it so conspicuously exemplified as when yearlings. The reason of this is, because the former manufactures more of its food into its own organism, while it voids less excrementitious matter, and rests and ruminates better in its feeding box. The latter not only consumes an extra quantity of food, but it works up that food into a less perfect organism, on which there is, consequently, a greater daily waste. Hence the larger quantity of urine and dung which it voids; while, from its restless disposition—the natural consequence, also, of an imperfect organism—it destroys no end of litter. On breeding farms, where there is generally no more straw than is required, one is sometimes apt to conclude that unimproved heifers of this age, when running loose, would consume the whole stackyard for litter, and, when done,

only exhibit, in a dirty and ill-conditioned skin, all the shapes imaginable but that of perfect symmetry. What was a promising calf when sucking its dam, is now, in nine cases out of ten, quite the reverse. Indeed, it is not safe to pass an opinion upon the unimproved breed at such an early period of life; for, by next year, they may even be worse, or greatly improved; while, by the time they are three-year-olds, they may be so filled up as to pass for comparatively good symmetry. When yearlings, certain parts appear to have overgrown others; but by three years old, the former overtakes the latter, as it were—but at a great expense of keep. The improved shorthorn, on the other hand, brings its symmetry along with it from the commencement, fulfilling at one year old all the promises it made when sucking its dam. There is a happy uniformity, so to speak, in the growth of parts, time and food being both economized in the highest degree. In short, at this early age, the farmer can see which should be pushed forward for the butcher, and which retained for the pail.

These are very important points in favour of shorthorns, and they are very faithfully illustrated by the yearling heifers of the Hendon herd. Generally, this juvenile class is very uniform, and promising as to quality. A few would require more green food, such as swedes, than what there unfortunately is to give them; but, generally speaking, little or no loss is sustained from a scanty supply. A large extent of the lands farmed only fell into Mr. Tanqueray's hands lately, in the worst state of order; and it is no easy matter procuring, from such, a sufficiency of turnips for so numerous a herd. The surprise is, that the young heifers exhibit the condition they are in. As to pedigree, they rank high, with a ready reference to Coates's "Herd Book;" while in the selection of bulls for the different cows, every attention had been paid, with the view of further improving the quality of the breed.

2. It has proved and over again been affirmed, that "our improved shorthorns are hot-house plants," unfit for the ordinary treatment and exposure which the generality of farmers have to give them. Now our second class of heifers at Hendon, those in-calf for the first time, exhibit a very satisfactory example in refutation of this objection, for they were grazing in a very exposed field, when we examined them, with only a so-and-so hovel to run into for shelter, and getting hay over night, and in very stormy weather, in the same manner as the so-called hardier breeds of the objectors do, and yet they were as fat and hearty as they should be—certainly, more so than the majority of our other breeds would have been. In point of fact, they were, if possible, the healthiest of the whole herd, and probably the most promising, for we have seldom seen a better lot, or one more deserving of recommendation to those interested in the like. We by no means wish to say, that certain circumstances and localities do not point to other improved breeds, as the Devon, Hereford, Galloway, &c., but when we come to these, we shall endeavour to do them justice; what we

wish to do at present, is to refute an objection brought against improved shorthorns by many who ought to breed and fatten them, but who do not, and the Hendon heifers in-calf do so in the most satisfactory manner.

3. The cow department of a breeding establishment is certainly not the least important. To call in question the prominent place which the improved shorthorn occupies here, or to say a word in favour of the breed, would be superfluous; at the same time, with all its advantages, it is not without its short-comings, and these, unfortunately, are what we have principally to deal with, our object being progress, or improvement. We are aware that there are two ways of going to work, breeding backward into perfection, and forward into perfection, the former being improving the breed, and the latter the formation of a new and distinct one, a hybrid; but new breeds from animal hybridization we must postpone for future consideration.

What are the short-comings peculiar to the shorthorn cow? We are here getting into the most dangerous and disputed ground imaginable, or into what we think may safely be termed an "un-reclaimed field." But be that as it may, we must not shrink from the difficulties and dangers of the pioneer, since those are admitted as incidental to our profession. It may not be unnecessary, however, to remind our readers of the indulgence which such a position demands.

It is said that shorthorn cows are more subject than other breeds to obesity, patchiness, or a defective state of the adipose tissue, plethora, scrofula, and their consequences—chronic or acute pleurisy and pneumonia, phthisis, and other pulmonary complaints, milk-fever, &c., &c.

The majority of these complaints are unfortunately hereditary, and it is possible that Hubback may have inherited the whole, for we believe it is generally admitted that he was tainted with obesity, and probably plethora and scrofula also, as they frequently go together. But granting such to be true, it by no means follows that the shorthorn is more subject to such complaints than the Devon and Hereford, or even so much, for the fact of earlier maturity being in favour of the former proves the greatest degree of health, as already shown, while facts corroborate this conclusion more forcibly. The last herd, for instance, which we ourselves managed before retiring from practice, was a Devon, where out of about twenty cows two were over fat, according to popular phraseology, for breeding; while out of fifty-one cows at Hendon, only two are in this condition, and these bought-in beasts, having no other connection with the herd than their being entered in "Coates's Herd Book." In this instance there cannot be a doubt, according to our judgment at least, but the cows in both cases (Devon and shorthorn) were afflicted with obesity, as in neither would it yield to starvation, while an extra degree of fatness merely will readily give way under a spare diet, without resulting in scrofula and consumption. In point of fact, such animals should not

be bred from, but sent to the shambles as soon as possible, however fine they may be in point of symmetry. And it may be added that we might very briefly dispose of the other maladies in the same manner. We do not say that there is not a certain class of shorthorns (the unimproved breed) which inherits the above complaints in a greater degree than the Devons and Herefords, but they ought not to be ranked among the improved breed, and as soon as anything of the kind manifests itself in individuals of the latter, however slight in degree, they should be forced forward to the shambles, if possible, and never bred from.

The careful selection of the Hendon herd already noticed was principally applicable to the cows, and therefore it may be said by way of objection that they are more than a fair example of the shorthorn breed, and that their freedom from the above complaints is entirely to be attributed to Mr. Tanqueray's judgment. There is, no doubt, much truth in this—indeed it would be useless to deny it in the face of his Tortworth purchase, already individualised; but such does not prove that the other herds of the kingdom, from which the remaining forty-five cows were purchased, were not as free from those complaints as his own; so that the objection against the breed falls to the ground. On the other hand, it is but fair to notice, for the sake of improved Devon herds, that the above stock referred to was also purchased by a party who was not cognisant of the complaints alluded to, so that the comparison has to be qualified—but of this afterwards, when we come to the Devon breed itself. The facts themselves if they prove anything, it is the importance and value of a careful selection of cows in both cases, for a breeding stock.

4. It has generally been thought more difficult to breed good bulls than good cows of any breed, and although early maturity is in favour of shorthorns, they are not an exception from this misfortune, if so it may be called. And after you get a good bull, both as to quality and symmetry, you are not certain of a good stock; while, on the other hand, you will frequently have excellent stock from a very inferior bull as to appearance. Bulls, therefore, ought to be judged by their stock. At the same time, there are some never-failing cardinal points, as it were, which serve as a pretty good index—such as *good temper, capacious chest* (in other words, good lungs) and a *fine handle*; in short, avoid all those *hereditary evils* already mentioned.

In the bull class of the Hendon herd, the Duke of Gloucester doubtless takes the lead, and has generally been considered more than an average example of the breed. At the same time, were we to criticise individually his bovine grace, we should not say more in his favour, perhaps, than was said at the Tortworth sale, if so much. There are ten others in his class, principally under the age of doing duty. The majority are very promising, while the merits of one or two must be determined by their stock. They may be the best stock-

getters in the lot, not excluding the Duke of Gloucester himself; but they do not look so at present.

In subsequent articles we shall notice the distribution of shorthorns, and the quantity and quality of their meat, &c., noticing at the same time how far some other herds of this breed support the above conclusions;* but, as we shall not have occasion to refer to the Hendon herd again for practical evidence, or, in other words, to join science and practice, save in common with other herds and breeds, we shall conclude our observations at present with a few words on a topic which is always uppermost in the minds of those interested in the improvement and distribution of this important breed, viz., "Does flesh hide faults?" "Is it a paying concern, or a puff?" &c., &c.

These questions have doubtless originated, and very justly so, at the exhibitions of the Royal Agricultural Society, where a serious sacrifice of the breed, as well as of time and food, is made for an empty title, preventing all but superior judges familiar with the like from being able to form a satisfactory opinion as to symmetry, and whether such a breed would answer them. When we

mention the fact that we could not have done justice to the breed, had we selected, as first proposed, such exhibitions for an example to illustrate our proposition, owing to the cases of obesity being proportionally so numerous, breeders of improved stock generally will appreciate our motives for selecting private herds, where excess of feeding is carefully avoided, in the one quoted, and where the herd, generally speaking, is under rather than above a fair breeding state of fatness; the maxim of "under than over-feeding," as practised at Tortworth, we believe, having been adopted. In short, cleanliness, order, regularity in feeding, economy, and utilitarianism, form the sum and substance of the whole code of management, everything being kept in its own place in the most exemplary manner. Less we could not have said on this head; more we shall not add, unless we are allowed to make honourable mention of the reception we ourselves experienced when at Decoy Farm. Our object being the peculiar claims of the short-horn breed at present, we hope impertinent criticism has been avoided in the illustration of our propositions. W. B.

POINTS BY WHICH LEAN CATTLE ARE TO BE JUDGED.

The first point to be ascertained is the purity of the breed of the animal whatever it may be, as by that point the propensity or degree of disposition to fatten is determined in the individuals of the special progeny. Several marks will show the purity of the breed; the colour is a good mark, when the colours are always definite. The bald skin around the eyes and nose is always unspotted and definite in animals of good organization. The horns, when present, are long or short, according to the breed; smooth and tapering; white throughout in some varieties, and tipped with black in others. The shape of the horn is not an essential point.

The form of the carcass is the next important consideration, and may probably be said to be the chief point of attention, and to outweigh the quality of the breed. Lean animals may be supposed to exist in a quarter to a half-fattened condition, and in that state the same properties of conformation may be seen as in the matured condition of fat. If the quantity of flesh that is present does not exhibit the necessary points, the bones must be nicely examined, if they are so connected as to afford the points in the future process of fattening. These points are the same as have been mentioned in the prime condition in our last article, and a very acute discernment is

required to discover the presence of these points in the lean condition of the beast. The judge must anticipate the realization of the points from the lean to the fattened condition.

The nature of the bone requires much attention; a round thick bone indicates a slow feeder, and also an inferior description of flesh. The opposite properties of a round bone are indicated by the flat bone, when seen on a side view, and narrow when viewed from behind or before the animal. As the bones are the walls of the animal habitation, and serve the purpose of carrying or supporting the flesh, the quantity must bear to the whole carcass the smallest possible ratio that is proper to the economy of structure. The texture of the bone should be small-grained and hard; the bones of the head fine and clean, and not carrying flesh to give the ox a heavy-headed and dull appearance. In order to endure travelling, the hock and forearm should be clean and muscular. Large joints indicate bad feeders. The neck of the ox is small from the back of the head to the middle of the neck, and contrary to the sheep in this respect.

The eye is a strong index of good breeding, or refinement in the organization, in being full, clear, and prominent; quick, but not fiery, and placid, along with a large expression, which indicates many properties in the ox, and is always attendant on fine bone. A dull heavy eye indicates a slow feeder; and a rolling eye, showing much white, is expressive of a restless, capricious disposition, which is incompatible with quiet feeding. A calm, complacent visage strongly indicates a fine and patient disposition, and, of course, kindly

* We have noted down the following herds for subsequent examination, should we be favoured with the permission of their owners:—Mr. Harvey Coombes's, Mr. Marjoribanks's, &c.—shorthorns; Lord Berwick's, &c.—Herefords; with equally favourable examples in the Devon and other breeds—following on with our flocks of southdowns, &c., afterwards; our object being the merit of breeds, and not individual herds, both for breeding and feeding purposes.

feeling. The eye most often tells the condition of health; a cheerful organ accompanies good health, while a constantly dull eye proves the probable existence of some internal lingering disease. But the latter property is quite different in character from a natural or constitutional, phlegmatic dulness.

Next must be ascertained the state of the skin. The "touch" is afforded by the skin, and the feeding properties of an ox are judged by that criterion beyond any other means that can be applied. The touch may be hard or mellow, fine or harsh, good or bad, as it is frequently termed. A slow feeder is marked by having a thick-set, hard, short hair, which constitutes a bad touch; a thin, meagre, papery skin, covered with thin silky hair, though the opposite to the one just mentioned, does not constitute a good touch, but is indicative of weakness of constitution, though probably of good feeding properties. A good touch will be found in a thick loose skin, floating as it were on a layer of soft fat, yielding to the least pressure, and springing back towards the fingers like a piece of soft, thick, chamois leather, and covered with thick, glossy, soft hair: the hair looks rich and beautiful, and seems warm and comfortable to the animal. A curly pile of the hair indicates a vigour of constitution, and also a propensity to fatten: such a skin is termed gelatinous and resilient in the fashionable language of the day, and mossy, from resembling a bed of fine soft moss. The sensation of a fine touch is very gratifying to every judge and amateur of breeding: the animal is liked, and more especially as it is mostly accompanied by a symmetrical form. Long practice is required to appreciate a fine touch; but when it is acquired, it is alone sufficient to estimate the feeding properties of an ox, as a general refinement of organization accompanies it, in purity of blood, gentle disposition, fine bone, and the other properties of symmetrical form.

The terms that are used in the science and practice of breeding, as blood, breed, pedigree, and descent, are all contained in the one designation of a refined organism, which comprehends a general refinement in every part, in the proportion which the extremities bear to the body, and to one another. Of all parts of the frame the head is the most difficult of the proper refinement, and it accordingly denotes in no small degree the state of purity in which the animal exists as to the special excellence. The head must be small in comparison with the body, and neat and clean. The face must be long from the eyes to the point of the nose, which most essentially constitutes the handsome appearance. The skull must be broad between the eyes, and taper very considerably and regularly to the nose. The muzzle is fine and small, and nostrils capacious. The skull contracts little above the eyes, the crown of the head is flat and strong, and the horns protrude horizontally from each side, and afterwards assume the medium direction between the rectangle. The curvature should scarcely reach the vertical line from the root of the horn; and if the point does reach it, the further progress is not al-

lowed. The horn is short, rather thin, and thickening to the root, which is a mark of vigour and functional strength. The ears should be large and somewhat erect, tapering in the form, agile in motion, and silky in the hair. The neck must be of medium length, short rather than long, which marks a strong propensity to fatten, and is attended with a full neck vein. It must join the shoulder with a very gradual slope, and taper to the head, having little or no rise from the top of the shoulder to the root of the horns, to destroy the straight line along the back to the plumb line of the buttocks, over the set of the tail. A droop of the neck from the top of the shoulder to the head indicates a weakness of constitution, and too close affinity in breeding. The legs below the knee should be rather short than long, and clean made. They should stand wide apart, and placed to support the body very easily. The tail shows a refined organization, and also a debilitated constitution from too near affinities. In the pig, these two properties are soon apparent. In cattle it should be clean, of long hair, of medium thickness, and furnished at the end with a handsome brush or tuft of strong bristles.

The chest of the ox must be wide, in order to afford ample room to the action of the flux and reflux of life. A slightly truncated cone is the best representation of the chest—wide below, and tapering to a round top of the shoulder, which should be covered with flesh. The shoulder bone must slope into and join the fore ribs, so as to prevent any vacancy in the fore-girth, and the arch of the ribs from the backbone terminates in the under-centre of the belly, so as to make a straight line with the shoulder. The short ribs must join close to the hook bone, and not leave a deep hollow gap; the hook bones are wide apart, in order to give the utmost expansion: buttocks broad, deep, and straight; twist wide; set of the tail low, and the hanging of it perpendicular, without any bends.

The length of the tail reaches the heels. The flank of the animal, or fleshy ligature which joins the lower belly with the hip, must be large, full, and prominent, being much required to continue over the thigh, to the plumb line of the buttock from the root of the tail, the straight line from the shoulder along the extreme ribs of the animal, which constitutes the side of the parallelogram, which figure a fattened carcase is expected to represent. The belly must not hang down in a loose dependence, but be easily carried by a straight line from betwixt the fore legs to the twist and outside the hams. On the other hand, the entrails must not be too much curtailed, to destroy the vigour of function that is so essentially necessary to the prosperity of animal life.

The joints must be flat and broad on the legs of animals; bones round on the top of the shoulder, hooks, and fore legs; clean and thin in the hind legs, and of the chaps; flat in the shoulders and thighs, and low along the back, ending in the extremity of the tail. The hoofs must be clean and neatly fashioned, short and

well rounded, bright in colour, and not covered with any hair. The extent of foot must be proportional to the carcase to be carried, but always small rather than large.

All improved breeding has proceeded from the casual productions of nature which are seen to possess the properties that constitute value, and also a capability of transmitting the qualities to their progeny. The rules and considerations that have been now detailed may be impossible of application in the whole number, but a major part of them will constitute a direction of judgment for practical use. The chief difficulty occurs in the case of the lean ox, as the condition of the fattened animal very often conceals the deformities of shape, and may even produce in itself some symmetrical objections. The judge examines the points of value in the flesh, both in quantity and quality, estimates the weight, and fixes the probable value. But, in judging of a lean ox, its future symmetry and condition must be foreseen: the rules, if studied practically, will enable an inquiring observer to foresee these points, and in judging between a

number of valuable points, it should ever be remembered that purity of breeding will always insure aptitude to fatten, which in its turn will insure the largest remuneration for the food consumed.

In judging fat animals the touch is the chief criterion—at least, the confirming test. In lean beasts the eye must distinguish the points of excellence, assisted by the touch, as to the skin, and position of the ribs, and joining of the bones. But it has much the widest range in the case of lean animals, and the judgment is also more largely called into action in estimating the distant possession of excellence, than in calculating the comparative and absolute value of the existing productions. The one case exists in substance, the other only in idea: the first is a certainty, the last a visible probability. Both cases require an acute discernment, a correct observation, a well-stored memory, and a most calculating judgment. Such a rare combination of qualities accounts for the very small number of really good judges that are found. J. D.

ADULTERATION OF LINSEED OIL-CAKE; SUGGESTIONS FOR THE USE OF BRAN WITH RAPE-CAKE.

SIR,—I am a consumer of linseed oilcake, and, in common with my brother-farmers, complain of its extensive adulteration with bran or other offal. My object in addressing you is to call attention to an adulteration of cattle-food, of extensive use, which is inflicting a serious injury on the producers of beef and mutton, and compelling them to pay £10 or £11 per ton for an article which is only worth £6 in the market.

I willingly admit that the admixture of bran with oilcake may be useful to assist adhesion; and I consider it no less useful in reducing its hardness, and rendering mastication less difficult. But the extent to which adulteration of this kind is now carried on demands attention, because the feeding properties of bran cannot be compared to those of linseed. Many stall graziers are at this moment disappointed. "Their feeding cows and bullocks don't grow as they ought to do." "Though the price of beef has advanced in the markets, grazing is a bad trade." "Cake is dear; and it does not pay." Perhaps the great reason and cause of these complaints may be found in the adulteration alluded to. Stall-feeding cattle are eating *too much* bran, and *too little* linseed.

Should any indignant crusher knit his brows, and repel these remarks as unnecessary and uncalled for, I beg, by way of *amende honorable*, to suggest that, instead of mixing bran so largely with linseed cake, they use it largely and unsparingly with rape-cake. In this case, there would be no adulteration, because the price of bran is generally about the same as rape-cake.

I, for one, should be very much indebted to any seed

crusher who would introduce into the markets a cake made of half rape and half bran. Rape-cake would then cease to be applied as an article of manure. It would become, as it ought to be, an extensively-used article of cattle-food, and reduce in some degree the great demand for linseed-cake; and it would become, in my opinion, a better and richer manure after the natural digestive preparation.

My attention was first called to the use of rape cake as an article of cattle-food (particularly for sheep) by Mr. Pusey, M.P., in the *Journal* of the Royal Agricultural Society of England; and I have continued to use it ever since. In a letter received a few days ago from that gentleman, he states that he is giving his tugs "a quarter of a pound per day of rape-cake."

I am not going to enter into a disquisition as to the comparative nutritious or feeding properties of linseed-cake *versus* rape-cake. I only know that bran will not increase it in linseed-cake, but it would be a valuable addition to rape-cake. It would increase its general usefulness, it would give it increased bulk, and it would reduce the bitterness of its taste. Should these suggestions be adopted by the crushers, or be the means of drawing the attention of the agricultural public to this new manufacture of cattle food, this complaint may be of some service.

I am, sir, your obedient servant,

J. JEPHSON ROWLEY.

Routhorne, near Chesterfield,

Jan. 7th, 1851.

ON THE IMPROVEMENT OF FARM HORSES.

SIR,—To a certain degree there requires an assimilation between the character of every description of horse. In other words, if we would improve the inferior breeds of horses, it is necessary to give them a certain amount of resemblance in particular points to the higher. This process has, in fact, long been at work with the hunter, the hackney, and the carriage horse. In the last century the first was a quiet-looking animal, well proportioned as to strength, but giving little more promise of speed than the cob which at present carries an elderly gentleman his daily airing; the hackney was, if possible, still stouter, and even less fleet; while the carriage horse was a gigantic animal from 16 to 17 hands high, long on the leg, with enormous crest, high fore hand, upright shoulders, long head, and Roman nose. Such were the horses which dragged the "family coaches" of our ancestors, at a rate of from five to seven miles an hour. How are all these matters changed! The hunter of the present day is seven-eighths bred, if not entirely thoroughbred; he is expected to race across the country after hounds equally high-bred, and whose fleetness has been increased in an equal ratio. The hackney, too, has been crossed with blood (not always judiciously), and is often as speedy as the hunter, though less powerful. While as to the antique "coach horse"—that gaunt animal, with his red legs, is now scarcely to be met with in his pristine purity. His legs have been shortened, and turned from bay to black; his crest is lowered; his head has been lessened in more directions than one; while evident crosses of blood, which he shows, have imparted to him a decidedly more modern and aristocratic appearance. His frame is deeper, his body shorter; he can get his hind legs under him; and as to his pace, twelve miles an hour are easier to him than eight would have been to his venerable maternal ancestors. Such are the beneficial effects of blood—that is, of a superior race judiciously engrafted on an inferior.

As to the lower class of cart-horses, weak, slow, and sluggish, they are past improvement: they want utterly abolishing. They present a combination of every fault, without one useful quality; unless, indeed, their extraordinary faculty for standing still may be regarded as one. This they will certainly do, as long as ever it pleases the cartier to remain in the ale-house. The difficulty is to get them to move, and still more to keep them in motion. For my own part, I prefer a team which keeps my man somewhat more on the alert. In the midland counties, however, there exists among agriculturists an antipathy to blood, of which it is time they were cured. Most farmers regard it as something the antipodes of power—something antagonistic to work and usefulness. Nor is the idea confined to farmers; on the contrary, it is common among all persons, except those who know

what thoroughbred horses really are. The assertion that a dash of blood would be eminently conducive to the improvement of farm horses, will, I am aware, be far from meeting with general concurrence. And yet, let any one who is sceptical as to its soundness, look at the teams on the Yorkshire Wolds. His wonder at the weights which four horses draw in the excellent poled waggons of that district, will not be less than his surprise at the pace at which they move them. Even on the best-farmed strong-land districts of that county, the character of the horses is similar, although the individuals may be selected somewhat less for quickness and more for massive strength. There the working horse is seen in perfection—a combination of strength, quickness, size, and endurance. A pair of such animals, kept as they are, and as all farm horses ought to be, would drag six of the under-bred slugs of the midland counties before them. In that county, more than a pair at plough is a rare sight indeed, even on strong land; whereas, in the midland districts, three, four, five, and even six horses may be seen in the plough, the harrow, or the drill, dragging "their slow length along." Yet this lengthy team, in spite of the "driver," and the liberal application of his whip, does not accomplish anything like the average day's work of the Yorkshire pair. Would that farmers travelled! would that, like the members of other professions, they visited other districts, with the view of scrutinizing the practices prevailing there, and imparting improvements into their own! For no instruction is so valuable to a man as the facts which he sees with his own eyes. On the subject of horses I have talked to my neighbours till I am tired: they either only half believe in the existence of any other practice than their own; or, if they give a passive acquiescence, they content themselves with thinking that there must be something peculiar in Yorkshire, whether in the air, or the climate, or the land; but always revert to the conclusion, "It won't do here." The English of this is—that as it would give them some trouble to try the new plan, therefore, right or wrong, they mean to stick to the old one.

I do not maintain that it is possible to plough all land at every season with a pair of horses: he who makes any such assertion is ignorant indeed of practical farming. But I do say that there are thousands of acres now worked by a weak team of five or six indifferent horses, which a pair of really good ones yoked abreast would work both more efficiently and more quickly. It is done in Yorkshire, Lincolnshire, and the Lothians: where then is the difficulty of doing the same on the lighter parts of Derbyshire, Staffordshire, or Warwickshire? In the first place we must have better horses; and, secondly, our labourers must become ploughmen, and learn to dispense with the driver. In a recent leader you have

called the attention of your readers to the practicability of diminishing the number of horses on a farm. My firm conviction is, that in our part of the kingdom, this might be done to the extent of from one-fourth to one-third, not only without detriment to the work, but actually with benefit to it. Nor is this mere theory. When my father lived at Foston Hall, in Derbyshire, he held a farm of upwards of 300 acres, which he worked with a team never permanently exceeding eight. Besides the ordinary work of the farm, there was not only a great deal of coal-leaving from a distance, but much of that miscellaneous work which a gentleman's establishment entails. My father had been told that it was impossible to plough with a pair—that the Scotch bailiff of a former-tenant had made the attempt, and had been obliged to abandon it. This impossibility, however, he continued to perform for seven years, keeping the land during the same time in a high state of cultivation. No farm in the neighbourhood was worked with so small a proportionate number of horses. But, then, they were good ones, and well kept. And this is the only true policy for those agriculturists to follow who desire to keep up with the times. Let them keep few horses; but let them be efficient, and in real working order. I agree, too, with Mr. Mechi about keeping their coats short. No horse intended for severe work ought now-a-days to have a long coat. Let farmers try the experiment; and they will be surprised at the ease with which a clipped horse accomplishes a long stage on the road, compared with another rendered faint and weak by a long coat dripping with sweat.

The horses commonly employed by the farmers of the midland counties are of a wrong sort for the work they have to do. That good individuals may occasionally be met with, I do not deny; but even these are more adapted for the dray than the plough. In the streets of Burton, noble-looking animals may be seen drawing loads which, to the uninitiated, it would appear impossible for them to move. To do this, and with ease too, is doubtless an excellence after its kind; but it is quite another merit from that which the farmer requires. He does not often call upon his horses to drag enormous weights; what he wants are animals able to step quickly with a moderate weight behind them, and to keep up an even pace for several hours consecutively without more fatigue than a hearty feed and a night's rest will suffice to recruit. Unfortunately, it has long been the nearly universal practice of these districts to breed cart colts with an eye to selling the largest and best of them for dray-horses. For this purpose mere weight is the chief desideratum; the weight of the horse is to overcome the weight of the load. Even fat, which in all other cases is a hindrance, may here be an aid, so slow is the pace, and so short in general the distance to be traversed. Take a pair of these monster horses from the streets of London or of Burton, and transfer them to the plough, and they would cut but a sorry figure after a week's work under the guidance of a Yorkshire plough-

man. Such animals have been bred for mere size and weight; muscle, and the symmetry which conduces to ease of movement, and the constitution which overcomes fatigue, being no objects here, are points which have neither been sought for nor attained. The very contrary of all this is required in the farm-horse; overgrown size and misplaced weight, so far from assisting his work, make it difficult, if not impossible to him, to perform it properly. Although not wanted to go any great pace, yet a horse which is required on occasions to accomplish his acre per diem with a plough behind him, and walking over a rough fallow, ought (in order that such a task may not distress him) to possess the muscle and the form which will enable him, as far as pace is concerned, to move considerably quicker than this. For a horse to be *within his speed* is an advantage, in all kinds of work, which can hardly be overrated. In order to attain this, two conditions are requisite, neither of which our cart-horses can boast: 1st, The requisite anatomical formation; and, 2ndly, a sufficient infusion of blood. There must be a deeper chest, more width through the heart, the back-ribs must be wider, and the muscles of the loins stronger than in the ordinary farm-horse. The fore-legs must give token of a quality of bone less porous and more weighty; the integuments must be thinner and tighter, while the hair ought to be less superabundant. Their form, too, must be corrected; instead of bending, as it were, backwards, with the knee forming the centre of a concave arc, the legs should either be straight or the knee may stand slightly forwards, thus greatly strengthening the fetlocks. The feet, too, must be cured of their thinness and flatness.

Such are some of the improvements which a judicious infusion of higher blood will gradually bring about. Still more valuable, perhaps, will be the quickness, the energy, and the strength of constitutions which it will impart. The dray-horse and the thorough-bred horse stand at the two extremes of the equine tribe; remove the former from his own sphere, and he is useless. A pariah himself, he is unable to fulfil functions nobler than his own. The very reverse of this is the case with the horse of pure blood. Take the racer out of training, and he makes the best of hunters and the noblest of chargers; no horse is superior to him in the drag or the phaeton; and when grown too old for gay callings like these, he will work in the team as steadily as any Dobbin which has done nothing else all his life. This versatility of usefulness it is, which stamps the thorough-bred horse as the universal improver of his race. If few persons are aware of this fact, it is because only a few are intimate with the thorough-bred horse in his noblest forms. The longer he is studied, the more thoroughly he is known, the higher will be the admiration with which he is regarded. And it does require long familiarity with the various properties for which his several families are distinguished, to be able to handle them to the best advantage in the improvement of other varieties; accordingly it will be found that wherever the thorough-bred horse is most known and best understood by the people, there all other varieties exist in the highest perfection. Every Yorkshireman has sympathised with the triumphs

of Beeswing, of Van Tromp, and of Nancy, and I felt them almost as his own. What county vies with Yorkshire in its hunters, its carriage-horses, and its roadsters? And if its farm horses are, as I think them, rather bad to beat, there can be no doubt but that it owes their excellence to the same cause. Let me not be misunderstood: I do not recommend the farmer to put a wa-hy, gummy-legged cart-mare to a thorough-bred weed; the result would not be a farm-horse, but something probably even more worthless than his parents. I am not writing a treatise on breeding, but only endeavouring to direct the thoughts of breeders into the only channel likely to lead to success. I therefore close this letter by once more recommending to them the sedulous study of the thorough-bred horse.

The further development of this subject I must defer till my next.

I am, your obedient servant,
WILLOUGHBY WOOD.

Sir,—In following out the line of argument begun in my last letter, I shall strengthen my position by a passing reference to other domestic animals. We find in practice that every breed of cattle is improved by a cross with the short-horns, the most perfect of them all; and I believe there are few varieties of which the breeders do not at the present day more or less resort to this cross. In like manner, with regard to sheep, what breed is there which either is not or has not been crossed with the Leicester or the Southdown? Indeed, this is one reason for the high prices which rams of these two aristocratic breeds continue to command. In all these cases it will be found that it is the superior race which assimilates the inferior to itself, and tends as it were to swallow them up. Many varieties of cattle and of sheep once well known in this country are now either forgotten or are remembered only by name; and yet here the process is retarded by a cause which, so far from applying to the case of the horse, there operates in the contrary direction. There can be no doubt, as regards sheep for instance, that, compared with the Merinos and the black-faced Scotch, the Leicesters and the improved Southdowns are but breeds of yesterday. And accordingly there is a very strong impression that, however well the first cross between a Scotch ewe and a Leicester ram may succeed, to cross the produce again with the Leicester would not answer. How this may be, my experience is not sufficiently extensive to enable me to decide. If the idea is well founded, it is, at any rate, in accordance with the theory of M. Malingié Nouel, who conceives the influence of either race to be in proportion to its antiquity and purity.

With regard to short-horns, as far as the opportunity which surrounds their origin permits us to judge, I am inclined to think that they have existed as a breed for a considerably longer time than our improved breeds of sheep. Further back than about 100 years, authentic details of the ancestors of the short-horns are few and scanty. But, according to the Rev. H. Berry, a race of cattle existed at that time, on the borders of the Tees, similar in all essential points to those of which the pe-

degrees have since been recorded in the "Herd Book." As some of the earliest animals of which we possess authentic record have probably been among the best short-horns that ever existed, it is by no means likely that they should suddenly have sprung to the perfection which, in judicious hands, they have ever since maintained—in a few years, or even generations. This uniformity of excellence is scarcely applicable on any other supposition than that of very considerable antiquity belonging to the breed. We know, too, that when an ordinary cow is put to a good thorough-bred bull, the offspring usually resembles the sire more than the dam. We also find that on the cross being pursued for successive generations, the offspring, so far from showing tokens of degeneracy, is in time scarcely, if at all, to be distinguished from these of the purest blood. But although these facts indicate a more than respectable degree of antiquity for the short-horns, they, in common with all other domestic races, must by a long interval yield the palm of antiquity to the thorough-bred horse. Compared to him, they are indeed of yesterday. The oldest of them are but moderns in the presence of his Arab sires, contemporaries of the Prophets and the Patriarchs! No one who reads Job's sublime description of the war-horse can mistake the race to which it applies, or deny that it is as suitable to the thorough-bred charger, which bears our heroes to victory, as it was a living portrait of his Arab ancestor 3,000 years ago. Allusion has been made in some quarters to a supposed degeneracy in the thorough-bred horse. My firm belief is the reverse. Our modern horse is a great improvement on the small, low-shouldered, though stout Arabs from which he is descended. I am confident that never were there better thorough-bred horses in existence than those which have adorned the turf for the last twenty years, and which still continue to compete for our great prizes. He who thinks otherwise had best be silent, since to express his opinion would only be to expose his ignorance.

To know the thorough-bred horse well and thoroughly is not only invaluable to the breeder, but indispensable to him, if he wishes his success to rise above mediocrity. This is the lesson, and a very long one it is in practice, which the farmers of the midland counties have to learn. At the outset they must dismiss the prejudices which represent him as a slight, weedy animal; useless when away from the turf, except as a cover hack or a lady's pad. It is sheer delusion to suppose that blood is necessarily opposed to power. Doubtless there are weeds among thorough-bred horses—bad samples of a noble race. But are there not abundance of feeble animals of any other breed, from the hunter down to the cart-horse? He who wishes to form a sound opinion as to the value of any breed must look at the characteristics of the best individuals before he is competent to decide upon its merits. It is a fact well worthy the attention of breeders, that a considerable proportion of the most successful racers have been horses of great power. I should weary your readers were I to enumerate them all; but, in order to show that the highest blood and the greatest swiftness are not incompatible with a degree of strength and

substance which would fit its paces or for any purpose (except the dray) to which the horse is ever put, I will mention four examples in support of my argument—viz., Melbourne, Lanercost, Sir Tatten Sykes, and Van Tromp. The first is the sire of an Oaks winner, two Derby winners, and two St. Leger winners. Lanercost is the sire of a Leger winner, and an Oaks winner. Van Tromp, his son, won the Champagne Stakes, the St. Leger, and the Emperor's Vase. Sir Tatten Sykes won the St. Leger. Here, then, are four horses of first-rate reputation, the two first as sires of winners, and the two last as winners themselves; any one of which would, as a hunter, have been strong enough to carry fifteen stone a cross the country. To those who know what hunting is, such a character offers more explicit evidence as to power than any other description. Animals like these, though too valuable to be put—save in exceptional cases—to any but thorough-bred mares, would out of working mares produce the best of cart-horses. In fact, I know two horses belonging to a neighbour of mine—out of an excellent working mare, and got by Melbourne—which it would be difficult to surpass in every point which a working horse ought to possess. One of the most powerful horses in a team that I ever had was by a son of Langar. It may be said that such instances do not often occur. In one sense they certainly do not; for, unfortunately, good working mares are not often put to first-rate thorough-bred horses. But, if they were, the produce would probably exhibit as great a uniformity of excellence as the breeder often attains. My object in the foregoing remarks has been to show the uninitiated in such matters what the thorough-bred horse in perfection really is. Let every one who has the opportunity of seeing the winner of any of our great races take advantage of it, if he wishes to look on a combination of symmetry, power, and beauty, of which the animal kingdom affords no other example. It is possible, indeed, that the beginner, who looks for the first time at such a horse, may be disappointed, and think him unworthy of his fame: let him be assured that the deficiency is not with the horse, but in his own unpractised perception. He has his lesson before him—let him study it diligently; and if he has an eye to appreciate, and a memory to retain forms, he will in future reap the benefit.

I have thus, I trust, shown that the thorough-bred horse possesses every requisite for improving the existing breed of working horses. In many points he is so palpably their superior, that to state them is proof sufficient. In speed, in courage, in endurance, they stand at the two extremes of the equine scale. The muscle of the thorough-bred horse, the development of his chest, the width and strength of his loins, and the general conformation of his frame, would be notable improvements upon the deficiencies of the cart-horse in these points. And even in respect of size (as I have already shown) of bone, weight, and substance—those points where the racer is popularly held to be deficient—a judiciously selected thorough-bred horse would not cause any deterioration.

As a general practice, however, I am opposed to the

crossing of races of widely different character. The common run of cart mares is not sufficiently good to render it safe to put them to a thorough-bred horse; indeed, I seldom see a working mare in the midland counties that I should like to breed from at all. The object to be aimed at is gradually to infuse a certain amount of blood, both into mares and stallions, and thus to obtain an improved race, characterised by greater quickness, activity, courage, and in shape by more compactness; or, in other words, by equal strength compressed into a smaller compass. I can recommend no better plan to the farmer than to purchase mares from Yorkshire, whenever his team needs recruiting. By so doing, and by never replacing the heavy blacks of our own neighbourhood, the latter would in time pass away, as has already been the case with the long-horned cows, which in my earlier days used to abound in our dairies. The farmer would not find the noble, quick-stepping, bay and brown mares of Yorkshire more expensive to buy than their own long-haired slugs; and in them he would have animals worth breeding from. Their produce would remunerate him, whether it were by a horse of a similar character to their own, by a roadster, or by a thorough-bred horse.

In Mr. Stephens's "Back of the Farm" there is a representation of a cart horse (vol. iii, p. 712), of which that experienced writer says—"The form is, in his estimation, the very perfection of what a farm horse should be." In this opinion I quite coincide with him; and therefore recommend the print, and its accompanying description, to the careful study of every farmer who is interested in this subject. The breeding of this horse is said to have been "Clydesdale, with a dash of coaching blood in him." However successful such a cross may have proved in this instance, I am not in general partial to the coaching blood for farm horses, especially for those which have to work on strong land. Coach horses being required as much for show as for hard work, are apt to present an unnecessary length of back—a point much detracting from that compactness and strength so essential in the farm horse. Mr. Youatt was quite right when he said there was a great deal of deception about even the improved coach-horses, "and that a pair of poor post-horses would, at the end of the second day, beat them hollow." The secret of the endurance of the posters is in their blood; they would probably be under-sized or blemished hunters, or unsuccessful or aged racers. It cannot be too strongly impressed upon all who desire to possess first-rate horses, that show, so far from being essential to excellence, is not seldom antagonistic to it. The farmer, more than all men, ought to hold this in remembrance. The animal which by the inexperienced is termed "a fine horse," is frequently fit for no earthly purpose. Let the farmer look for compactness above all things, for strength evenly distributed, well-developed muscles, and wide-spread loins. These points, combined with a quicker temperament, will impart to the working horse that which he so much requires—a greater amount of motive power, and more facility in using it. Large limbs, though good in themselves, are useless without a frame and muscular development in proportion. In these points is the nearly universal failing of our working horses. In proportion as they are corrected will our teams be increased in efficiency, while they will at the same time admit of being reduced in number.

I am, sir, your obedient servant,
WILLOUGHBY WOOD.

THE BIRMINGHAM SOCIETY, AND PREMIUMS FOR HORSES.

SIR,—Will you permit me to say a few words in reply to the remarks of Mr. Wright, at the Birmingham dinner, in reference to the premiums for horses at the forthcoming show. While I cannot but be gratified in the manner in which he alludes to my letters to this journal, as well as at the virtual concession which he makes to the soundness of the principle for which I have contended, I cannot help thinking, at the same time, that his own arguments lend additional weight to my view of the question; for when Mr. Wright says that the owners of the Flying Dutchman and of West Australian are careless of such honours as the first place in the Birmingham Showyard could confer, it does appear to me a somewhat singular inference that, *ergo*, those honours ought to be rated as low as possible, and the emoluments reduced in proportion. The argument evidently points the other way. If you were anxious to secure a guest at your table, whom you did not think likely to accept your invitation, would you stand the best chance of ensuring his presence by promising him turtle and venison, or cold mutton and potatoes, on his arrival? It is possible, indeed, that the one might not tempt him, but the other would certainly repel him. So with horses: conceding that large prizes might not attract the best into your showyards, it is certain that small ones will tempt none but the worst.

But if there is any fact of which I feel more certain than another, it is this—namely, that any society which steadily offers handsome prizes year after year for thorough-bred horses, will, sooner or later, attract the best stallions for getting hunters which the kingdom can produce, provided judges are appointed in whom the exhibitors have confidence.

With regard to the particular horses to which Mr. Wright referred, it must be recollected that peculiar circumstances frequently confer an adventitious celebrity on a racehorse, independent of his real and intrinsic merits. Such a horse is said to be “fashionable;” and while such is the case, his services will, of course, not be within the reach of ordinary mares. The name of the Dutchman is familiar to many persons who are unacquainted with any other race-horse, owing to the celebrity which he acquired from his great match with Voltigeur. In like manner, West Australian, having won the Derby and the St. Leger, is now invested with a well-merited fame. It is with no wish to detract from their reputation, however, that I say there are many stallions whose performances, without having been so brilliant as these, are no less calculated to get hunters of the first class. Where are they? What are their names? These are questions I do not feel called upon to answer. It is you, the great agricultural societies, who must summon them to your yards, and hold them up to the attention and the admiration of breeders. To prove the importance of doing so, let me relate an anecdote.

A friend of mine, who has been a foxhunter for many years, and who is a good judge of a hunter when in condition and ready for work, had, some time ago, a mare from which he was desirous of breeding. He consequently rode over to inspect two stallions, both standing at one stable in this county, and which at that time covered half-bred mares at farmers' prices. After a leisurely examination, he came to the conclusion that neither of these animals would answer his purpose of begetting a colt likely for hunting. One of them, to use his own words, was so heavy as to be only fit to get omnibus-horses; while the other was as much too light. Mr. Editor, would you believe that the two horses which my friend thus complacently condemned have since actually been proved to be two of the first stallions in the world, the omnibus-horse being Melbourne, while the other was Orlando!

Does not this instance prove (and similar ones are of daily occurrence) that breeders require a competent guide to aid them to discover good stallions? Here are or were two horses fully equal as sires to any which the world can produce (and therefore superior to the untried horses named by Mr. Wright), which would readily have been sent to any agricultural meeting where prizes of sufficient importance were offered. For, let it be remembered, that “fashion,” which is of great importance to the breeders of racing stock, is of little or no consequence to those whose object it is to rear first-rate hunters, carriage-horses, or hacks. What they want is power and symmetry, in combination with good blood, which has proved its stoutness by success on the turf. And I assert—without fear of contradiction from any one who has adequate experience of this subject—that the stallions are few in number of which the services may not be secured at a reasonable rate during some portion of their lives, either before they have achieved fame by the celebrity of their progeny, or after they have been thrown into the shade by younger or more fashionable competitors. Instances without end I could adduce in support of this view; but, as I shall have to address you shortly again on the subject of stallions, I forbear for the present. One word more as to premiums. In former articles, while pointing out the strange niggardliness of agricultural societies to the higher classes of horses, I have assumed that it was rather the effect of necessity than choice; and I have therefore suggested palliatives, rather than what I regarded as just and desirable. Let me now state what I think any society ought to do, whose funds can afford it, and which is really desirous of benefiting the breed of horses in this country. Let it give £50 for the best stallion for hunters, with second and third prizes in proportion; the judges being authorised to withhold any of them on the ground of want of merit. Such is my idea; whenever it is carried out, Mr. Wright will have an opportunity of becoming convinced that it is not want of competition which causes

small prizes, but small prizes which discourage competition.

It had escaped my notice at the time I last commented on the Birmingham prize-list, that it was there stipulated that the stallions were not to exceed seven years old. I trust that this condition will be reconsidered. "Cecil" says that, "both with mares and stallions, their best foals have often not come forth till they were advanced in years; this, however, more generally applies to stallions than to mares." Orville was fourteen years old when he begot Ebor (winner of the St. Leger), and twenty years old when he was the sire of the still greater Emilius, in his turn the sire of Priam, the successives of whose descendants continue unabated to the present day. Slane, at fifteen, was the sire of Little David, winner of the Cambridgeshire; while Melbourne, at sixteen or seventeen—not having the Stud Book at hand, I cannot be correct to a year—was the sire of West Australian and Meteora, his stock having proved themselves more successful last year than in any previous season. I might multiply instances until I wearied your readers to prove what is well known to every breeder for the turf, that the best horses are those which are begotten by a sire certainly above seven years old, the age of the Birmingham prize-list—I might say above ten years old. If it is considered how severe is the work which a racer goes through, it will not be surprising that he requires two or three years to recruit himself. Few horses retire from the turf until four, many not till two or three years after that age. Charles the Twelfth won the Goodwood Cup at five and six years old; Goldfinder won the Chester Cup, and Teddington the Doncaster Cup, when they were respectively five years old. Touchstone and Lanercost won the Ascot Cup each at six years old. These animals, having undergone in their contests for victory the severest trial which the frame of the horse is capable of standing, cannot acquire the form of a stud horse on a sudden, nor without time. They may indeed be virtually uninjured by the ordeal which ruins so many of their competitors; but it may, and frequently does, require years of repose to give them the lordly port befitting the monarch of the stud. Such being the case, it certainly must be pronounced an injudicious measure to require stallions to present themselves for competition, at an age when there is a probability that neither in appearance nor in reality have they arrived at perfection. You thus not only limit the choice of breeders, but you incur the risk of excluding many of the most desirable stallions in the country. Had I a voice in the matter, I should exert my influence in the opposite direction, and vote for no prize except a probationary one being given to untried horses. All the first authorities in breeding are agreed that it is impossible to predict beforehand how the stock of any horse will turn out. Elis was a good horse on the turf, his blood was undeniable, and his appearance everything that was promising; yet, as far as I recollect, none of his stock rose above mediocrity. Some years since a horse was offered to me as a stallion which had run well, had abundance of substance, was well made, and appeared altogether well calculated to be a sire for hunters.

This horse had won the first premium at one of our principal agricultural societies; beating, among other competitors, a Leger winner. Here to all appearance was a highly-desirable horse; but on inquiring of a friend the character of his stock, I learned that they were small, weedy, and unpromising. I had subsequently an opportunity of seeing a colt by him out of a good mare, and a more miserable creature I never beheld. Here, then, was an instance in which the influence of an agricultural society had tended, as far as it went, to mislead breeders. Give probationary prizes by all means to horses from four till six years old; but always let your first prizes have more or less reference to the character of the stock of the competitors. As to the age beyond which it is inexpedient to confer such a distinction, that may safely be left to the discretion of the judges.

There is one more point to which attention ought to be directed in reference to this subject, which is, that there is a presumption that when the age of the male parent exceeds that of the female, the proportion of male offspring will be in excess, and *vice versa*. I refer those who wish to see more on this subject to Mr. Milburn's interesting little work on "The Cow," page 56. It is sufficient to say here, that no chance ought to be thrown away of securing an object so important as a preponderance of colts over fillies.

If by these few hints I shall succeed in inducing the Council of the Birmingham Society to rescind the condition as to age, I believe that I shall have conferred no small benefit upon the breeders of the midland counties.

I am, your obedient servant,

WILLOUGHBY WOOD.

EXEMPLARY EMPLOYMENT OF LABOUR.—His Grace the Duke of Newcastle, with a view of affording present employment for the labouring poor on his estates, and of enhancing their future comfort, is carrying out a series of benevolent and useful undertakings, which, besides their more immediate object, cannot fail to prove beneficial to his Grace in a pecuniary point of view, and at the same time to afford a striking example of the close affinity which exists between the best interests of a landed proprietor, both in a social and economical point of view, and the moral and physical well-being of the humbler classes around him. A small village, to consist of 20 cottages and a spacious lodging-house, in the Tudor style of architecture, and combining every comfort and convenience which the humanity of the age has suggested for the more decent lodgment of the poor, has just been commenced by his Grace's directions at Hardwicke. In the same locality another class of work, designed to provide future occupation for the tenants of the neat and picturesque abodes now rising in its midst, has been begun. The land, which is now wet, marshy, and unprofitable, is being thoroughly drained, and will shortly be converted into irrigated and fertile meadows on the plan which has been carried out with such signal success, and to such a considerable extent, on the neighbouring estates of the Duke of Portland. Upwards of 60 labourers have been employed on this work during the winter, their wages being 3s. per day. During the late storm many of the able-bodied poor of Workshop and adjacent places were thrown out of work. Between 30 and 40 of these are now employed in clearing and trenching, preparatory

to planting, a portion of the maize on the Manrhill, at wages which enable the best hands to earn as much as 4s. per day, and the inferior hands 2s. 6d. His Grace has upwards of 250 persons employed in various ways on his Clumber and Worksop estates, at excellent wages. Between thirty and forty labouring men are also constantly employed on the duke's home farm, their wages averaging 16s. per week, in addition to which they enjoy considerable perquisites, in the shape of cottage rent, garden allotments, allowance of malt and hops, extra wages during harvest and for overtime. A large number of woodmen are employed by his Grace at wages ranging from 2s. 9d. to 3s. 6d. per day, the humblest labourers receiving 2s. 6d. The wholesome employment

thus afforded to a great body of the workpeople, besides its beneficial effect on the labouring classes themselves, tends materially to relieve the pressure of the poor rates on the district in which his Grace resides, and not less to absorb that fearful element of destitution and despondency which gives such painful distinction to some of our agricultural counties. These benevolent efforts of the Duke of Newcastle to improve and elevate the condition of the poor on his estates, as well as the wise and vigorous administration of his property in other respects, more especially in providing for the essential necessities of all classes within the sphere of his territorial influence, have made him highly and deservedly popular among all who know him.

LONDON, OR CENTRAL FARMER'S CLUB.

IMPERFECT MODE OF TAKING THE CORN AVERAGES.

The first monthly meeting of the season took place on Monday evening, Feb. 6, when the subject of "The Imperfect Mode of Taking the Corn Averages" was brought forward by Mr. W. Pain, of Compton, Winchester. The attendance on the occasion was unusually numerous, and included representatives of the Arundel, Blandford, Winchester, Croydon, North Walsingham, Northiam, and other local clubs. The interest of the occasion was enhanced by two circumstances—one, that the meeting was the first which has been held since the resolution adopted in December with the view of making the club the central farmers' club of the kingdom; the other, that arrangements had been made for holding an interview on the following day with Mr. Cardwell, the President of the Board of Trade, on the subject appointed for discussion.

The CHAIRMAN, Mr. W. Fisher Hobbs, in opening the proceedings, intimated that there were two rules which he should rigidly enforce in conducting the discussions of the club during his year of office; one was, that with the exception of the introducer of a subject, no speaker should be allowed to address the meeting for more than a quarter of an hour—the other, that every discussion should terminate at eight o'clock (Hear, hear). He was happy to have to welcome so many gentlemen from the local clubs, and he trusted that, by means of the union of these institutions with the London Farmers' Club, they would be enabled to carry such measures as would prove advantageous to the agricultural community at large (Hear, hear).

Mr. W. PAIN then addressed the meeting as follows:—Gentlemen, the imperfect manner in which are made the returns of corn sold in the various markets from which the published averages are collected, has long engaged the attention of agriculturists throughout the country; and although loud and deep have been the complaints of the evil, and manifold the injuries pointed out as arising from it, still no active means have as yet been tried, by those most interested in the matter, to bring it under the notice of Government, with a view to its remedy. I regret that it has not fallen into abler hands than mine to open the discussion on a question of such vast importance; but I am pleased to see so large an attendance of gentlemen from other societies, as well as members of our own club, because it shows there is a great interest taken in the subject, and it will relieve me from doing more than simply laying a few facts before you, knowing as I do that I shall be

followed by many gentlemen of experience and ability, who will advance both facts and arguments, enabling us to set our grievances on this score in a proper light before the Government and the public, and show some feasible plan for remedying them. It will not be necessary for me to go back to the origin of taking the corn averages, or the purpose for which they were collected, but merely to point out the way in which the existing law provides for the return. The act of parliament which regulates it is the 5th and 6th Vic., c. 14, and is intitled "An Act to amend the laws for the importation of corn." This act repeals the 9th Geo. IV., and its chief object was to ascertain the prices of home-grown corn, to regulate the duties to be paid on foreign. The schedule contains a list of 290 cities and towns in England and Wales, from which the returns are to be made to certain inspectors. These inspectors are appointed, in the city of London, by the Lord Mayor, and in the city of Oxford and town of Cambridge by the Chancellors, Masters, and Scholars of the respective universities. In other towns, officers of excise are to act as corn inspectors, excepting where the inspectors appointed under the 9th Geo. IV. were then still holding office. In the city of London, or within five miles of the Royal Exchange, not only all corn dealers, but every person who shall sell any corn in Mark Lane, are required to make a declaration before the Lord Mayor, before any sale by them, that the returns to be made by them shall contain the whole quantity and prices of corn so to be bought by or for them, with the names of the seller; and every other person who in any other of the 290 cities or towns shall buy British corn to sell again, and many other persons as well, are required to make a similar declaration. These returns are to be made by the above parties on the first market day in every week, and the inspectors are to enter the returns made to them in a book, and transmit to the Comptroller weekly an account of the quantities and prices of corn sold; but the inspectors are forbidden to include in such returns any account furnished to them by any person who has not made the necessary declaration. The Comptroller of Corn Returns is to add the total quantities of corn sold during the week in the different towns together, and also the total prices for which the same shall appear to have been sold, and divide the amount of such prices by the quantities; the product of six weeks is then to be added together and divided by six, and the product is deemed the weekly average which is to be pub-

lished in the *Gazette*. The inspectors are also to affix a copy of the last return on the market-place on each market day. All corn dealers in the different markets before alluded to are liable to a fine of 20*l.* for each and every calendar month they neglect to make a declaration as before mentioned, and also a further sum of 20*l.* for neglecting to make a return; and any person making a false return is deemed guilty of a misdemeanour. This law might possibly have answered the purpose for which it was made, viz., to regulate the duties on foreign corn, provided it had been properly carried into effect, which certainly is not the case; for not only are there hundreds of people, who under this law are required to make the declaration, who never dream of doing it, and hundreds more who never make any return at all, or, if they do, make it imperfectly; but when it is considered that these averages are made the basis upon which corn rents and tithe rent-charges are calculated, it becomes of the utmost importance that the average prices of all corn grown and sold should be ascertained with the greatest possible exactness, or otherwise the landlord and tithe-owner, or the producer, must inevitably to some extent be injured. The present system wants a complete revision. Of my own knowledge I am aware that the assertions I have made as to the neglect to make returns is valid as respects the market I attend; and I am convinced from an examination of the inspector's report, that not one-third of the corn sold there is ever returned. I know that it has happened in that market (and I do not expect this is an isolated case), that when valuers have had occasion to ascertain the average price on a certain market-day, for the purpose of fixing the amount of a valuation, they have found returns made of wheat alone; although it has been known that barley and oats, and that, too, in large quantities, have been sold on that day. This must, of course, be very injurious to the tithe-payers generally; because the prices of barley and oats in the county in which I reside are far below the general average, and ought of course, if we are to have a national average, to counteract the high prices obtained in the good barley-growing districts. I think it also worthy of consideration whether the tithe rent-charges in each county should not be regulated by the average prices of that county alone. I will now read an extract from a paper from Doncaster, which shows the attention this subject is exciting in that quarter:—"At a time when the attention of the country is being directed to the importance of collecting authentic statistics of agricultural produce, the loose and imperfect manner in which the official corn averages are ascertained ought certainly not to escape notice. In our market—and it is by no means singular in this respect—a great number of buyers systematically evade the duty which the law imposes upon them, of making a return to the Government inspector of the nature and amount of their purchases. This practice has now become so common, that, in the opinion of factors and dealers thoroughly acquainted with our market, above half the quantity which changes hands here every week is never brought under the inspector's notice at all. The last return makes the total quantity of wheat sold in Doncaster market 719 qrs.; while it is well known certain dealers from the large manufacturing towns, who regularly attend here, frequently purchase as much as 300, 400, and 500 qrs. on their own account. This evasion of the law is to be attributed to the carelessness and indifference of the buyers, who, notwithstanding the penalties they are exposed to, will not give themselves the trouble to make the required returns; and also to the

laxity of the officials, who never enforce the law. The evil would probably be remedied in a great measure by making it imperative on the seller, as well as on the buyer, to furnish a return of corn sold, as then both parties would mutually check each other. A few prosecutions for the penalties might also have a beneficial effect. When it is remembered that the tithes are determined by the official averages, and that the trade of the country is materially affected by them, and that even great political measures are sometimes based upon them, a correct method of striking them surely cannot be deemed a matter of small importance." I see by the published returns for last week, in the market I attend, no mention is made of either barley or oats. There is a practice generally pursued by farmers, which tends much to their own injury; that is, the consuming the tilling corn on the farm, instead of selling it in the market. I have heard it suggested that farmers should make returns of all corn consumed at home; but in my opinion it would be open to fraud, and could not be relied upon. But we have the remedy in our own hands, by selling, instead of consuming, the tilling corn; thereby greatly reducing the averages. As I find that our committee intend to follow up this discussion by bringing the subject under the notice of the Board of Trade, and as I think we shall be unanimous in resolving that some change is necessary, we should be prepared with some suggestion and propositions for effecting this change. I will briefly state my views on the point, and trust that we may be able unitedly to lay before the Government some plan at least worthy of consideration. I would in the first place appoint the Excise or Inland Revenue officers to collect the returns in every market. I would compel every grower to make a weekly return of all corn sold by him, either in or out of the market; such return to be verified by the purchaser. I would impose a small fine on all parties neglecting to make such returns, and give half the penalty to the informer. No person should be allowed to make a return on a second sale, as the dealers' profits and expenses would then of course be added to the original price. By these means I think you may insure correct returns. These suggestions I offer for your consideration, and I trust, in the few words I have spoken, I have attracted your attention to the evils of the present system. I will now submit, as a resolution for your consideration—

"That, in the opinion of the members of this club, the present mode of taking the corn averages is imperfect in its operation, and injurious to the agriculture of this country. That returns should be made by the grower of all corn sold by him, verified by the signature of the buyer; such returns to be taken by the Excise or Inland Revenue officers." And I shall now be pleased to listen to the observations of my friends around me, and I doubt not that an injustice so manifest will of itself suggest a remedy.

Mr. PILE (Winchester) said, the subject on the card had already been discussed on two occasions in the Winchester Farmers' Club, and he might mention, as a proof of the deep interest which was felt in it, that it was the very first question discussed after that club was established. It was now, perhaps, more than ever important that the average price of corn for each county should be correctly ascertained, inasmuch as every recurring year added to the number of tenant farmers, whose money payments of rent were governed by that price (Hear, hear). The view he took of the matter was this: When the tithe rent-charges were commuted, they were supposed to be commuted on the fair average price of the home produce of

the kingdom, including the "tailings" as well as the best corn, the "tailings" in some counties being known as seconds; and he thought no tithe-rent receiver could object to take his rent-charge upon such terms. He felt, however, that the producer ought not to be charged with the profits of trade, and that he had nothing to do with the price of foreign produce. In his opinion, therefore, the returns should be confined to the first sale; buyers and sellers should be compelled by law to make a return upon that first sale: and the whole of the corn grown in the kingdom should be returned, in order to regulate the averages for all purposes for which the averages could be required (Hear, hear). But the difficulty was, how to accomplish this object; for at present there was a great deal of corn which the farmer sold at home, and never brought into the market at all. They had also heard from Mr. Pain that the averages were confined to 290 cities and towns only. Now a simple and inexpensive mode, one involving little trouble to the farmer, would be to make it compulsory upon every grower to return, once a month, say the first Tuesday of every month in the year, all corn sold by him in that interval, whether at market or at home. This return, with the name of the person making it on the envelope, should be forwarded, sealed, to the clerk of the Board of Guardians for the particular union. A similar return should be furnished in the same manner by the purchaser; and it should then be the duty of the clerk of the union to transmit them, unopened, to the Board of Trade in London. Whilst on the one hand such a method as this would entail no expense, on the other hand it would give little trouble to the farmer; for nothing could be more easy and simple than to sit down for a few minutes, once a month, and insert, in a printed form, the quantity and price of each description of grain he had sold, and seal and transmit it to the clerk to the Board of Guardians. They would agree with him that the averages ought to be taken on the produce of their own soil only, including the "tailings" as well as the best, and altogether irrespective of the prices of foreign corn and the profits of the corn trade, and that they should be confined to the first sales (Hear, hear). If the system he recommended were adopted, this result would be attained at a trifling amount of trouble and expense. It was scarcely necessary to say that the present averages were based upon returns that were taken in a most careless and imperfect manner. The grower was the only party who could give information against the purchaser, for either neglecting to make returns or making them inaccurately or incompletely. And it was not likely he would lay an information against his best customer (Hear, hear). He knew it was the desire of his brother farmers to act honestly. They wanted nothing that was unfair to the tithe receiver. They only wanted equity, and, in justice to themselves and their families, that they should not be required to pay upon more than the fair average price of the corn they sold.

Mr. R. BAKER (Essex) said, the question of corn averages had become a question rather as between the farmer and the recipient of tithes, than the farmer and the sellers and importers of corn. If the present system of taking the averages had existed previously to the passing of the Tithe Commutation Act, the receiver of tithes would have a valid objection to any alteration. But as it had been established since that period (viz., in 1842), their objection would not now hold good. It was doubtless most unjust to the growers of corn that they should have no participation in making the returns of the value of the corn they sold, but that the province of making them should be in the hands of the purchasers, who might possibly

be influenced by circumstances to prepare the returns in such a manner as to be positively injurious to the farmer (Hear, hear). To remove this injustice, then, they were assembled together on the present occasion. They had not met to advance the interests of the farmer at the expense of the tithe-receivers or of any other party. They simply required to be placed in the position in which, as citizens of the state, they ought to be placed—that of being dealt fairly and justly by on all occasions. With this view, he begged to express his concurrence in the resolution suggested by Mr. Pain, and to thank that gentleman for the manner in which he had brought forward the subject for discussion.

Mr. GRAINGER agreed that all returns should be made by the grower as well as the purchaser, and that corn once returned should not be returned again. According to the existing practice, corn was often returned twice and thrice over, although it had never been moved. And an evil in the locality in which he resided (though it might not be the case in every district in the kingdom) was, that they were in the habit of selling their corn by weight, and that often it was represented and sold as from a pound and a-half to two pounds more than it actually weighed. Of course when the averages were fictitiously made up, they must tell very much against the seller, particularly in cases of valuation of crops just upon the eve of harvest (Hear).

Mr. LEAR (Chairman of the Arundel Farmers' Club) said that the system of taking the corn averages had excited the attention of the club to which he belonged, who had come to the conclusion that it was a very unfair one, and that its results were arrived at in a most partial manner. The question was becoming of more importance daily, because, although the tithe rent-charge might be regarded as settled, still the system of corn rents was everywhere on the increase, and the imperfect mode of taking the average was in that respect highly injurious. The returns which were now prepared did not fairly represent either the quantity or the price of the corn sold. One instance of the sort he might mention. In 1848 a friend of his sold two samples of wheat in a certain market; one of these was grown in that year, the other in 1847, and of course the quality was different, and the price too. But upon examining the return he found that it contained only the better samples, and that the other inferior one was altogether omitted. With regard to the mode in which the system might be improved, in his opinion it was not advisable to extend the area for taking the average; in fact, that it was preferable to confine it to those markets where the corn was "pitched." At those "pitched" markets there was always a clerk of the market, who could supply the forms to buyers and sellers, and exercise a general superintendence over and collect the returns when completed; thus would be obviated many of the objections the farmers now entertained, such as its being inquisitorial and so forth, to making return of the corn they sold at home. If the returns were made only at the markets which were included in the schedule of the Corn Importation Act that difficulty would be obviated, and there would always be the necessary means at hand for securing the requisite returns. He thought also that the returns should be made in the first instance by the seller, being the grower, and that the same should be verified by the buyer; for it could never have been intended that the averages should be taken on corn which had passed through several hands in succession, and been ultimately sold at a larger profit than the grower could have realized for it (Hear).

Mr. NESBITT was of opinion that the buyer and the seller ought respectively to make their own return. They would then get a perfect and distinct account of all the corn grown in the country. When the deputation met Mr. Cardwell on the following day, it should, he thought, be pointed out that a return from the farmer of all the corn that he sold, and from the buyer of all that he bought, would alone give a correct account of the whole produce of the country. He wished to ask whether it was supposed by gentlemen there that the general averages of the kingdom had any effect on the prices of corn sold by the farmer? ("No, no!" and "No doubt!") There could be no doubt that the general averages had a tendency to regulate the price of corn in the market (Hear, hear, and "No!"). If it were the fact, as had been stated, that corn had been sold over and over again before getting into the hands of the miller, that must have had the effect of raising the average price of corn in the kingdom, and therefore of raising the price at which many farmers sold at first hand. If it went forth that they considered the present mode of taking the averages to have the effect of raising the price, it would at once be thrown in their teeth that in that case it also raised the price at their own homesteads. ("No, no!")

Mr. J. PAIN (Bedfordshire) thought the averages of the country had nothing to do with the market prices in the county towns. On the contrary, the latter were regulated solely by the supply and demand (Hear, hear). Whilst engaged in making valuations, he had often seen occasion to lament the unfairness of those valuations, in consequence of the prices laid before the valuers. In Bedfordshire the averages were taken on the several quarter days, but in some instances no account whatever was rendered of the sale of corn, although he himself knew of hundreds of quarters having been disposed of; and he had frequently observed also that the prices returned on the average of the markets were anything but the correct ones. He was convinced, if the prices of all descriptions of corn were included in the returns, a party who took a crop at a valuation would be in a much better and a much fairer position than he could by possibility now be. It was high time that something should be done in order to improve the method of taking the averages; and it was for the agricultural community to consider whether they could not, without reference to corn rent or tithe rent-charge, suggest some honest and direct mode of effecting that object.

Mr. SPEARING could bear testimony to the inaccuracy of the returns which had come under his notice. In one instance, he sold at a single deal, in November last, 80 quarters of inferior barley at 30s. a quarter. Subsequently he had the curiosity to examine the returns, when he found that his 80 quarters were omitted; that the total quantity sold was between 100 and 200 quarters, and that the average price was 39s. It was clear, therefore, that if his 80 quarters had been returned, the average must have been materially reduced (Hear, hear). He could not agree with Mr. Pile that the returns should be made through the clerks to the boards of guardians. They were generally, no doubt, a respectable class of men; but their employment for any such purpose would be most objectionable.

Mr. COOTE, of Sussex, said, that in the Brighton market the returns of averages made by the importers differed in such a degree from the facts, as tested by 28 sellers, that, upon a payment of £100 tithe, based on those returns, there would be a loss to the tenant-farmer of from 8 to 10 per cent. The same effect would be produced in calculating a corn rental; and it was to be borne in mind that the number of farms held on the

principle of a corn-rent was greater now than it had been for many years past.

Mr. CURTIS, of Norfolk, as a tenant-farmer who had just taken a ten years' lease of a farm, one-half at a corn rent, and the other half at a fixed money payment, had narrowly watched the averages, and had found it impossible to keep pace with the prices quoted in Norwich market, though the land he cultivated was capable of growing as good corn as any land in England. The fact was, that three-fourths of the barley in the market was purchased on commission for the London brewers, and this was returned; whilst all that was sold at 6s., 7s., or 8s. below the price of the best malting barley was omitted from the returns.

Mr. SKELTON, of Lincolnshire, would give an instance of the abuses of the present system, feeling that such facts, supplied by practical men, must tend to produce a remedy for the evils complained of. Much had been said respecting the non-return of sales; but his impression was that, in some cases, there was equal reason to complain of excessive returns. As the law now stood, it was obligatory on every buyer of corn to return the whole of his purchases, and there could be no doubt that very frequently the same sample of corn, passing through several hands in succession, was returned many times over. It was well known that the produce of the last crop was much below the average of the crops for some years previously. As soon as it was ascertained that the harvest was defective, the greatest excitement and speculation arose in Wisbeach market, as would be apparent from a glance at the returns. In the first place, comparing the first four weeks of the harvest with the corresponding period of the year before, he found that about one-half as much more was returned for the four weeks of 1853 than for the four weeks of 1852. For the eight weeks after harvest there was the same rate of excess in 1853 over 1852: and this, he it observed, in the face of a notoriously short crop. For the twelve weeks after harvest the amount returned was just equal in 1853 to what it was for the same period in 1852. Now it was an indisputable fact, which had come under his own notice—indeed, he himself had been concerned in the transactions as a buyer—that cargo after cargo of corn had been sold over and over again, without having been once moved, at advances of 3s., 4s., 6s., and 8s. per quarter; and all these sales had to be returned as if they were sales of distinct and separate cargoes. So far as his brother merchants in the district were concerned, he could take upon himself to answer for them, that they made faithful returns of all the corn that was bought in that market. But the returns he had cited relative to the very deficient harvest of last year shewed conclusively, that through their having to return all the corn that was sold, and that at a time of great speculative excitement, a false idea was given both of the quantity and of the price. In proof of the accuracy of his position he would continue his statement of the returns at Wisbeach market. At the end of twelve weeks after harvest, the speculative feeling had very much cooled, prices being comparatively very high. Accordingly, the returns shewed that for the sixteen weeks after harvest the sales were about three-tenths less in 1853 than in 1852; for the twenty weeks after harvest about one-third less in 1853 than in 1852; and for the twenty-four weeks after harvest nearly one-half less in 1853 than in 1852. His object in mentioning these facts was to prove that the returns must be fictitious, alike as to quantity and price; and an experience of from 30 to 35 years in the corn trade convinced him that nothing could be more fallacious than the

present system of taking the averages (Hear, hear). With regard to the remedying of this state of things, he would suggest that returns by the grower should be made compulsory, and a penalty for negligence or returning a sample of corn more than once. As the original intention in requiring returns must have been to arrive at the actual quantity and value of the farmer's produce, it was scarcely necessary to say that, so far as that end was concerned, the system now in operation was totally useless. The question was one of great importance in reference particularly to tithes, rent-charge and corn-rents, and he trusted they would not let it drop until they had obtained a remedy.

Mr. BRADSHAW did not think it possible to remedy existing evils so long as the returns were made only by the vendor and the purchaser. What they should aim at securing was, an honest return by the producer; and he hoped they would keep the question clear of everything else. The other day, while visiting in the midland counties, he was told by a gentleman that there were two farmers living within sight of his house, who always returned 63lbs. per bushel, in order that they might have the advantage of having it said that they obtained the best price in the market (laughter). He entirely agreed with preceding speakers that the present system of averages was most iniquitous.

Mr. STENNING said they appeared to be unanimous on one point—namely, that the present mode of taking the averages was imperfect, and that a remedy was loudly called for. He agreed with Mr. Pain that the return should be made weekly, and made both by the buyer and by the producer. He differed from one of the preceding speakers, who thought that the returns should be confined to pitched markets. In his opinion, they should extend to every market in the kingdom. It would be a very easy thing to make the return; farmers who did not go to market themselves might send it by a neighbour; and he hoped great care would be taken to secure as much accuracy as possible. The time was now arrived when it became the Club to come to a conclusion with regard to a special plan; and, for his own part, he must say that the plan suggested by Mr. Pile appeared to him the best and safest one which he had heard mentioned that evening.

Mr. REEVES, of Winchester, said it might not, perhaps, be out of place for him to state a circumstance which occurred a few months ago in Romsey market. About Michaelmas, when wheat was selling at £15 or £16 per load, a sample was offered to a miller at £7 per load. He said he would not buy it then, but would do so on the following day, at Southampton. The next day, he bought the wheat at £7 per load, and made a return. A few days after, the corn inspector received a letter from the Board of Trade, saying that there must be some mistake about this wheat at £7 per load.

The CHAIRMAN asked what was the weight?

Mr. REEVES replied, 40lbs. There were ten sacks, at 14s. per sack. This showed that the Board of Trade was not entirely ignorant of what was going on. The party wrote back that the deal was a *bona fide* one, and that he was willing to take his oath that the return was fair and correct. If the price had been a high one, he would probably never have heard anything at all about it (laughter).

Mr. AICHESON said he was perfectly aware that the present system of averages was a very bad one, and very detrimental to the agricultural interest at large; and more especially to the tenant farmer. As, however, a deputation was going to

the President of the Board of Trade on the following day, they must be prepared to state some means or process by which their end might be attained; and at the same time to show that they did not call upon the Government to incur any expense. As the duty of making the return was to be incumbent on the vendor and the grower, he would suggest that these parties should be called upon to pay one penny on every quarter of wheat sold; and that sum collected throughout the kingdom would more than cover the cost of making the returns. Whatever the deputation might say on the subject, they must, he thought, be prepared to take on themselves, on behalf of the farming interest, any expense which might arise from the adoption of their suggestions. There was another point which he wished to mention, and which appeared to him to be peculiarly interesting at the present time. The committee were endeavouring to extend the benefits of this Central Club to all the local clubs throughout the kingdom. Never could there be a better opportunity of shewing that the club was useful to farmers throughout the country, and of convincing the Government and parliament that it represented absolutely and *bona fide* the whole body of farmers. On that occasion, therefore, as one of the oldest and earliest members he would take it upon himself to give them a little advice. He would impress on every farmer, to whatever locality he might belong, the absolute necessity which there was for union. (Hear, hear). They must not sit down and wait quietly to see their objects carried out; but the members of associations in different parts of the country must come forward and join this central body, in order that it might be able to stand forward as the representatives of the entire farming interest of the kingdom (cheers).

Mr. WYNGATE, of Lincolnshire, said it ought not to be forgotten that corn was sold by different measures and weights, and that this rendered it impossible that the returns could be accurate. If he recollected rightly, there was at one time an act passed for the purpose of securing uniformity of weights and measures, but as yet they had not seen it carried out. (Hear, hear). There appeared to be the greatest difference of opinion as to what constituted a load. In some places the load was five quarters, in others it was only three, and that was a state of things which ought not to be allowed to continue. All corn should, in his opinion, be sold in and out of the market, and that the return should be made both by the buyer and the seller. On the latter point they were all pretty well agreed; and whether the return was sent to the clerk of the Board of Guardians, or to some other official, the great matter was to take care that it was thoroughly honest. (Hear, hear). He held in his hand a letter from an hon. member for Lincolnshire, Mr. Stanhope, who said he should be very happy to assist them in any way in his power in the House of Commons; adding, that as he was not a practical man, he thought it best that the subject should first be discussed by the club.

Mr. WOOD, of Sussex, said he quite concurred in all that had been said that evening as to the evils of the present system. He could not assent, however, to the proposal of Mr. Aicheson with regard to payment. (Hear, hear). He thought the Government were bound to defray the expense of taking the averages in an honest and just manner, and he did not see why farmers as a class should be called upon for pecuniary assistance. (Hear, hear). They already did their share, and ought not to have any additional barrier thrown upon them. Here was a case in which the Central Farmers' Club promised to be useful, and he had no doubt that if they were properly

supported by the agricultural community generally, the object would be secured.

Mr. TRETREWY said he quite concurred in the opinion just expressed, with regard to the suggestion of Capt. Aicheson. He could not conceive why any more expense should attend the return by the grower than attended the return by the buyer; the one did not involve any more trouble than the other. That the subject was one which might very properly be taken up by the club there could be no doubt whatever. It involved no party question—it attacked no individual or class interest; all they sought was a good, true, and correct return. (Hear, hear.) They had justice on their side, and if the matter were pressed on the attention of the legislature, they had a fair prospect of success. It was not for them, he thought, to point out to the legislature how the thing was to be done—it was enough to point out the defects of the present system, and they should leave it in the hands of the Government to remedy the evil. As regarded the manner in which the return should be made, he thought it should be a return by the seller and by the buyer on the fly-leaf.

Mr. BURR, of the Blandford Club, said, in his neighbourhood not half of the corn sold in the market was ever returned at all. His father was a miller from 1792, and up to his death, which happened in 1827, he never made a return. His brother, who carried on the same mill, said he believed he once made a return when he bought some wheat in Blandford market, but he was convinced he never made one on any other occasion (laughter). Mr. Attwood, of Ringwood, who had a mill on the same stream, said he once made a return of ten quarters, and that was all that he could remember returning. Mr. Porter, who lived in the same neighbourhood, said he, too, never made a return. He objected to the proposal to pay a penny for collection. The excise department was well paid for the performance of its duties, and what was proposed would involve very little extra labour. As regarded the suggestion that the return should be sent to the Board of Guardians, he could not at all concur in it. Having been a guardian ever since the new poor law was established, he was convinced that it would not work well; the guardians had already quite enough on their hands. He quite agreed with those who held that the return should be made by the grower. His impression as to

the imperfect nature of the present system was greatly strengthened by what he had heard that evening.

Mr. PILE said, the adoption of his suggestion would not throw much additional labour on the board of guardians. What he suggested was simply that the return should be sent sealed to the Board of Guardians, and by them be transmitted to the Board of Trade.

Mr. TRETREWY was confident that the Poor-law Board would not consent to it.

The CHAIRMAN said, he believed the time was come for closing the discussion, and perhaps it would be right for him to make a few remarks before Mr. Pain replied. He was very much delighted to find that so many members of the club, including speakers from no less than ten or twelve counties of England, had expressed their opinion on the subject, and that they were unanimous as to the present imperfect mode of taking the averages. He quite agreed with Mr. Aicheson that the time was come when this club was likely to be really of use to the practical farmers of the country, and he hoped they would not let slip that opportunity of shewing the agricultural community what their intentions were. He need not tell them that he considered the present system of taking the averages most defective. It would be his duty, as chairman, to go before the President of the Board of Trade on the following morning, and explain the views of the club on this subject, and he hoped every gentleman who felt inclined to do so, would join the deputation, which would meet there at ten o'clock. He was sure he expressed the views of the committee when he said they would be most happy to see them. He did hope and trust that that commencement of their proceedings was a fair specimen of what they would do throughout the year, and he felt persuaded that, as they had been so nearly unanimous in the expression of their opinion, so they would adopt a resolution which would help to carry out the views of the meeting. He evidently agreed on the principle laid down, and would do his best on the following day towards rendering it effective.

Mr. PAIN having briefly replied, the resolution proposed by him at the conclusion of his introductory address was carried, and the proceedings terminated with a vote of thanks to Mr. Pain and the Chairman respectively.

DEPUTATION TO THE PRESIDENT OF THE BOARD OF TRADE ON THE SUBJECT OF THE CORN AVERAGES.

On Tuesday, Feb. 7, at noon a deputation from the Central Farmers' Club had an interview with the Right Hon. E. Cardwell, the President of the Board of Trade, in Whitehall, to lay before him the views of the club in reference to the present imperfect mode of taking the corn averages. The deputation was introduced by Sir J. V. Shelley, M.P., and consisted of the following among other gentlemen:—Mr. W. Fisher Hobbs, chairman of the club; Messrs. Pain, Spearing, Reeves, and Pile, from Hants; Messrs. Cressingham, Wood, and Stanning, from Surrey; Mr. Ambrose, from Essex; Mr. Granger, from Cambridgeshire; Mr. Skelton, from Lincolnshire; Messrs. Coote, Wood, Body, and Dawes, from Sussex; Mr. Bart, from Dorsetshire; Mr. Harryman, from Kent; and Mr. Corbet, secretary of the club.

Sir J. SHELLEY, addressing Mr. Cardwell, said: I appear here with a deputation from the London Farmers' Club, our object being to bring before you the mode in which the corn averages are taken. As farmers, we all think the present system very injurious; and, having read the statement which you made the other night, that the whole subject of agricultural statistics is under the consideration of the Board of Trade, we hope that this branch of it will not be neglected. The gentlemen who are to address you will point out the evils which exist, in the hope that you will turn your attention to the matter, and be able to find a remedy. I need not tell you that in some towns no returns at all are made. Looking at the facts of the case in the different towns where the returns are made, I believe it will at least invariably be found that the

inspector's return and the farmer's return differ very materially; and, without referring to the tithes, which are, as you are aware, paid on the averages, I may observe that, as corn rents are affected, it is obvious that, if returns are to be made at all, they should be as accurate as possible. With these observations, I beg to introduce to you, sir, Mr. Fisher Hobbs, the chairman of the London Farmers' Club.

Mr. FISHER HOBBS said, I have the honour of appearing before you, sir, with a deputation from the Central Farmers' Club, and, as their chairman, it will be my duty to mention to you the great evils which I consider to exist in the present imperfect mode of taking the corn averages. I believe the object of taking the averages is to obtain an accurate return of the produce grown, and of the value of that produce. It is now many years since the interest which was formerly felt by merchants in making returns ceased to exist. In 1842, the present system was established, to assist in carrying out the measure of Sir Robert Peel with regard to the introduction of foreign corn. All corn laws now being abolished, merchants have no interest at all in making returns, and it is well known that throughout the kingdom returns are made very imperfectly. I need not enter into any details on that point, because the gentlemen who are to follow me will explain much more minutely than I could do the fluctuations which exist. I am, however, prepared to shew that the present mode of taking the averages is very imperfect, and also that it is most unjust. It is most imperfect, because, at the present time, only the superior grain is returned. In most instances only one-third, and in many only one-tenth is reported. It is very unjust, because many farmers take land on a corn rent; and, in this respect, the system of taking the averages operates in the case of many farmers most injuriously. If you will allow me, sir, I will read to you a statement which appeared a short time since in one of the Brighton newspapers, respecting the imperfect mode of taking the corn averages there. It appears that in one week no return was made at all—on the 16th of January, 1854. This is a copy of the inspectors' return:—"No rye, no wheat, no barley, no oats, no beans, no peas." By the farmers' return, there were—70 loads, or 300 quarters, of wheat, and 200 quarters of barley. In the following week the inspector made a return of 27 quarters 4 bushels of wheat, and 35 quarters of oats; barley, rye, beans, and peas none." Here there was a very great difference between the inspector's return and the farmer's return. The London Farmers' Club has for some years past taken considerable interest in this question, and not only the Central Farmers' Club, but the local clubs throughout the kingdom. In the year 1850, the London Farmers' Club discussed this question, and their resolution on the subject at that time was as follows:—"That by the present system of taking the averages the price of corn is represented to be higher than actually is the case, and hence operates unjustly in all contracts based upon it, and demands the immediate attention of the legislature." The local farmers' clubs—I would refer especially to the Winchester one—adopted a similar resolution. Last evening I had the honour of presiding at a very influential meeting of the Farmers' Club, where there were present farmers from most of the agricultural counties of England, and I believe gentlemen from ten or twelve counties spoke on the subject. The resolution of this meeting was—

"That, in the opinion of the members of this club, the present mode of taking the corn averages is imperfect in its operation, and injurious to the agriculture of this country. That

returns should be made by the grower of all corn sold by him, verified by the signature of the buyer; such returns to be taken by the Excise or Inland Revenue officers."

It cannot, sir, I think, be questioned that the mode in which the returns are made from various parts of England is very imperfect, when it is considered that it is made sometimes by weight and sometimes by measure. During the present and last year the produce of the wheat of this country has been very light in weight, as well as deficient in quantity. The returns, for example, from Lincolnshire, a great agricultural county, are made at 63lbs. per bushel; whereas, I believe the average weight of the wheat of Lincolnshire at this time (it was certainly the case last year) is not more than from 58lbs. to 60lbs.; and that difference acts very injuriously with regard to price. Again, at Wakefield, which is a very important market, and where there is a great deal of inferior British corn sold, the returns are 60lbs. to the bushel; and I believe that in most of, if not in all the northern counties where the lands are wet, wheat does not generally average so much. Now sir, it is the opinion of the Farmers' Club that, as the corn laws have been abolished, and as the class of persons who formerly returned the averages do not now feel the same interest in them, the present system should be entirely abolished, and that in lieu thereof every grower should be compelled to make a return, that return to be verified by the purchaser, and that that one return alone should be taken into the averages. That appears to me to be a very simple system; and, if it be the desire of the legislature to obtain a correct return of the produce grown, and of its value, I see no system so likely to lead to the attainment of that object. On behalf of the farmers of England, I can only say that they look upon this as an act of justice which is due to them. They do not wish to upset the system of the Tithe Commutation Act, nor the system of letting land on corn rents—a system which appears to be increasing in its operation every day, and which is frequently regulated partly by price, and partly by the payment of a fixed sum. It is but justice to the growers of this country to require that they should only pay upon the value of their own produce. We ask the legislature, therefore, to amend a system which is now so imperfect, and which bears so injuriously upon our interests. With regard to the question of statistics, which has been referred to by my friend Sir John Shelley, I can only say that the farmers feel, as I have said, that it would only be an act of justice to them to re-adjust the system of taking the averages; and if in any way the one object can be so arranged as to facilitate the other, the Farmers' Clubs will listen with great respect to any proposal that may be made to them by the Government. I will not enter into the question any further, as there are other gentlemen present who represent local farmers' clubs, and who will be able to explain to you better than I can, the views which farmers entertain on this subject.

Mr. PILE, delegate from the Winchester Farmers' Club, followed. He said: Mr. Hobbs has entered so fully into the subject as to have left me very little to say. To prove to you, sir, that farmers have for a long time felt the unfairness of the present system of taking the averages, let me say that, after the Winchester Farmers' Club was established, in 1850, the first subject which they discussed was that of the corn averages. The resolution which they came to was, "That in the opinion of this meeting, the present mode of taking the averages is imperfect and unjust to the agriculturists, and that it would be more beneficial to them, and the community at large,

if the averages were taken from districts in each county, and a return thereof made compulsory by law both on the grower and on the buyer." In further proof that the averages are incorrect, I may state that in March last the averages for Berkshire were taken at 1,596 qrs. of wheat, and the price at 50s. 1d. Now, Reading market is the best market for wheat in Berkshire, and the average of that market in the week was 48s. 2½d., and in London only 48s.; yet the Government averages for the country were 53s. 1d. This shows the careless manner in which the duty was performed. The subject of the corn averages has been discussed by the Winchester Farmers' Club during the past year, and the resolution adopted on the occasion was, "That in the opinion of this meeting the present mode of taking the corn averages is imperfect, and most unjust to the agriculturist—that as at present the returns are only made on the best qualities of corn, the average price which rules for the tithe rent-charge is calculated on false data—that in the opinion of this meeting the return should be made compulsory upon the grower, backed by the signature of the buyer, and should be collected in every market of England and Wales by the Excise." It is shown how very imperfect the system is, in a letter addressed by Mr. Cowan, a large land-agent near Barnstaple, in Devonshire, to the Right Hon. J. W. Henley, President of the Board of Trade, in 1852. That gentleman says, "It is now more than ever important that the average price of corn for each county should be correctly ascertained, because every year is adding to the number of tenant farmers whose money payments of rent will be governed by this standard. It is to be feared then in many instances the averages are calculated upon an erroneous principle: instead of dividing the total money amount of the sales made by the total number of quarters sold, the prices per qr. of the various sales are added together, and divided by the number of sales, which is a very imperfect mode of taking the averages." Now, sir, on behalf of the farmers of Hampshire, I can only say that if the Government will assist them in obtaining correct averages to regulate their money payments, they will render their best assistance to the Government in their efforts to secure correct returns of the produce of this kingdom. I believe that when tithes were first commuted, it was the intention of the Government that the averages should be regulated by the price at which the farmer might sell his produce; but it has been clearly proved in various discussions which I have attended, that the profits of trade have been allowed to have the effect of materially raising the averages. It is but equitable that our tithe rent-charges and money payments should be based strictly on the price at which we dispose of our produce. To insure this, I would suggest that the return should be made only on the first sale, which would exclude the profits of trade, and also the price of foreign produce. What would be the best mode of collecting the returns is a question which we must, of course, leave to the decision of the Government; but if they will condescend to consult us in the matter, we will give them the best advice that it is in our power to offer.

Mr. CARDWELL: Mr. Pile, you have been rendering good counsel and assistance to us in the experiments that we have been trying in Hampshire on the subject of agricultural statistics. I am very glad to see here a gentleman who has given such proofs of his zeal in the cause; and I shall be glad if you will continue what you were saying, and point out to me the mode in which you think your object may be best attained.

Mr. PILE: The view which I take of the matter sir is

this:—I think both the quantity and quality of all the corn grown and sold in this kingdom should be returned upon the first sale only by the seller and the buyer. I would endeavour to make the matter as easy as possible to the farmer. The resolution which we arrived at last night suggests a weekly return; but, knowing what I do of the habits of farmers, I am rather in favour of a monthly one. This is a matter which must, of course, be left for future consideration. I would recommend, however, that the return should be made on the first Tuesday in every month; that it should be sent, sealed, either to the clerk of the Board of Guardians in the several unions, with the names of the parties making it on the outside, or to the supervisor of excise in each district; and that, whoever might be the party to receive it, it should be forwarded to London unopened. I may remark that the farmers might be rather suspicious if clerks of the unions in the several counties, who are generally attorneys, had an opportunity of seeing the returns. They might think that that would operate injuriously to them; but, if the returns were sent to London before being opened, there could be no such objection.

Mr. CARDWELL: Well now, Mr. Pile, speaking on behalf of the Winchester Farmers' Club, would you propose that Parliament should pass a law by which it would be made penal for a producer to allow any grain to leave his premises without at the same time sending an accurate return to a public office? Should you be prepared for the enforcement of penalties in a case of that kind?

Mr. PILE: I should recommend it, but only on a small scale. If you imposed a high penalty, you would not get people to come forward to convict; and, on the other hand, the law cannot be carried out without some penalty.

Mr. CARDWELL: The object of having a penalty is, as you are aware, to secure the observance of the law. Now, are you prepared, on behalf of the farmers of Winchester, to recommend that every person who grows corn in this kingdom shall be subject to a penalty if he permits corn to leave his premises without at the same time sending to the Government an exact record of the transaction?

Mr. PILE: Yes, decidedly; a penalty of small amount.

Several other members of the deputation expressed their concurrence in this declaration.

Sir J. SHELLEY: I for one must say that I do not think that would be likely to go down in this country; and notwithstanding what has been said, I must, as a large farmer, protest against such an infringement on the liberty of the subject. I believe, however, that the difficulty might be got over in this way: Farmers, in general, would not object to the Government knowing the quantity of ground under wheat, barley, and oats in every union. That might be ascertained, without much trouble, through the boards of guardians and the relieving officers; and, when it is known what is about the average quantity of corn grown in each district, it will be easy for the Government to arrive at the average growth of corn without entering into any detail as to the grower. I am convinced that, if a penalty were enacted, there would be an outcry against it from one end of the country to the other. If farmers are compelled to make a return of all the corn which they sell, the next thing will be that every grocer will be required to make a return of all the tea that he sells. As I should protest against such an enactment in the House of Commons, were it proposed by the Government, I think it best to state my objection at once.

Mr. PILE: I only suggested the plan as being that which in

my opinion would give the least trouble to the farmer. If the Government will assist farmers in obtaining fair averages, I am convinced farmers will render every assistance to the Government.

Mr. SKELTON, from Lincolnshire, said: I rise, Sir, to take part in the proceedings, not only because I am a farmer and a member of the Club, but also because I am to a considerable extent a corn buyer. My own experience has been gained at Wisbeach, the leading corn market of perhaps one of the largest corn growing districts in the kingdom. You are well aware that at the time of the last harvest there was every appearance of the crop being short. As soon as that became known, the effect was great excitement in the corn market, and much speculation in corn. In the first four weeks after harvest, in 1853, one-half more was returned than in the corresponding period of 1852; in the first eight weeks after harvest there was a similar excess; and when I compared the returns of twelve weeks after harvest in the two years, I found the quantity returned equal—a striking proof that there was a great deal of irregularity in the returns. The quantity of corn delivered in the market in the first twelve weeks of 1853 was considerably less than in the first twelve weeks of 1852. The explanation is to be found, as I know from experience, in the excitement of the market, and in the amount of speculation which was carried on. I know three or four instances in which a cargo of wheat was bought and sold three or four times over, and each time there was an additional value of four, six, or even eight shillings per quarter. My experience of the first three months after harvest in the last year clearly shows that the returns were not made on the actual produce, but on the speculations of dealers. On examining the returns up to the end of the first sixteen weeks, I found a considerable decrease; in twenty weeks the aggregate quantity returned was, I found, one-third less in 1853 than in 1852; while in twenty-four weeks it was one-half less. It is evident that the returns were materially influenced as regards both quantity and price by speculative transactions; and when speculation ceased, as it naturally did when prices had reached a high point, the truth was soon discovered. I have thus given you a practical instance of the abuse to which the present imperfect system leads; and I think the plan suggested in the resolution which we adopted last night would be a great improvement on the present mode of proceeding. It has been tauntingly said that farmers generally are too inert, too indolent, and too careless in matters of this kind to make proper returns. I do not admit that: but if the present system has failed through non-attention on the part of those who ought to make returns, I think it would be only fair to give those who are not to blame in that respect an opportunity of obtaining what they require. I quite agree that every return should be faithfully made in the manner which you suggested yourself.

Mr. CARDWELL: Don't say in the manner that I suggested—it was suggested to me.

Mr. PILE: I would observe that every return should be made to the nearest inspector of corn returns, either by letter or by personal delivery. Returns should be made everywhere. At present there are only a certain number of towns from which any returns are made. There are many villages in rich corn growing districts where transactions take place without the parties going into the market; and, as the object is to get at the quantity and value of the produce of the whole kingdom, I think every man should be compelled to make a return; and with a penny postage it might easily be transmitted to the proper quarter.

Sir J. SHELLEY (to Mr. Cardwell): I do not think we need trouble you with any further observations. I am quite

sure you will agree with us, that the subject is well worthy of the consideration of the Government. I would merely add to the suggestions which have been made, that the return should not only state the quantity of corn sold by each person, but also whether or not he is the grower; in which case the same corn could not be returned twice over. Every one knows that a good sample of corn is sometimes sold by the grower under its value in the market; and that, after being first disposed of, it is sold again and again, and each time at a profit. My object is, that such corn should only be returned once; and what I suggest would remove any difficulty which might arise from the circumstance of the return being made only by the seller and the buyer.

Mr. CARDWELL: I can only say, gentlemen, before you leave, that I am exceedingly glad to have received so numerous and so influential a deputation of farmers on the subject of agricultural statistics. You know that we are extremely desirous to render as perfect as possible that branch of our knowledge; and we are so for this reason, amongst others, that, important as that kind of knowledge may be to the commercial part of the community, it is still more important to those who are themselves the producers of the commodity. In the commercial world people have means of their own of forming estimates and making calculations of probable profits; and certain and accurate information accessible to the producer of the commodity, and guiding him as to the price he ought to ask for it at a critical period of the year, would, as it appears to me, be of very great value. We are, therefore, endeavouring to secure the best agricultural statistics that we can. You probably know that in three counties in Scotland we have met with very general co-operation, and have been rewarded with considerable success; we are now trying the experiment in two English counties, Norfolk and Hampshire, the result of which I shall have officially before me in a short time. My knowledge at present is not derived from the official reports of the gentlemen who have conducted the inquiry. Well, now, you have justly said, that the two questions of the corn averages and agricultural statistics have an intimate relation with one another. I hope, therefore, that, having an anxiety on the one subject, you will use your influence to the utmost of your power to assist us in the inquiries and endeavours which we are making to perfect the other. Well, then, with regard to the collection of the corn averages, I am perfectly aware of the different objections which you have urged to the mode of taking the averages which is in operation at present. But the remedy which I think was suggested to me from Sussex last year, and which has to-day been suggested to me by Mr. Pile, who, as I have already noticed, has shown his sincerity in the cause of agricultural statistics in the course of the inquiry in Hampshire—that remedy, I say, involves the enactment of a highly penal law. You observe that you want the corn averages to be made correct, not merely for the general purposes of statistics, in order that, if we have returns at all, they may be accurate; but you want them to be correct because they virtually regulate transactions between private persons, because they govern the payments for tithes, and because in cases in which farms are let on corn rents, they govern the transactions between landlord and tenant. Now, of course, in any system which might be enacted by Parliament with that object, the tithe-owner and the landlord would expect to have some mode of forming their opinion as to the accuracy of the returns made by the producer. It would not, therefore, be desirable to have those returns made in so secret a mode that they would not be capable of local verification; for in that case they would obviously be open to reclamation on the part of

those who were on the other side of the transaction. When you recommend the Government, therefore, to pass a penal law prohibiting the farmer from sending any grain from his premises without giving such knowledge of all the particulars of the transaction as might be the subject of official record and local verification, you are making, on the part of the farmer, a very strong statement; and therefore, although it may be very interesting to me to hear your sentiments on a subject of this kind, I was not at all surprised that, in a deputation so numerous as this, a statement of that kind should elicit some difference of opinion. All I can say, in wishing you good morning, is that I am very glad to have received so numerous a deputation testifying an interest in agricultural statistics; and if by any mode which will really work smoothly throughout the country, and really carry along with

us the good feeling of the agricultural community, we can perfect agricultural statistics and improve the mode of taking the corn averages, I shall be extremely happy to be one of the instruments of carrying such a mechanism into operation. I think the first step will be that you, in your several districts, should co-operate with us, by voluntary efforts, to secure the accomplishment of this object.

Mr. HOBBS informed the right hon. gentleman that the subject of agricultural statistics was fixed for discussion by the Central Farmers' Club in March, and promised to forward to him a report of the discussion of the previous evening.

Mr. CARDWELL said he should be very happy to receive the report.

The deputation then withdrew.

ANNUAL DINNER OF THE DRIFFIELD FARMERS' CLUB.

The third annual dinner of the Driffield Farmers' Club took place in the Assembly Room, on Thursday, Feb. 2. About 90 of the members and friends sat down to an excellent dinner, provided by Mrs. Witty, of the Blue Bell Hotel. Mr. T. Hopper, the President, presided, and was supported on his right by the Hon. Capt. Duncombe, M.P., James Hall, Esq., and the Rev. R. C. Wilmont; and on his left by E. H. Reynard, Esq., the Rev. J. Blatchard, E. D. Conyers, Esq., H. Barkworth, Esq., and James Harrison, Esq. As soon as the cloth was drawn, Mr. F. C. Matthews, one of the honorary secretaries, read letters of excuse from Lord Lonsborough, Lord Hotham, Sir Tatton Sykes, Bart., Sir T. D. Legard, Bart., Sir H. Boynton, Bart., J. Dent, Esq., Colonel Grimston, and H. Woodall, Esq. A company of glee singers from Hull was present, and sang a variety of glees during the evening.

The CHAIRMAN having proposed, in succession, the usual loyal toasts,

JAMES HALL, Esq., next proposed the "East Riding Members" in very complimentary terms.

The Hon. Capt. DUNCOMBE returned thanks for the honour, and hoped to follow in the footsteps of his noble friend and coadjutor, Lord Hotham. He then referred to the rumour of Lord Lonsborough's intending to bring forward his son to represent the East Riding. With their kind support, he should be equally ready to fight the battle (applause). He blamed not the individual, who, having immense property in the East Riding, should naturally wish to see it represented. He hoped there was no one in that company, when that day should come, that would stand between landlord and tenant. Though he might be the sufferer, he would say—support the individual under whom they lived, if they could conscientiously do so. If he had the honour to be again elected, he intended to pursue the same course that he had done, and would represent them in a fearless and independent manner. On all future occasions, he hoped the same friendly feelings would exist amongst them.

JAMES HARRISON, Esq., proposed the "Landlords of the East Riding," coupling with the toast the name of Mr. Reynard. He greatly doubted that there could be found in any part of the kingdom a body so estimable as the landlords of the East Riding of Yorkshire. If he might select one as a pattern, it was Sir Tatton Sykes. He was not only a pattern for the East Riding, but for the whole kingdom. He only saw one present who came under the denomination. He hoped Mr. Reynard would live as long as Sir Tatton Sykes, and enjoy as large an estate (loud applause).

E. H. REYNARD, Esq., rose amidst rapturous applause. After that glorious wish of Mr. Harrison, he should be made of the hardest metal if he did not immediately jump up on his legs and reply to the toast. If he ever possessed the riches of Sir Tatton Sykes, he should dispense them properly, and for the benefit of the neighbourhood in which he lived. He was only a small landlord, and had not a great deal of wealth; but he hoped that he had a great deal of spirit (applause). As far as the little town of Driffield was concerned, they would never find him backward in coming forward; and whilst there was a shot in the locker it should never be begrudged. He hoped that he should never sully the bright name that he valued so highly (applause).

HAROLD BARKWORTH, Esq., proposed the "Tenant Farmers." He did not envy the man who could not number amongst his friends an English farmer; and there were many of those present whom he was happy to call his friends.

Mr. JOHN STAVELEY was called upon, and ably responded to the toast.

E. H. REYNARD, Esq., next proposed "The Driffield Farmers' Club." It was with feelings of peculiar satisfaction that he found himself the proposer of the toast. Had it not been for the Driffield Farmers' Club they would not have had that festive meeting; but that was of very small moment compared with the influence the club would have upon the neighbourhood. For years farmers had been taunted with dull stupidity, and told that they did not cultivate in the right way. But that club testified what could now be done by real practical farmers. Steam and railways were effecting wonders; education was now working its way. Liebig, Johnston, Nesbit, and other philosophers were at work for the farmers, and there was no reason why agriculture should not take its rank with the loom and the soil. About seventy years ago the farmers were happy-go-lucky fellows. If they had bad crops they never supposed it was from bad management (laughter). But now they knew what suited the different crops, and agriculture was become a science. Had any one at that period proposed that the Yorkshire Wold would seventy years hence be growing the finest crops and filling the Driffield market with such splendid stock, he would have been considered a fit subject for an asylum. Had one of these old gentlemen waked up, and seen his son open a parcel, take out an agricultural magazine, and read it, he would have cut him off with a shilling (laughter). The old woman would have said, "That lad will be a play actor." They could not spend too much

of their funds in reporting their proceedings, their lectures and discussions. It was only by promulgating what they did that the club was calculated to benefit the neighbourhood and the country at large. There was a nice, charming, little place called Burlington Quay, at which an excellent agricultural show had been held for many years. Encouraged by two or three successful exhibitions, Driffield felt that it was strong enough to have an agricultural show of its own. It seemed a very great pity that two towns so near each other should not be united. He would recommend—to use a fashionable word—that there should be a fusion of the two towns, and make the shows peripatetic.

Mr. W. ANGUS responded. No one took greater pleasure in the club than he did, and its success had been very satisfactory with so efficient a chairman and other officers. And they need not go beyond that table to form an estimate of its true character.

The Rev. R. C. WILMOT proposed "The Health of the President," as one of the best of tenant farmers, and of whom they had great reason to be proud.

The CHAIRMAN briefly replied.

E. H. REYNARD, Esq., proposed "The Health of the Vice-Presidents," to which

Mr. T. DAWSON replied.

Capt. DUNCOMBE, in proposing "The Health of the Treasurer," expressed his great desire to see the two societies of Burlington and Driffield amalgamated; and he hoped the arrangement would be effected in a business-like manner, by deputations from each society meeting and settling the matter, and not leaving it to paid secretaries and letter writers.

The TREASURER returned thanks.

Mr. J. BARUGH proposed "The Committee."

The Rev. J. BLANCHARD said, he had very great pleasure in proposing "The Health of the Secretaries." Mr. Wheatley was a good practical farmer, and Mr. Matthews was a most skilful agricultural manure manufacturer. He had been very much edified with a conversation held with Mr. Matthews, who had stated that he would make Mr. Reynard's land six times as good as it was. He replied, "If you can do that, Mr. Matthews, you will make Mr. Reynard what Mr. Harrison wishes him to be—as rich as Sir Tatton Sykes" (laughter).

Mr. J. WHEATLEY returned thanks for the honour conferred upon himself and Mr. Matthews. When he saw the progress which agriculture had made, with the evidence before them that the light of science had already developed some of the most hidden mysteries of the profession, and trusting in a further extension of knowledge, he looked forward to the day with exulting hope as to the result. It was his firm belief that the time was not far distant when the practice of agriculture would be no longer confined to a series of experiments, but eventually be based on the unerring principle of a known, acknowledged, and perfect science. Then would the skill and industry of the British farmers soon prove to this country their independence of foreign supplies for their food; and when that time should arrive, they might be assured that no small share of it was owing to the increase of agricultural knowledge through the agency of farmers' clubs. With a field so wide before them, and the rapid tide of improvement still carrying them on, let them entreat the landed proprietors to allow them to grasp at every improvement and try every new manure which science was daily bringing out, and not to covenant them to the mode of cultivation and kind of tillage to be applied, which too frequently fettered and tied the leading strings of the tenant, not only depriving him of the power of

exercising his own judgment, but too frequently laying down a course at variance with the interest of both landlord and tenant. With the present progress of agriculture, it must be considered vanity indeed of any person to lay down a regular course of cropping without destroying the interests of the tenant. If so, the land must go likewise. Both interests would go together. If the tenant farmed well for himself, the land would be improving at the same time. Let them ask for scope to be given to their intelligence and capital, and let them do their utmost in regard to cultivation, and especially implore the landed proprietors to take off that heavy burthen—their stringent covenants—and let them by their practice convince the landlords that they were deserving of the boon (cheers).

Mr. MATTHEWS, the other honorary secretary, having been loudly called for, said—After the able and eloquent manner his colleague and friend had responded to the toast, there was little or nothing left for him to say than to tender his best thanks for the very kind manner in which they had received the toast of The Secretaries. He might, however, say that as that society was formed to discuss matters connected with political affairs touching the agricultural interest, as well as introducing subjects for discussion on practical agriculture, he felt that he might say a word or two on the soil they cultivated and the crops they grew. To increase the fertility of the soil of this or any other country was a subject of vast national importance, a subject of great importance to our landowners, and a subject of such importance to the occupiers of the soil; and, as the wealth and the riches of this country proceeded from her soil, and as it supported the monarch on the throne as well as the poor in the cottage, did it not behove every one to endeavour to find out the elements which were necessary for each particular crop? He believed there was no doubt on the minds of agriculturists that there were certain elements which would produce an abundance of straw, however poor the soil might be. Was it not reasonable, then, to say that there were other elements which could produce the grain? and by blending or mixing these elements together, either chemically or mechanically, they had that which produced the staff of life in abundance. It was also of great importance, for the benefit of agriculture, to have all agricultural experiments carefully conducted. Let an acre of wheat be top-dressed with Peruvian guano, another acre adjoining with nitrate of soda, another with soot, another with ammonia phosphate, another with superphosphate of lime, and so on, leaving an acre undressed, and at harvest time let each experiment be cut, kept, thrashed, and measured separately; and afterwards compare the quantities and qualities of both straw and grain. He had no doubt they would find a difference in some of them that would surprise them. As he had the pleasure of addressing some of the best class farmers in England, he sincerely hoped that the few words that had just dropped from his lips would not be lost on some of his hearers. They might depend upon it that if this mode of farming were followed out, they would have a guide-post in every field with the finger pointing to plain truths (applause). He could not allow the opportunity to pass without tendering his best thanks to Mr. Reynard for his kindness in assisting him this season to carry out the view he had just stated; and he hoped that at their next anniversary Mr. Reynard would be able to tell them that there was a great difference both in the yield and quality of the experiments made (cheers).

HAROLD BARKWORTH, Esq., proposed "The Town and Trade of Driffield;" to which

JAMES HARRISON, Esq., responded.

Mr. G. HOPPER gave "James Hall, Esq., and the Holder-ness Fox-hunt;" to which

Mr. HALL replied.

Mr. J. STAVELEY proposed "The Labourers." It was their duty to do all in their power to promote their welfare by building them cottages, granting them garden allotments, and advance education amongst them; for he was convinced that his greatest trouble was with the more ignorant amongst them. The best treated were those from whom they received the best services.

Mr. J. WHEATLEY responded to the toast.

Mr. R. HOLTRY rose, amidst prolonged cheers, to propose "The Ladies," which was amiably responded to by Mr. W. TOPHAM.

The meeting broke up shortly after ten, after spending an evening of great social enjoyment and hilarity.

CLOVER-SICK LAND.

SIR,—A recent discussion at the Croydon Agricultural Club has conferred a deeper interest on this subject, which has proved a source of anxiety everywhere. It was then asserted by one of our first-rate farmers, that in the lands about this locality of East Surrey, a repetition of the clover crop could not be successfully attempted under a period of 7 or 8 years! Having long been aware of the fact existing generally, though admitting exceptions in respect to difference of time and soils, it appeared that I was called upon to look somewhat minutely into the circumstances of the case, and I therefore sought and obtained an interview with the party above referred to, and there, besides a confirmation of the leading fact as to time, I was assured that good cloverseed, rarely if ever failed to germinate in the first instance, whatever the nature or condition of the ground; and that on the headland of a field it might partially succeed, though on the broad surface of the plot it would entirely fail! Under circumstances so perplexing, what could I do, in order to point out any mode of inquiry which might perhaps cast a faint light upon a very dark and intricate position? Considering the question to be one of pure chemistry, I propose, first, that the new soil of any field devoted to a clover crop should, in the first instance, be searchingly tested, portion by portion, so as clearly to determine its organic elements so far as they may be soluble by digestion in distilled water, cold, and scalding hot; after which, the mineral constituents should be traced out by the processes of ordinary analysis. 2nd, Again, during the advance and growth of the clover, a similar course of experiments by distilled water might be followed up occasionally, till the plant begins to give out. So far, the investigation would tend to discover the loss or privation sustained by the earth from the absorbent powers of the clover; but there is a point worthy the most serious consideration, which has lately been passed over, in neglect. About 15 years ago, De Candolle announced his "Theory of Radical excretion," hoping thereby to explain the effects produced by a rotation of crops. He grasped at too much; but they erred more gravely, who at once condemned an hypothesis which they have utterly failed to subvert. Let any observant cultivator sow peas, beans, or other seeds of the leguminous and brassica tribes, in pots or boxes of simple loam for transplanting; and he cannot fail, while raising the young plants with a hand-fork, to detect a strong and specific odour which pervades the entire body of the earth. From whence has that been derived? Red clover is a legumen, and if a few young plants of it be transferred to bottles of distilled water (having been previously washed), I entertain but little doubt that after a few days, certain chemical tests, judiciously applied, will justify Liebig's assertion, that "fluid soluble substances are elimi-

nated by the roots of plants." The theory of excretion I held to be founded in fact, as alone capable of accounting for that poisoning of the soil which utterly prohibits the repetition of a crop, (whatever have been the quantity or character of manures interposed,) until some other plant shall have absorbed, and taken up the peccant matter which may have previously pervaded it.

Here I beg the readers who possess Morton's *Cyclopaedia of Agriculture*, to refer to vol. I, pp. 484-5, where there are two tables of the elements of clovers, which will be found very instructive.

J. TOWERS.

Croydon, Feb. 5th.

THE CLOVER FAILURE.

SIR,—The discussion of the Croydon Farmers' Club on clover-sickness, I see, has elicited two notices in the *Express* of the 30th January. That of "Enquire" adds nothing to our knowledge, except that the writer is not willing to impart his, without a valuable consideration, for which he will "demonstrate" to us "beyond the possibility of error, the true character and cause of clover-sickness;" does he mean the remedy as well? if he does, by taking out a patent, he may secure thousands of pounds instead of the hundreds he now requires for his secret.

Your other correspondent, Mr. Pridcaux, who seems at all times ready to impart his chemical knowledge bearing on agriculture—his is a valuable contribution, showing the fact of a successful application of manure. But Mr. Pridcaux does not state when it was applied; that is to say the time of year, which it would be desirable to know, as bearing on the question, whether it acted merely to increase the bulk of the clover like other manure, or, if it might be considered as furnishing a hint for the remedy sought; but no trial or experiment can lead to a satisfactory and conclusive result, except it be tried on land thoroughly "clover-sick." I hope the subject will not be suffered to drop without more contributions from observing practical men, of any striking facts and observations which may have occurred to them bearing on the subject, which may hereafter lead to special experiments and trials of different applications in the manner suggested in the report of the Croydon Farmers' Club. The observation that clover frequently flourished on the headlands, and some few yards' distance from the hedge, was corroborated by several members, but had not been noticed by one who farms open fields; it really seems very important to ascertain if the same has been noticed in other places, and whether in open fields, where there are no hedges, the headlands do, or do not, share the same fate as the rest of the fields; supposing there really is found to be such difference, it would very much narrow the enquiry; however, it is only by collecting the many observations of practical farmers from different localities, and comparing them with each other, and bearing in mind the known constituents of the different herbage and other plants, which may be seen at one view in the table published in the "Farmers' Almanac," page 93, that we can hope to arrive at any clue that will guide us to a satisfactory and successful result; and I am disposed to think we must set ourselves to the task by adopting what chemists term the synthetic method of experiment, rather than that of analysis, which we are not competent to carry out; the former we can do. Nature will play the part of operative chemist and carry on the experiment, and inform us if we have furnished the elements required, by producing the healthy clover plant we are in search of, on land tired of producing it previous to such application.

I am, Sir, your obedient servant,

Sanderstead, Feb. 8th.

W. STREETER.

THE ART OF COOKERY.—DOMESTIC SERVANTS.

Among the COMMON THINGS to the teaching of which public attention is now so strongly directed, it is to be hoped the art of cookery—one of the commonest, and yet apparently one of the most difficult and neglected of all—will not be forgotten. The instruction of the female peasantry in this useful art would be as advantageous to themselves when settled on their own hearths, as to the families of the middle classes, in which before marriage they officiate as domestic servants. Go where we may, we hear the universal cry of, What is to become of the “missuses”? Emigration and abundance of employment have given to the servants at home the upperhand as completely as if they were in Australia. On all sides we hear complaints of the difficulty of finding, and of retaining when found, a cook who can roast a leg of mutton and make batter-pudding or pea-soup. In these respects, those who advertise themselves as “professed” appear to be very little in advance of those who modestly designate themselves as “plain.” Power’s Irish cook, described by Mrs. Power in her “Memoirs of her Husband,” appears to have had the ambition of the former with the qualifications of the latter. Power was about to entertain a large party of distinguished guests, and his wife was giving instructions to Katty about the dinner, part of which was to consist of soup. “And what soup will it be, ma’am?” said Katty, duly impressed with the importance of the occasion; “will it be real turtle or mock-turtle?” “Neither the one nor the other,” said Mrs. Power, “but that soup I made yesterday.” “Soup, ma’am!” rejoined Katty; “sure that was not soup—was it? I took it for dirty water, and thrown it down the sink!” In point of fact, we have heard of ladies who have it in serious contemplation to dispense with servants altogether, as the least troublesome alternative. Without wishing matters carried quite so far, we are convinced that many of our fair friends would lose nothing, either in point of respectability or happiness, while they would add at least one-third to the effective incomes of their husbands, if they were to spend a little more time in their kitchens, superintending the preparation of the family dinner, instead of contenting themselves with ordering it—if, indeed, they condescend to do even that. The Lady Bountifuls of the last century ran into one extreme. They were mere cooks: they devoted all their time and attention to their gooseberry wine—their preserves, conserves, and reserves—neglecting mental cultivation altogether. Their sole literature was the

Family Recipe-book. Their great grand-daughters have run into the opposite extreme. They have deserted their kitchens, and have not substituted mental cultivation for cookery. We speak advisedly; for we cannot dignify with that name the waltzes and polkas, the novels, and Berlin wool, with which they vainly seek to beguile their listless hours. Some forty years back, ladies were driven to shoemaking as a fashionable way of killing time. The tools and instruction cost them ten pounds. The result was generally a pair, or at the most a pair and a half of ill-fitting shoes; and we have heard a lady of that period declare that her father had thanked her, over and over again, for the money she had saved him by *not* being her own shoemaker. Why not try a little cooking? Thanks to the modern stoves, with their nicely-arranged skellats and stew-pans, which science and mechanical skill have substituted for the blazing kitchen-hearth of other days, young ladies of the nineteenth century, just passing its prime, may cook without soiling their fingers or injuring their complexions. Were it not so, we would not recommend them to cook. We would rather live on bread and cheese all the days of our lives. It will be said, perhaps, that our notions with regard to female education and employment are too antiquated—that in these matters, as in everything else, a new era has dawned, and the solid course of instruction now given in colleges for ladies will be triumphantly appealed to. Granted: and when learning the long list of languages, dead as well as living, to say nothing of logic, ethics, and mathematics, which young ladies of eighteen are taught in those establishments for the moderate sum of thirty or forty pounds per annum, we wonder what Sir Roger de Coverley would have thought of it, who, in choosing a chaplain, stipulated against being insulted with Greek at his own table! How long would he have continued in love with the widow, had she understood that language? Ladies, however, who possess these solid acquirements—who, like Lady Jane Grey, prefer Plato to a pic-nic—will be least likely to neglect the economy of the kitchen. They will thoroughly understand the dignity of the employment, and call to mind all the poetry of cooking. To say nothing of the dinner which Milton describes Eve as preparing, when “on hospitable thoughts intent,” and his

“Herbs and other savoury messes,
Which neat-handed Phyllis dresses,”

there are the Homeric banquets, at which kings lite-

rally "killed their own meat," and at which even an Indian princesses turned the spit for the roasting, or drew the water and chopped wood for the boiling. Cooking is classical, and no lady will disdain to take part in it, who has read of these feasts in the original Greek. We trust, therefore, that in every College for Ladies there will be a Professor of Cookery, as well as of Chemistry, and that the matriculated students will be required to pass an examination in both. Let it be observed that it is the middle and working classes on whom we wish to urge the importance of the study. An earl's daughter can afford to be so ignorant of common things as not to be able to recognise chickens in a poultry-yard, because they do not run about with a liver under one wing and a gizzard under the other, though our modern poultry shows, it must be confessed, will tend much to dissipate this error. The honest farmer also was mistaken, though well meaning, who, intending to pay a high compliment to the beautiful Duchess of —, as she went bowing and smiling down the tables on one of the

public days at —, addressed her with "I need not ask your Grace who made the custards." It is a wonder her Grace, who was amused at the compliment, did not, for the sake of novelty, make a few custards. If she had done so, she would most certainly have been followed.

A knowledge, however, of the art of cooking is of more importance to the wives of the labouring population than to those of the middle classes, because it is the art, when properly cultivated, of making a little go a great way. A French army can subsist in a country where an English one would starve, and chiefly for this reason, that the French soldier can cook. The instruction of the female peasantry in cooking ought to be part of the education given in our village schools. The advantages of such knowledge to themselves, and the means by which it may be communicated, open a wide subject, which requires much consideration. We will think the matter over, and communicate the result of our thoughts on some future occasion.

THE CULTURE AND APPLICATION OF TARES.

There are several varieties of tares or vetches, commonly known—*i. e.* the winter tare, the spring tare, the large German tare, the wild tare, the yellow vetch, the bush vetch. The three latter kinds are perennials, and seldom cultivated in this country; the three former sorts are annuals, and are the kinds usually grown for their many very useful qualities. The autumnal or winter tare is the most hardy, and will generally abide a severe season in this climate: it differs from the summer tare in the smallness of its seeds, and the creeping nature of the plant, and is the only variety adapted for autumnal sowing. The summer tare is better suited for spring cultivation: the seeds are somewhat larger, and in their first stages of growth throw up a longer and straighter stem; and the plant itself continues to grow more upright, and less spreading than the winter variety. The large German tare mainly differs from the summer tare in the larger size of its seeds, and in the vigour of its growth: the stem and leaves are both larger than in either of the other kinds, and the fodder is coarser and more succulent. Much has been written and said about the distinctive habits of these latter sorts; but that they are the same species, and do not constitute botanical varieties, is, I believe, unquestionable: the difference in their habits has arisen from cultivation—from becoming acclimatized, or habituated to the climate; indeed, it is an ascertained fact, that the summer tare in having withstood a

tolerably severe winter will have acquired sufficient hardihood to become a winter variety.

The Mode of Culture.—This is very simple and easy. A suitable field or fields, or, if only required for limited use, a suitable plot of ground, being chosen (and which is generally some cleanly wheat-stubble field), it should be manured with ten cart-loads of good fold-yard dung per acre, ploughed about 4½ or 5 inches in depth, harrowed fine, and drilled with three bushels of seed per acre. If the soil is rich, or in good cultivation, the manuring may be dispensed with; but a top-dressing in the spring with guano or other fertilizing manure is very desirable, and is often attended with surprising benefit. The proper time for sowing winter tares is from the beginning of October to the middle of November: for summer tares from the first week in March till the end of June, according to their requirement for use.

The soils best adapted to the growth of tares are clayey loams, and clays of all consistencies; but they will grow well on almost any soil. On poor clay lands it is customary to sow tares in considerable breadths, and either feed them off with sheep, or mow them for summer soiling in fold-yards: this course is found to be an admirable preparation of the land for wheat. If properly grown, they form very nutritious food for all kinds of stock; and to secure this *proper growth*, it is desirable to have a succession for soiling, because if grown too luxuriantly—too big and coarse—the

food will be too strong for the stock, and cause scouring; or, if they are used before attaining sufficient maturity, the same effect will ensue: in any case where it appears the growth is too succulent, they ought to be mown some hours before they are given to the stock. This will give time for the watery particles to evaporate, and make the food much more palatable and digestible. In feeding off whole fields of tares, it is good practice to do it by folding; and upon the same principle, *i. e.*, to allow time for a sufficient nutritive growth: no fold should be stocked under one month's growth, and the field should be divided accordingly in proportion to the number of stock to be fed upon it, so as to allow every fold to attain its requisite age and strength. By pursuing this course the field will graze more stock, and they will thrive better than being allowed to range over it at pleasure. In mowing this crop for hay, it is requisite to allow it to grow till the flowers have for the most part become formed into pods, and in some that the seeds should be well formed. It is then ready for the scythe. As soon as convenient after mowing, it should be lifted carefully up, and shaken or parted so as to promote the speedy drying into hay. One, or at most two, turnings should suffice; otherwise the leaves will fall off, and a rather coarse strawy quality is the result. As soon as it is dry, it should be made into convenient cocks or heaps, containing about some half-dozen "forkfuls," and carted as quickly as possible. When well-made it is excellent fodder, and possesses more nutritive matter than hay or other herbage; but, if saturated with rain, it soon becomes very seriously affected, being more susceptible of injury from wet than any of the artificial grasses. The produce is frequently large, but generally coarse, and may average about three tons of hay per acre.

As a seed crop it is very precarious, frequently in heavy crops not yielding a return of the seed; and again, from 40 to 48 bushels have been obtained per acre. When mown for seed, it must stand till nearly all the pods are ripe, and then managed as the hay crop. The seed is chiefly used for sowing, but is

nearly equal to corn as food for horses, sheep, and pigs; and for pigeons and poultry it is highly prized.

In sowing a field of tares with the view of reaping the seed, a less seeding will suffice; nor must the land be rich, as too much herbage is detrimental to the seed crop. It is considered good practice to drill tares with the bean crop: they ripen together, and produce tare seed of very superior quality.

The tare is, perhaps, the most valuable for the general use of the farm of all the artificial grasses: the early mowings may be twice cut. Thus the produce is exceedingly great of green fodder. Cows yield more butter when fed upon tares than upon any other herbage. Horses thrive better upon them than upon clover or grasses, when properly applied. Cattle and sheep fatten faster upon the green fodder of the tare than upon any other grasses. For pigs this crop is almost invaluable, and they thrive well upon it without any additional food of a farinaceous character. It is also early in its habit of growth, and the winter variety is ready to cut before clover, and by a little attention the cultivator may so arrange as to have a regular succession of crop and cuttings from the autumn and spring sowings, of the most nutritious kind throughout the summer, upon which he may maintain much stock. Loudon says, "This plant maintains more stock than any other plant whatsoever." "Tares, if cut green," says Von Thaër, "draw no nourishment from the soil whatever; while made into hay they afford a fodder preferred by cattle to pea straw, and more nutritive than hay or any other herbage."

One word relative to their application to stock. If care is not taken, colic or other injury to the stomach will take place. All kinds of stock feed voraciously upon green tares, and this danger arises from overloading the stomach. When too succulent, or overcharged with wet, they should be mown early, and left awhile, as above named, or be mixed with straw or hay when given to the stock. Passing them through the cutting box thus mixed, and given as chaff, is a good practice.

LAW OF SETTLEMENT.

"The laws relating to the relief of the poor have of late undergone much salutary amendment; but there is one branch to which I earnestly direct your attention. The law of settlement impedes the freedom of labour; and if this restraint can with safety be relaxed, the workman may be enabled to increase the fruits of his industry, and the interests of capital and of labour will be more firmly united."

On Monday, the day immediately preceding

the opening of another Session, we thought it our duty to refer to some important points which the agriculturist might becomingly press upon the attention of the Legislature. Amongst those long calling for revision and amendment, we had necessarily to instance the individual hardship and general disadvantage consequent on the present action of pauper settlement. We make no claim to being in the confidence of the Govern-

ment, and we thus only spoke on our own experience of an evil everywhere apparent and as universally condemned. It is true, certainly, that one administration after another has openly admitted the ills of a system it would be impossible to advocate. They never, however, proceeded beyond this. Commissions of enquiry, petitions for alteration, complaints of injustice—all were received with the one convenient piece of easy sympathy, "that it was a very sad thing, no doubt,"—and there it ended. Our rulers were better employed. They were busily engaged in securing to those who most required them the blessings of an enlarged and liberal scale; and they gravely attempted to perfect this with the existence of an inconsistency as great and as self-evident as it is possible to imagine. They gave the labourer free-trade in bread, while they denied him free-trade in labour.

Hope deferred weakens the best of cases, and breaks down the boldest spirits. Never was there more unanimity evinced, never have all classes concerned tried to do more to free themselves from the effects of a gross wrong than have owner, occupier, and labourer in reference to this law of settlement. The argument was so strong, the example given in illustration carried with it such manifest conviction, that the most energetic tired at last of the repetition. They did so the more readily from there being no answer to what they advanced. A question debated without the presence of two sides to it cannot be expected to ensure any very lengthy or continual discussion. So has it been with the law of settlement. Men became weary of impressing a truism, and for the last year or two we have heard comparatively but little of the subject.

We confess, then, that it was with something like agreeable surprise that we found a matter demanding so much attention promising so soon to be attended to. There is no home topic introduced into that address which Her Majesty delivered to Parliament, that will be so heartily received as that we have quoted in the opening of this paper. We think we may say thus much for all classes; while we may add that if its purport be only properly carried out, none will bring with it so much good, or tend to confer so general a feeling of satisfaction and content.

It is impossible to calculate the injuries inflicted, and the ills arising from the working of the present law. Its direct effect is to hold the labourer in the light of a nuisance. We are taught by it to regard him simply as a necessary evil, and one that we owe it as duty to ourselves to lose no opportunity of getting free from. With so carefully devised an obstacle to all sympathy and association, "the improved condition of the labourer" has been very

like an impossibility. To improve the labourer, you should, in the first place, say good feeling and good sense, improve his dwelling. If you appeal to me, says the Law of Settlement, you should give him no dwelling at all. To improve the labourer, say the others again, you should elevate the tone of his mind, cultivate his moral character, and show him how much in common are his interests and your own. If you ask me, says the Law of Settlement, don't trouble yourself to do anything of the sort—the less you see or hear of him after his work is done, the better. To improve the condition of the labourer, it is further urged, you should improve his skill and strengthen his powers, getting a good day's work for a good day's wages. The Law of Settlement advises you to do no such thing—take as much out of him, and pay him as little as possible; and then, when he is prematurely worn out—what is it to you? His settlement is in another parish.

It is time, indeed, that such a state of things as this was altered. We repeat, that out of the House all are alike anxious for the remedy. We have only now to hope that it may be bold enough to be effective. The honourable gentleman who seconded the address in the Commons—Mr. Hankey—"believed that great and important alterations were to be introduced;" and he significantly adds, "as they ought to have been long since." In fact, almost every one who has yet referred to this paragraph in the royal speech has done so with the fullest approval of its object. Lord Ducie, who was selected to second the address in the Lords, spoke evidently from his heart when he said—

"He was at a loss adequately to express how much gratification he felt at the contemplated revision of the law of settlement, which, as it at present stood, opposed a serious obstacle to such of the working classes as wished to change their residence, and carry their labour to a new market; and he trusted that the result of any change that might be made would be to elevate the character of the labouring people, and engender an increased feeling of independence among them."

Another noble lord, whose name does not appear in all the reports, was equally ready to declare his approbation of this intention on the part of the Government. His support must have the more weight, coming as it does from the opposition benches, as well as from the long attention he has himself given to the subject, and the laudable efforts he has individually made to reform the abuse. The speaker here was Lord Berners—a name that may rank well by the side of Lord Ducie, either as a friend to the cause, or himself with the authority of a practical agriculturist. The only expression to be found in any way unfavour-

able to the contemplated alteration and amendment came from the late Premier, Lord Derby, who "d—d with very faint praise." His Lordship "hoped the solution of the question might be found more easy than it had hitherto been supposed to be;" while he "did not hesitate to admit the evils which are inseparable from the existing law of settlement."

The more credit, surely, then, to those who dare meet these difficulties. If there be evils, as it appears there are, it is our duty to at least endeavour to remove them. Our own opinion is, that these difficulties will be found by no means so insuperable as may have been expected. We believe rather, on the other hand, that every one will gladly reconcile himself to any temporary inconvenience that may attend the introduction of a measure that should be productive of so much advantage. We will do the Government the justice to believe that it will be as good as its word.

We may, perhaps, have been thought somewhat premature in giving the Government that credit for good intention we already have done. The reference made in her Majesty's opening address to the serious evils of the Law of Settlement, and the measure proposed for meeting them, was received in some certain quarters as little more than a piece of attractive clap-trap that would end much where it began. We have even thus early in the Session some tolerably good assurance to the contrary. Whatever may be the result—however great the difficulties and prejudices to be encountered—there is no question but the promise given has been amply fulfilled by those who proffered it. The country has now to consider whether it will take this opportunity of subduing a monster with the influence of which it has been oppressed so long, but that so few hitherto have dared to face.

With the many demands on our columns, we fear we cannot this week give at that length we could wish the speech with which Mr. Baines brought forward this matter of pauper settlement on Friday evening. The question itself would well have warranted our so doing—the manner in which it was treated, still more so. It is seldom, indeed, that we have seen a man so thoroughly master of his subject, or making his conclusions with so much judgment and discretion, as distinguished the progress of Mr. Baines' address upon this occasion. Well canvassed as the topic already has been, one cannot but admire the effective clearness with which the case was made out, and its importance pressed upon the attention of the House.

In thanking the honourable gentleman in the name of the agriculturists of this country for this effort, no less indeed on their behalf than that of the people generally, we shall proceed to show

cause why we take upon ourselves to do so. A few extracts from the speech may be the most acceptable proof we can offer. In the first place, as to the evil in a national point of view:—

"His belief, after looking most carefully and anxiously into the subject, was, that there was no one class of the community which was not prejudiced to a greater or less extent by the existing law. With the permission of the House he would draw their attention to its effect upon that most important relation of all—the relation between the employer and the labourer. By the operation of the present law of settlement a great many labourers were kept in their own parishes, instead of going to other parishes where they would be able to obtain remunerative work. Cases frequently happened which he would illustrate by a supposition which, he had no doubt, had been exemplified within the knowledge of many honourable gentlemen."

This supposition brings the matter more immediately home to our own readers; how few would be prepared to dispute its correctness!—

"A farmer was in want of a labourer; two men presented themselves to him. One of them was an idle, worthless, slovenly labourer, but a settled inhabitant of the farmer's parish; the other was an industrious, sober, skilful man, a non-settled inhabitant of the parish. Now, what were they to think of a state of the law which actually made the farmer take the worthless labourer and reject the good one? Yet that was the case. The farmer reasoned with himself in this manner:—'This idle, worthless man will do some work, to be sure; he is settled in my parish; if he goes into the workhouse I shall have to maintain him and his wife and family; therefore the best thing I can do will be to give him some kind of job out of the workhouse, and put up with him, instead of taking the more skilful man.' Now this system operated, in the first place, to give the farmer an inferior kind of labour. As this was the case in thousands of parishes, what an effect it must have upon the productive agricultural industry of the country!"

We referred last week to the manner in which the moral character of the labourer must suffer from the action of the present law. Mr. Baines thus alludes to the same consequence—

"The system must also have a most pernicious effect in the way of example upon the character of the labourer. What could they think of a system of law which taught the idle and unskilful labourer to rely upon the accident of being settled in a parish instead of upon his sobriety and skill, and which discouraged these characteristics in the man who possessed them? When they remembered that these cases might be numbered by hundreds and by thousands, he left the House to imagine what the aggregate effect must be upon the productive industry of the country and the character of the labourers."

He quotes Mr. A'Beckett, one of the commissioners in the inquiry of 1848, on this point—

"It is almost impossible to imagine the misery, dirt, degradation, and consequent immorality, in which a large portion of the labouring classes of this country are at the present moment living. If it can be shown, as I believe it can, that much of this moral and physical abasement is caused by the operation of the existing law of settlement and poor removal, the necessity for an immediate alteration of the law will be admitted on all hands. In almost every union where the course

of my inquiry has taken me, I have found some one or more densely populated parishes in the neighbourhood of others very thinly inhabited by labourers, and in some instances having scarcely any cottages at all. In the former the dwellings are for the most part wretched, damp, unwholesome, inconvenient, excessively high-rented, and crowded with inmates to such an extent as to render it impossible that health or comfort could be enjoyed, or the commonest rules of decency observed. It is the general result of my inquiries on this head that the labouring classes are to a great extent demoralized and deprived of domestic comfort by the inducement offered to owners of property in close parishes to clear their estates of cottage habitations—an inducement for which the present law of settlement and removal of the poor must be held chiefly, if not entirely responsible."

Further on we come to that monstrous inconsistency of which we wrote last week—"They gave the labourer free trade in bread, while they denied him free trade in labour." Mr. Baines' views on this point are very much in unison with our own:—

"Under such a system neither capital nor labour in this country could be said to meet with its just return. He had seen petitions presented to that house from the farming districts, especially since the repeal of the corn laws, complaining of the hardship that, while farmers were exposed to unrestricted competition with respect to the commodity in which they dealt, they should not have the advantage of free trade in labour. He thought their complaint was most reasonable, and that it beloveth the Legislature to consider how the grievance might be remedied. The only commodity the labourer possessed was his labour; and could it be said that he enjoyed free trade when he could not take that labour to the best market, but was obliged to remain in his own parish?"

The climax of the evil, the gross absurdity of perpetuating the present system, comes in the benefit we derive from it. After all this careful forethought in driving out the labourer like a leper from amongst us; after exercising all our ingenuity to prevent a settlement, and so save a few shillings in the maintenance of a man whose best energies may have been devoted to our service; after all this curious trouble, what do we really gain or save by it?

"Another great evil of the existing system was the enormous amount of money annually wasted in the litigation arising out of removals, a waste of which the ratepayers had most grave cause to complain. The law on this subject was the most complicated, the most obscure, the most unsatisfactory that had ever been devised; there were no fewer than 40 statutes on the subject, while, as to the adjudged cases, they were to be counted by thousands, and of such a nature as to make confusion worse confounded. Yet such was the law, and such the decisions which the Poor Law overseers were to construe and administer as it were in dealing with the unfortunate paupers."

We will not stay here to further dilate, as Mr. Baines very ably does, on the palpable loss—or, to use a common phrase, "what is taken out" of a man from having to walk daily three or four miles to his work. Let us rather conclude our summary with the remedy advised. It is acknowledged to be adapted from the recommendation of the Com-

mittee of 1847, who thought, as it was desirable to extend the area of the poor rates, that the unions would form the best limit for that purpose. Mr. Baines is also of this opinion:—

"For, although those unions differed in extent, some being larger and some smaller than others, still they were nearly of the same size, and at all events there were no such monstrous discrepancies in size as existed among the parishes. He considered that the area of the unions would be more advantageous than a wider area. It was an area next in degree to that of parishes, and he was of opinion that it was not desirable to extend the area too much, as it was of the utmost importance that ratepayers should look after every case of distress which came before them."

If we recollect rightly, Mr. Chadwick and some of those he consulted went beyond this in their anxiety for a remedy. Certain of the Farmers' Clubs, we believe, passed resolutions in favour of national rating. We are not yet to come to this. "Such a scheme," it appears, "would be totally inconsistent with the present proposal, *which recognized in the fullest possible way the expediency of preserving the system of local self-government.*"

"There were, he (Mr. Baines) was well aware, some well-meaning persons out of that house who would go further than he felt inclined to do, and who were in favour of a system of national rating, or even to having recourse to the consolidated fund for the relief of the poor; but he begged to state that he entertained the most insuperable objections to such a proceeding. It was his firm conviction that any such scheme must inevitably lead to fraud and jobbery of the very worst description. Such a scheme would lead to the greatest wastefulness and carelessness. The direct effect of it would be to bring about such a degree of pauperism as no man would ever be able to get rid of."

The proposed measure was very well received in the House: if not with general approval, still with every promise of being fairly considered. It is, too, naturally occupying much attention out of doors, and many of our contemporaries are now devoting their columns to the subject. In our Paper of to-day will be found a by no means partial article from *The Times* upon it, as well as the first of a series of letters from our correspondent, F. R. S. The former of these is, if anything, rather prone to find fault with Mr. Baines and his proposition, although one of the gravest of the charges hinted at is on the score of humanity. Admit this alteration to Union rating, and then, says *The Times*, "prima facie, it is not very humane to carry off a poor old man to a Union workhouse ten miles off, and compel him to end his days amongst strangers, in confinement and all sorts of dreariness and discomfort." Concurring as we often have occasion to do with so high an authority, we confess that we can hardly do so here. For our own part we really cannot see what possible difference this alteration would cause. As the case now stands, the poor old man, if he goes to

any workhouse at all, must go to the *Union* workhouse, and end his days quite as much amongst strangers. Let us hear one word more from Mr. A'Beckett on this plea of humanity—

“Another process to which he would solicit the attention of the House was the hardships involved in the removal itself. Let the House consider what that removal was to the unfortunate pauper, transferred—forcibly removed, if necessary—under a justice's warrant, from, in many cases, one end of the kingdom to the other. He was removed in all probability from a place where he had formed attachments, connexions, an occupation, to a place where he was altogether unknown—for he might be removed by reason of the birth settlement, 60 or 70 years before, of his father or his grandfather to a place where he had no chance of the employment to which he had been accustomed

all his life, and where, consequently, his only prospect was pauperism for life and the communication of the taint of hereditary pauperism to his children.”

Difficulties, no doubt, and some serious ones, are associated with the adjustment of this matter. We must repeat, however, that the attempt to grapple with them is worthy of all consideration and encouragement. In the words of an honourable member on the Opposition benches—Sir John Pakington—we “think that her Majesty's Government have done well in calling attention to the question, and we hope that the subject will be gone into with an anxious desire to aid and assist Government.”

ON THE COMPARATIVE POWERS OF THE HORSE.

SIR,—If a man were to go to the butcher with the idea of purchasing a leg of mutton for sixpence per pound, at which price he might have obtained it some months ago, he would find that he could not procure the joint, and would be obliged either to increase the sum or content himself with an inferior part. The purchaser of horses at the present crisis is in precisely the same predicament. Not that the butchers' meat has deteriorated in quality; neither has the horse; but the enhancement which has taken place in the value of those commodities justifies the sellers in demanding more money. Till within the last twelve or eighteen months, horses have been procurable for useful purposes at prices varying from twenty-five to fifty pounds; in which class may be enumerated, those calculated to mount our cavalry regiments; like every other kind of farming stock, their value has risen; and unless it again recedes purchasers must meet the times, like the man who requires a leg of mutton, and pay more money or put up with an inferior article. Government are in precisely the same position as the ordinary purchaser. To expect that farmers will devote their attention specifically to breeding horses for the service, at the maximum price of £40 for the household troops, down to 25 guineas for the light dragoon regiments, is out of the question. They would not be remunerated; and as the kind of horse required commands more money for other purposes, it is quite obvious that some alternative must be adopted; what that alternative must be, requires no comment. A gentleman who has taken great pains to write upon the subject, invokes government to encourage a superior breed of horses, both for ordinary purposes and that of mounting the cavalry, by offering prizes or bounties for horses bred exclusively to run long distances, and gravely asserts that the quality of our national breed has so fallen off that good horses are not procurable upon any terms. On the fallacy of such theories, many strong arguments may be established. In the first place, such a project would not enable the breeder to realize a profit at the existing scale of prices, and animals of character will always command their value in the market; therefore, the regiments

would not be supplied. This writer does not attempt to offer any hints to breeders of horses, how they can rear them at less cost; but very ingeniously endeavours to inculcate an impression that the horses of the present day are inferior to those of our ancestors, in stoutness or endurance to run a distance, in constitutional stamina, soundness of limb, capability of carrying weight, and bearing fatigue. In illustration of his argument, he mentions the performance of a horse called Black Chance, which commenced running in the year 1737, being then five years old; but his account is full of incongruities. He observes, in that year, the horse won a plate at Durham, and another at York. In 1738, five plates are enumerated as having been won, all “in the course of one season; every race four miles, and every race contested. In 1739, he seems to have won twice.” In 1740, he states that “Black Chance won at Wrexham, at Shrewsbury, and at Oswestry, carrying thirteen stones; he won at Deubigh, at Chester, and won at Manchester. In 1744, he walked over for the annual plate at Farndon.” He then adds, “It does not appear whether this horse ran in 1738; but if he did, he was running and winning, carrying twelve stones. He won, in short, every time he started in this year. In 1741, he won at Chester, at Manchester, and at Hereford. In 1742, he received a £15 premium, seven years consecutively.” Altogether, it is a very curious account, inasmuch as a doubt is expressed whether the horse ran in 1738, after having mentioned that he won five plates. By comparing this with the “*Racing Calendar*,” it will be seen that the horse's performances are correctly given to the end of 1739, except that he was beaten once in that year. In 1740, he won at Wrexham, at Oswestry, where he carried eleven stone instead of thirteen, at Shrewsbury, Denbigh, Tamworth, and Warwick. In 1741, he won at Chester, Manchester, Tamworth, and Hereford, and was beaten at Gloucester by Sedbury. In 1742, he won at Manchester, the only time of his starting that year, but he received £15 at Chester to withdraw; not seven years consecutively. In 1744, he walked over for the annual prizes at Farndon, and was beaten by Rib,

at Chester. In 1745, he won at Chester; and finished his racing career in 1746 by winning twice at Farndon, and being beaten at Chester, where he fell lame. He won and received on twenty-five events, and was beaten four times. By this it will be seen that the horse's performances were better than what his partisan accords to him; but as I shall proceed to show that we have had horses of recent date, whose performances were far superior, it is necessary to consider them accurately. Winning and losing races, walks over included, he ran over 180 miles. The same gentleman introduces the performances of the Carlisle gelding, which horse commenced running in 1719, being then six years old; he states, "he had no rival in carrying all degrees of weight, in supporting heats, travelling, and constant running, and this maintained to an age seldom heard of." Without intending to detract from the just merit of so good an animal as the Carlisle gelding, or any of the other worthies of olden times, yet it is necessary, when drawing a comparison between their performances and those of horses of recent times, to take all circumstances into consideration. On searching the Racing Calendar, I find the Carlisle gelding won twenty-three races, walked over twice, received forfeit twice, paid forfeit once, and was beaten nine times; besides which, he ran for selling stakes on several occasions, at various prices, from £80 to £20. So much for a horse which had no rival. To win the aforesaid races, he ran altogether 160 $\frac{3}{4}$ miles, and in those which he was beaten 68 miles, making a total of 228 $\frac{3}{4}$ miles. He concluded his racing in 1731, but did not run in 1720, 1725, or 1726.

In 1819, we find Euphrates ran for the Hampton Court Stakes at Newmarket, being then what was called two years old, as horses at that period took their ages from the 1st of May; his last race was in 1828, and during his career he won forty-two races, going over a distance of 153 $\frac{3}{4}$ miles; he was beaten on fifty-seven occasions, in which he ran 154 $\frac{1}{2}$ miles, making in all, ninety-nine races, and a total of 308 $\frac{1}{4}$ miles; exceeding that of Black Chance by nearly one-half, and that of the Carlisle gelding, in the aggregate, nearly one-third. Catharina was the victor of seven-nine events, to accomplish which, she went over 300 miles of ground. She was beaten on ninety-eight occasions; and adding all the distances together over which she ran, amount to 583 miles. Her commencement was in 1832, when only two years old, and she continued on the turf ten years. She frequently carried 12 stone and upwards, and won a match at York carrying 14 stone. When these performances are contrasted with those of the ancient worthies, we must not be told that they were so stout as the present generation—Liston, Clothworker, Beeswing, and many others might be added as examples. Gamer blood never flowed in the veins of any horses than that of Doctor Syntax, Venison, Hero, Sir Hercules and his descendant Irish Birdcatcher, Reveller, Lanercost, Pantaloon, and many others of modern times; and although the price generally excludes farmers from acquiring their services, and some of them are dead, still it is their blood, directly or collaterally, which is dispersed through the country, much of which is procurable at a moderate charge. Our

present breed of race-horses has been stigmatized by the assertion that they are bred in and in; we will therefore take a few examples to prove to what extent that allegation is correct. At Dudding Hill stud farm, within five miles of London, there are six thorough-bred stallions, whose pedigrees will dispel the erroneous impression. Epirus (own brother to Elis, winner of the St. Leger), was by Langar, out of Olympia, by Sir Oliver, her dam Scotilla, by Anvil, out of Scots, by Eclipse, Herod, &c. Langar, by Selim, dam by Walton, grandam Young Giantess, by Diomed, out of Giantess, by Matchem; Selim, by Buzzard, dam by Alexander, her dam by Highflyer; Buzzard by Woodpecker; Sir Oliver by Sir Peter; The next horse is Harkaway; he was by Economist, out of a Nabockish mare, her dam Miss Tooley, by Teddy the Grinder, out of Lady Jane, by Sir Peter; Economist, by Whisker, out of Floranthe, by Octavian, her dam, Caprice, by Anvil, out of Madcap, by Eclipse; Whisker, by Whalebone, out of Penelope, by Trumpator; Teddy the Grinder, by Asparagus. The pedigree of Lothario is as follows: he was by Giovanni, out of Moggy, by Sultan, her dam Active, by Partisan, out of Eleanor, by Whisker; Giovanni, by Filho, dam by Don Juan, out of Moll in the Wad, by Hambletonian; Filho, by Haphazard, out of Mrs. Barnet, by Waxy, her dam by Woodpecker. Here we have one of the nicest horses imaginable to produce hunters, and riding horses, from suitable mares; not only is his symmetry and action perfect, but he is descended from parents of faultless make. The other horses are the Libel, Kremlin, and Retriever, and their pedigrees are equally free from incestuous contamination. Most of the horses of the present day are quite as free, which the "Stud Book" proves. Unfortunately for those who adopt the argument that our present breed of horses has degenerated, compared with those of our ancestors, in consequence of being bred in and in, having demonstrated that such an assertion is incorrect, I will now proceed to show that many of those of olden times were bred incestuously. Rachel, foaled in 1763, the dam of Mark Antony, and the celebrated Highflyer, was got by Blank, her dam by Regulus; Blank and Regulus were both by the Godolphin Arabian. The Carlisle gelding aforesaid, eulogized for his stoutness and superiority over his compeers, was got by the Bald Galloway, his dam by Lord Carlisle's Turk, grandam by the Bald Galloway. If that is not incestuous, we must crave a definition of the term. As it has been declared by the same writer, that "the breeders of cattle and sheep well understand the necessity of carefully avoiding incestuous breeding," I must introduce an example to show how greatly he is mistaken on that point. At the sale of the late Earl Ducie's short-horns, which took place in August last, a white heifer, only five months old, called Duchess 69, realized the enormous sum of 400 guineas; her sire was the Fourth Duke of York, her dam, Duchess 59, by the Second Duke of York, grandam, Duchess 56, by Second Duke of Northumberland. The Fourth Duke of York was by the Second Duke of York, consequently, the sire and dam of the heifer were both by the same bull; that is breeding in and in, with a

vengeance! But most of the short-horns which realize such extraordinary prices are bred after a similar custom; I can by no means acknowledge this to be judicious, but such is the fashion of the present day. In breeding horses, it cannot be too strongly condemned. The currently expressed opinion that the existing conditions of racing are conducive to the production of weedy stock, must not be taken in an abstract sense. Handicaps certainly afford opportunities of winning with inferior animals, and thus there is encouragement to breed a greater number; but every breeder is anxious to rear the best horse in his power, and for that purpose selects the blood which in his judgment he conceives most likely to accomplish that end. The combinations of speed, endurance and soundness, are as essential to constitute an animal of value as ever they were, and are as much sought for.

Reverting to the proposal that government should offer prizes to induce persons to breed horses of a superior description, to maintain and increase our national character; there are several insurmountable impediments, exclusive of the one which I have already advanced as regards profit to the farmers. Even supposing such a scheme were to be adopted by government, it would require six years before the new style of horse could be produced for any prizes that might be offered. Allowing only three years more for their average continuance on the turf, would involve a period of nine years, and five more before the progeny could be brought into the market; such an expedient is not feasible. If the test of constitution and soundness is decided by running distances, which I do not acknowledge to the full acceptance of the theory, we have steeplechases in abundance, to put it to the most severe proof. Without seeking any assistance from government, the public subscribe ample funds to induce persons to breed horses capable of running long distances, under the most trying and distressing circumstances. Callous must be the human heart which would desire to impose on the noble horse tasks of greater punishment. Steeple-chasing has been in fashion twenty years; and therefore if any stimulus of the kind could be the means of improving the breed of horses, it has been in effect. As the Arab blood is mentioned as the proper cross to improve our present breed, I should like much to see a horse with that strain, running for one of the great steeple-chase engagements. Many very erroneous impressions exist respecting the usages or manner of running adopted by our forefathers. When their horses ran their four-mile heats, they did not go their best pace throughout, any more than they do at the present day. They went at a moderate pace part of the distance, and I very much doubt whether the majority

of the races which were run for in 1753 were so well calculated to try the lasting powers, as many of the races which were run in 1853. Take the great handicaps as a specimen, for most of which the pace is good throughout—evidently made so by those receiving great allowances of weight. Greater importance is attached to the performances of horses in olden times than they were entitled to. In the early days of racing at Newmarket, the four miles was run over the Round Course; for it is not till the year 1735 that the Beacon Course is mentioned, and it was over the former course that the races were run. The B. C. is 4 miles 1 furlong 133 yards, and it would have been inconvenient to have walked the horses back that distance from the winning to the starting post, between the heats. To substantiate my remark that the horses in ancient times did not generally make severe running from end to end, I quote from the preface to the first volume of the "Racing Calendar" abridged, which furnishes an extract from the Duke of Tuscany's travels in England, dated May 9th 1699, in the reign of Charles II. After giving a humorous description of Newmarket Heath, and of his Majesty having amused himself with seeing my Lord Blandford and my Lord Germain play at bowls, with a brief account how the horses were prepared for running, the Duke continues—"Two horses only started on this occasion, one belonging to Bernard Howard, of Norfolk, and the other to Sir — Elliott. They left Newmarket, saddled in a very simple and light manner, after the English fashion, led by the hand at a slow pace by the men who were to ride them, dressed in taffeta of different colours, that of Howard being white, and that of Elliot green. When they reached the place where they were to start, they mounted, and loosening the reins, let the horses go, keeping then in at the beginning, that they might not be too eager at first setting off, and their strength fail them in consequence at the more important part of the race, and the farther they advanced in the course, the more they urged them to continue it at full speed. When they came to the station where the King and the Duke of York, with some lords and gentlemen of his Majesty's court, were waiting on horseback till they should pass the latter set off after them at the utmost speed, which was scarcely inferior to that of the race horses." This affords incontestible proof that the horses of that day did not finish their races at a very extraordinary pace.

In future communications I will endeavour to describe the means which every breeder may avail himself of, in order to produce horses which may be reasonably expected to possess the smallest share of imperfections and infirmities. I am, Sir, yours most obediently,

Cecil.

RESOURCES FOR BREEDING HORSES.

Sir,—Having in a previous communication shown that our horses have not deteriorated in respect to blood and performances, I will now proceed to consider how their superiority may be continued, confining my observations to those subjects which apply to breeding

hunters, roadsters, and carriage horses. For these purposes, but especially for the two former classes, recourse must be had to stallions which have been bred for the turf; and although it is not imperative, or in all cases advisable, that the mare should be thorough-bred, it is

essential that the sire should be. Here, however, I must introduce the suggestion, that there can be no objection to a powerful short-legged thorough-bred mare with hunting action, if such an animal can be obtained at a reasonable price. Breeders of all kinds of animals are aware that when a cross of what may be termed plebeian blood is resorted to, the stain should be in the dam, and that the male should be of the higher class. The superiority of the progeny arising from this system was clearly demonstrated some years since, when cocktails were in fashion for racing. Those were found to be most superior which were the produce of half-bred mares and thorough-bred stallions. Hunters to command high prices must possess speed and action to go over a country, as well as endurance; it is therefore highly necessary to study every circumstance which will conduce to those perfections. It will be found that many of the most highly-celebrated horses on the turf, and those also which are the sires of the best race-horses, have not always been the most successful as the progenitors of hunters and roadsters. This is a fortunate circumstance for breeders, because the high price at which the services of those horses are usually obtained places them above the limits of prudent economy. Several reasons may be assigned for this peculiarity; the lengthy action which contributes to the acmé of speed for racing differs from that which is to be coveted in a hunter requiring lasting powers, with great quickness, elasticity, and command of stride which enables him to go in a deep country; for let it be remembered there are many very fair horses on the turf which would be beaten by first-rate hunters over a holding fallow. It is the latter capability which contributes to the perfection of a hunter. In hacks, light showy action enhances their value; but it is not in general the distinguishing property of our best race-horses; moreover, the legs of some of them are not calculated for either hunters, hacks, or carriage-horses. Bay Middleton and his descendants are conspicuous for this failing, which, being decidedly hereditary, should always be regarded with caution. Many stallions which never produced a horse worthy of the name of a racer, have been particularly successful as the progenitors of hunters. Fyldener may be introduced as an example; Master Henry as another. Manfred likewise got a number of active, nice-shaped horses, but a little uncertain in their tempers. Spectre was also the sire of many good hunters and some very clever hacks. Belzoni also signalized himself as the sire of hunters highly valued in Leicestershire. Mares descended from such horses are particularly desirable for the purpose of breeding. I have lately seen some very promising young hunters by Foxbury, and Testator is in great favour. The stallions to be selected should be those with good legs and feet, sound constitutions, strong backs and loins, with prominent hips, muscular thighs, and perfectly defined hocks; the shoulders being so intimately connected with the action of the fore-legs, demand the most positive scrutiny, and temper is an attribute not to be disregarded. Colour may also be a consideration—not forgetting to ascertain what may have prevailed among the ancestors. A horse that has signalized himself by winning his races when the ground has been

deep, is greatly to be preferred, for the purpose now under consideration, to one which could only run when the course was dry, although the former may not have won more than two or three races during his career, and the latter twenty. This circumstance will generally influence the breeders of racing stock, who selecting the one which has won the most races, and beaten the most superior competitors, leaves the other at the service of those who confine their breeding to less aristocratic pretensions. Perhaps it may be observed that there are very few stallions in which are combined all the good qualities I have enumerated; but there are some: they should be extensively patronized, and that would be the best security against their being sent abroad. It is too frequently the parsimonious saving of breeders which leads to that event. While in every department of a breeding establishment it is necessary to practise economy in the true acceptance of the term, it is equally important to avoid penurious extremes, which must eventually lead to disappointment and loss. Every man should determine upon giving a fair price for a fair commodity; and as every man who breeds hunters expects to realize a good price for a good horse, he should not be niggardly of the sum which he pays for the services of that animal which is to be the progenitor of his future hope. Rather than expend three sovereigns for the services of a superior stallion, many persons will put their mares to any wretch, if the owner will accommodate them for a mere nominal remuneration. This is the frequent cause of useful horses being sent out of the country. It cannot be expected that the owner of a valuable animal will refuse the offer of a high price from a foreigner, unless he can fairly calculate upon realizing an equivalent sum by keeping his horse at home. To secure stallions of repute, farmers would find it advantageous if they would unite, and signify their determination to patronise those of character. An extra sovereign or two is of no importance to an individual, more especially when he reasonably anticipates a return of his money; but when a number of persons contribute their one or two sovereigns, it becomes an object of great importance to the recipient. The introduction of Arabian blood has been recommended, as calculated to correct the evils which are alleged against the horses of the present day. The argument held is, that in "the early days of racing the large importations of good Arabs—followed as they were by a careful and continuous selection, not for one good quality, but for a fine union of qualities—succeeded for many years in producing, both for the turf and all useful and pleasurable purposes, the best saddle-horses in the world." I have clearly shown that the horses of the present day are far superior to those of the time referred to. Going back to Arabian blood would be like putting a child back to his alphabet after he had gained proficiency in spelling. The advocate of the Arabian states that "most of the Arab horses which have of late years come to this country have not been of the first class;" and also that "they can only run at their full stretch for about half a mile." There is no doubt that the horses that have been imported have been the best that could be produced; and

the fact of their not being able to run more than half a mile is an admission that our race-horses are far superior to them in running distances. Apart from racing, for hunting purposes a cross from the Arab is worthless, which I have seen in several instances. Animals bred in that manner are proverbially soft, and of delicate constitutions. For breeding hacks, if they are only to be required for parade, selecting very handsome Galloway mares about fourteen hands high, the services of a clever Arabian may be admitted, but for no other kind of horse.

If it is desired to breed large powerful carriage horses, a very active short-legged Cleveland horse may be most suitable; but he should be one of extraordinary perfection.

Unfortunately, many persons who enter into the speculation of breeding are not sufficiently good judges of the points and merits of horses, and thus they are often led into the error of putting their mares to unsuitable stallions at a low price. Not being able to distinguish the difference of blood, constitution, shape, and action between the one whose covering price is three sovereigns and the other whose price is one sovereign, they only regard the saving of their money, without reference to future prospects. It is to be hoped the Royal Agricultural Society will take the subject into consideration; they have it in their power to advance the interests of breeds of horses very materially; and I doubt whether it can be done more effectually than by offering liberal prizes for the produce of certain stallions which, having been exhibited, shall be approved by the judges. It would be a means of assisting inexperienced breeders in their selections. They would naturally send their mares to those stallions, in the hope of gaining the prizes for their produce; but it should be a condition that the stallion so chosen should be restricted to covering mares not thorough-bred for a certain sum, I think not exceeding three sovereigns. Comparing the value of the prizes offered by the Royal Agricultural Society—when the meeting took place at Gloucester—for other kinds of farming stock with those for horses, especially of the roadster class, it would appear that such animals are considered unworthy of encouragement. For three different breeds of bulls £10 each were given; but for the best roadster stallion only £15. Young bulls, cows, and heifers in milk or in calf, and yearling heifers of the three kinds, were liberally rewarded with prizes, and likewise old and young stallions, fillies, and brood mares and foals for agricultural purposes; but there was not one prize for young stallions, fillies, or brood mares of the roadster class, which, if judiciously managed, is the most profitable stock a farmer can raise.

The next consideration—and that is a most essential one—is the method of keeping foals after weaning them; it is a rock upon which so many breeders have foundered. Having weaned their foals, they consider nothing more is necessary for them but grass, and that at a time of year when it is sour and contains very little nutriment. On the importance of this subject, I make an extract from a letter by a friend, who heard that I had very recently visited a breeding es-

tablishment which some years since was in very high repute. To give additional weight to the remark, I must state that my friend is a member of the Veterinary College, and for thirty-seven years had the superintendence of the first stud in England. He writes —“ From ignorance in forming the plan, the grass is now so rank and sour that there are complaints of worms, &c., instead of praising, as was formerly the case, the keep of the paddocks.” Much of the success or disappointment attendant on breeding horses turns upon the choice of appropriate food, which requires occasionally to be varied. The growth of animals, the development of muscles, and the texture of bones and sinews, depend greatly upon the food with which they are supplied. I am not about to recommend such nutriment as may be conducive to the production of fat, but such as will supply the blood with the elements of muscle, bone, and sinew; for these are the substances which render the horse valuable. To this purpose a moderate allowance of corn and hay is imperative. First-rate hunters and hacks cannot be reared without it. The proportions may vary, as the constitutions of all animals are not alike, and circumstances will sometimes produce unexpected changes. It is in the judicious observance of these matters that the talent of the breeder is exemplified, and his success will to a great extent depend upon his discrimination. When a horse appears too fat, it is a certain indication that the food which he receives abounds in particles having the property of forming that substance; in which case it should be changed, and the quantity diminished.

In some cases it will happen that a horse does not generate a sufficiency of fat, for a certain portion is as necessary to health as an overabundance is prejudicial. This may arise from indispotion, the bad quality of the food, or its not being suitable to the constitution. If indispotion be the cause, the nature of the complaint should be ascertained, and suitable remedies administered. Should it be decided that the quality of the food is bad, the alternative is obvious. Relaxation of the bowels will cause horses to lose their flesh; and so will the opposite condition—constipation. These complaints will frequently have their origin from the food not being suitable to the constitution, and therefore a change is necessary. These may be considered trifles; but when it is observed that relaxation of the bowels, and also constipation, in foals and young horses, if neglected, often becomes constitutional, that impression must cease. In the management of thorough-bred stock, every effort is exerted by giving them good food to bring them forward, so that they may run at two years old. It would be out of character, on this occasion, to enter into any arguments for or against the practice of running them at such an early age; but I may remark that every farmer is aware of the profit and advantages of making his oxen and his sheep ready for the butcher at the earliest period possible; and that is accomplished by selecting those breeds which are celebrated for the purpose, and supplying them at an early age with suitable food. By judicious treatment the horse may likewise be brought forward in his stamina and condition, by which means a

four-years-old will be as forward as a five-years-old that has been neglected, and this may be termed the economy of breeding. To explain myself more clearly, we will suppose two colts are taken from their dams in October: one shall have two feeds of corn per diem, a bran mash once a-week, and occasionally a few swedes, according to the state of the bowels, four or five pounds of hay, a small paddock or yard to run into, with a hovel for shelter at night and when the weather is unfavourable; the other to be turned into a meadow where the grass is up to his knees, but which is necessarily sour, containing very little nourishment, and which will probably engender worms. When frost and snow commence, he will be accommodated with an asylum in the farm-yard, where he will be driven about by the cows, perchance gored by their horns when picking a mouthful of barley straw or indifferent hay from the cribs which the jealous cows aforesaid wisely consider their just and exclusive prerogative. In March or April this colt is probably allowed the range of some meadow or pasture land, when, by meeting the young grass as it springs, he occasions damage to the future crop, and the succulent herbage relaxes his bowels. In May he appears a poor, weakly, mis-shapen, dejected object, pot-bellied, and looking as if he had been starved, which, in point of fact, is nearly true, although he has eaten or destroyed keep which might have been more profitably consumed in other ways. Now let us consider the one which has been properly treated: he will be found to look kind and healthy; having been sheltered from the elements, he will be robust, and exhibit a fair proportion of muscle, and he will be playful and full of spirits. But, then, the opponents to this course will exclaim, he has cost so much more to keep him. Let us therefore ascertain to what extent. From October the 15th to May the 13th is thirty weeks. Two feeds of corn per diem, or a bushel per week, at three shillings, amounts to £4 10s., at which price they may be bought, although when consuming the produce off the land on the farm, it ought only to be estimated at the cost of growing it. Half-a-hundred weight of hay per week, at £3 per ton, £2 5s. Bran mashes and swedes, 5s.: in all, £7. The valuable manure that will be made is equivalent to the extra attendance. The half-starved animal will consume or waste more hay; but we will estimate at the same amount—£2. The injury that he will do to the spring grass by meeting the keep and poaching the land cannot be valued at less than 10s.: total, £2 10s., making a difference of £4 10s. But what would be the relative value of the two animals if offered for sale? much more than the difference in the keep. To sell at this early age, however, is not the object; it has therefore to be considered which will make the most valuable horse at four or five-years-old—one which has had every opportunity for establishing a healthy, vigorous constitution, or one which having been badly kept in its youth will grow up to be a puny, badly-shaped, infirm animal. It is the latter mode of rearing them which produces so many horses of little value, and which has led to the impression, that the breed of saddle horses has deteriorated. We have plenty of good material to work upon, if that

material is properly manufactured. A superficial observer comes to the conclusion, when he visits a large fair, that there are very few good horses to be met with, because all the rubbish is taken to that market; but those which have been more judiciously managed by breeders who have acquired fame, are eagerly sought for by dealers and others, who go to the farms where they are bred, and there make their purchases. Those horses are never seen in the public fairs at all.

There are so many little items connected with rearing horses which may appear trivial in detail, yet are collectively important, that it becomes necessary to mention some of the most essential. When a foal is taken from its dam, the loss it sustains from being deprived of its mother's milk is considerable; that must be met by offering nourishing food, consisting of oats, which should be bruised, occasionally bran mashes; the addition of a little boiled linseed in the water is highly beneficial. As it is used on many farms for feeding fat stock and other cattle, there cannot be much trouble or expense in supplying the small portion requisite to the young foals. Shelter is of great consequence at all seasons, especially during the fall of rain. The texture of the coats of young horses is of that nature, that when it once becomes wet it is a long time getting dry again, more especially in the winter season. During the process of drying, the evaporation which takes place very materially reduces the quantity of nutriment contained in the blood destined to form fat and muscle on the growing frame, and thus much of the benefit to be expected from the food which the animal consumes is wasted. Colds taken at an early age are calculated to injure the constitutions of young horses to a considerable extent. Some persons urge that horses should be brought up without attention to such matters, in order to render them hardy; but a moment's reflection will decide which of the two is most likely to constitute an animal which, having arrived at maturity, is required to be in possession of his physical powers in the utmost state of development—one which has enjoyed uninterrupted health, or one which has been constantly in a state bordering upon disease. Although colds may be slight, when frequently repeated they become constitutional. Settling upon the lungs, they are often the origin of cutaneous disorders, swelled legs, blindness, and general debility. That organ being the medium through which the vital principle of the air is conveyed to the blood, its pure and healthy state, and consequently the general vigour of the animal, must be affected more or less by the condition of the lungs. When the trachea or windpipe is attacked by colds, and the membrane with which it is lined becomes inflamed, roaring is a frequent result; but it is a mistaken notion to suppose that malady ever proceeds from the lungs. Strangles, and the epidemic called "influenza," often occasion roaring, but more especially when the membrane lining the windpipe has become the seat of chronic inflammation produced by colds.

As I would urgently recommend that all horses should be sheltered from the inclemency of the elements, so would I as earnestly recommend that they should be allowed the free-enjoyment of pure air when the weather

permits; but for this purpose they should not be turned into wet foggy meadows, where the grass is rank and luxuriant. Small paddocks or yards are the most suitable during winter, or a dry upland pasture that has

been eaten close by sheep; but the existing conveniences must in some measure regulate this event.

I am, Sir, yours most obediently,

Cecil.

FARM HORSES.

SIR,—No show of animals since the institution of the Royal English Agricultural Society, or perhaps no exhibition that has ever taken place in Britain, has proved half so useful as the show at Gloucester, in bringing under review, not the excellencies of the horses for competition, but the bad parts of every kind, for censure and reprobation. With the exception of the Suffolk horses, which gained the prize—and they were not faultless—no such motley multitude of farm-horses has ever been submitted to public inspection; and the general notice of visitors has not failed to record its opinion in the many essays on the subject in the columns of the press. Alluvial counties, as is mostly the county of Gloucester, with the adjoining districts, always produce a heavy succulent herbage, which rear dull, gross animals of every kind. The old idea yet lingers in a very large existence, that weight of leg and body constitute strength, and that heavy lands cannot be cultivated without the sluggish action of lumbering carcasses, which correspond with the soil in the weight and the dull inertness. Hence the continuation of the heavy horse of Lincolnshire, and the many modifications which constitute the farm horses of the midland counties, and the greater part of the Gloucester show.

It is not for a moment entertained on the subject of farm horses that substance must be banished—on the contrary, it is essential to any character of the kind, but the weight must consist in the length of carcass, and depth of the hind-quarters, in the deep and capacious chest, and conical rise of the withers; in the round barrel, lightening gradually to the flank, with a long neck and arched crest. Along with the form that denotes physical power, a draught horse must possess length and depth of posterior extremities, with the form of shoulder that will allow a freedom of step and a lengthened progress. A length of parts denotes action, and for this purpose a very considerable relaxation may be allowed, from the closeness of the rib to the hook-bone, commonly called being “well ribbed home.” If the ribs be lengthy and well curved, a laxity may be allowed in this respect.

The light-bred horse of Yorkshire, the Cleveland bays, and their allied congeners, are no doubt well adapted for all turnip lands, in the lightness of action and quickness of step. But on clay soils that are fallowed for wheat, the temper of the animal is much too impatient, it frets and chafes during the autumnal softness of the land, and the working becomes disagreeable. The step is too quick to be sustained by the power of the animal in the case of clay lands, which require an enduring strength, along with an evenly-

moderated action. Of this quality, the writer of this notice had a most satisfactory proof, on the Shale coal clays of South Northumberland, where the bay horses of Yorkshire were brought into a fair competition with the breeds of the country, and the former failed in every working value. On turnip lands, the relative properties will be more evenly balanced. The tillage of these clay soils is within the power of two moderate-sized active horses; the horse of Yorkshire possesses spirit without substance, and a failure is inevitable.

Between the fiery and disagreeable extreme of the Yorkshire horse, and slow lumbering pace of the Lincolnshire black horse and its modifications, the Clydesdale horse of Scotland steps in, to constitute by far the most useful animal for the farm that is possessed by any portion of the British Islands: they possess strength for heavy weight, and have spirit and muscular power to put their strength into action. These two requisites constitute a perfect animal for farming purposes. They are stronger than the Suffolks and Clevelands, and much more hardy than these breeds of horses, and in quickness and regularity of step are unequalled. No horse in Europe is able to draw such loads single yoked, and for days together, the pace is slow, medium rate, or quick, as the purpose may require, and as the animal is treated. In farming, the power is equal to any reasonable purpose, and for the turnip-drill the pace is quickened to any use, and is steadily sustained by the spirit and muscular action, without the chafing and fretful unsteadiness of the light animal of Yorkshire. No other horse in Britain has these powers in unison.

It has been objected that there is no uniform colour by which to distinguish this most useful breed of farm horses. This want is supplied by a uniformity of points of excellence, which exist in a much larger variety of colours than is tolerated by the judgment of an amateur. The black and grey are the most fashionable colours, with some white on the face and hind-legs. With a knowledge of the points of excellence, and of this so-far uniformity of colour, little difficulty occurs in selecting the Clydesdale horse.

The breeding of animals that are fattened has been pushed in refinement beyond the proper degree of substance, and the power of propagation; so working horses may be refined beyond strength and power into useless spirit and unavailing exertion.

Thus shows are useful in two ways—to bring forward good parts to be rewarded, and to exhibit bad parts for reprobation.

J. D.

IS IT POSSIBLE TO OVERDRAIN LAND?

Is it possible to overdrain land? All draining engineers of the present day, and, we believe, the majority of the most enlightened farmers, will answer this question in the negative, as regards arable land. With respect to grass land, there is as much difference of opinion on this subject among draining authorities as there is respecting the proper depth, distance, and direction of drains. Smith, of Deanston, was a shallow drainer. He acquired celebrity with drains only 2½ feet deep. When Parkes had given popularity to drains of 5 and 6 feet, Smith still argued in favour of his own 2½ feet drains, but modified his practice to 3 and 3½ feet, which those who profess to be his disciples have increased to 4 and 4½ feet. We have heard him contend that there was no arable land, however dry, which would not derive benefit from being drained, except alluvial flats; and, as proof of the possibility of overdraining them when under arable culture, he instanced the Lincolnshire fens as yielding superior crops of grain in a dry season—we think it was 1844—where the water level had not been reduced below 3 feet. He appealed also to the necessity which is found to exist in that district, of introducing the water into the ditches in the summer, when the situation of the land below the level of the rivers permits it to be done. Among modern draining engineers, much difference of opinion prevails on this point, as regards pasture land, or rather mowing grounds, and peaty soils. Mr. Parkes—but we only know his opinions at second-hand—contends, we are told, for deep drains on all soils and under all circumstances. We have heard another draining engineer, who enjoys considerable celebrity, declare that he would travel a hundred miles to see an over-drained meadow. The quantity of hay, he said, might be diminished, but the quality would be improved; and he clinched the argument by his usual *ultima ratio*—a bet. We knew him to be a wise man, or we should have been reminded of the celebrated axiom in Hudibras, of the mental qualifications of those who for arguments use wagers. We heard, at the same after-dinner discussion, the opposite opinion maintained by one whose celebrity in the same profession is equally great. In support of his views, he appealed to the general experience of “practical farmers,” though by no means inclined to bow to their experience and authority with regard to the advantage of draining land across the fall of the surface instead of along it. An eminent gardener was present, who contended

that, with garden crops, no detriment, but the contrary, is found to result from the reduction of the water-table to four feet from the surface. The engineer cited the case of the gardens about Bermondsey and Deptford. It had often struck us, in passing them, that they were suffering from insufficient drainage—the water standing in the ditches within 2 feet or 1½ feet of the surface. We had imagined, in our simplicity, that the cultivators of those grounds accept this as an accomplished fact, a necessity, from which there is no escape; and we had supposed that it is merely by means of the lavish supplies of the richest London manure which they enjoy, that they overcome the difficulty against which they are thus obliged to contend. Our friend, however, assured us that they prefer the conditions under which they are placed, and would deprecate nothing so much as the draining of their land. It was rejoined, on the other side, that theirs is an exceptional case; that their crops are chiefly of a succulent kind, requiring large supplies of moisture—among which celery, by nature a marsh plant, holds a prominent place; and that the soil, moreover, is of that almost peaty kind, which most of those who contend against the possibility of over-draining admit to be of the exceptional character. We took another view of the question. We knew the contiguity of these garden grounds to Plumstead marshes; we knew that the majority of the owners and occupiers of those marshes are enemies to draining, or, at least, hold that the benefits to be derived from it are of so equivocal a kind, that, if they are to be drained at all, it is chiefly on sanitary grounds that the draining is necessary, and therefore that the work ought to be undertaken at the expense of others rather than of themselves. We know that opinions are contagious, and thought they might have extended from the farmers to the gardeners. We know, moreover, that among the farmers who occupy those marshes, there are some—and those by no means the least successful cultivators—who hold the opposite opinion, who have underdrained their land as deeply as the present outfall will permit, and who would drain it deeper if they had the opportunity. The current of opinion among the tenants of alluvial tracts, which are chiefly under grass, runs, as far as our information goes, in favour of the possibility of overdraining; but we are not quite sure that they belong to that class of farmers whose opinions are to be implicitly received; they belong too often to the stand-still,

do-nothing order. Alluvial tracts are generally rich; they yield spontaneously a large produce; and it is not in such districts that the best farming is usually found. The occupiers of such tracts generally content themselves with collecting, with the least possible trouble and outlay, the natural produce of the soil. We have not in our eye the Welsh farmer of such land, who remarked to a neighbouring landowner, "Upon my word, Mr. Outfall, the new agents will spoil all our land; we shall have no rushes to thatch with;" neither have we in our eye another Welsh farmer, who, on being asked why he did not drain his farm—and there never was a farm which required it more—replied, "If the Almighty had intended it to be dry, it would have been drained by nature." We allude to the occupiers of alluvial tracts in England—in counties where the farming is not considered to be below par, but in which the neglected state of the marsh land, rich though it generally is, exhibits a lamentable contrast to the energy displayed in the improvement of the poorer uplands. Towards the close of the discussion a proposition was advanced, which appeared intended, like some of the diplomatic notes of which we have heard so much of late, to reconcile the conflicting views of all parties. It was to this effect—that draining is

imperfect, unless accompanied by irrigation; that we ought, by draining, to remove surplus water during the winter, and to have the power of restoring moisture in the summer. For ourselves, we took little part in the discussion, maintaining a discreet silence, or only observing, with Sir Roger de Coverley, that there is a great deal to be said on both sides.

We have, however, considerable doubts of the truth of the proposition advanced, as we have stated, for the purpose of effecting a compromise between two opposite opinions. We doubt whether it is necessary to have recourse to the double and expensive process of deep draining, followed by irrigation. We doubt whether there may not be a certain medium depth of drain, dependent of course on the nature of the soil and subsoil, which will remove the excess of moisture in wet weather, as from a sponge saturated with water, and yet retain, like a damp sponge, sufficient moisture for the purposes of vegetation in dry weather.

In this respect, as in most others in which vegetation is concerned, we cannot do better than take lessons from nature, by the observation of those fertile soils which enjoy the happy medium, and yield the most abundant crops without requiring either to be drained or irrigated.

DISEASE OF TURNIPS.—INVESTIGATION OF THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

There is much obscurity in the question of the diseases of plants. The principles of treating the maladies of animals seem to be much better understood. We can hardly point to half-a-dozen diseases of plants for which anything like a specific is known. If we except the smut, which may clearly be prevented—and even infected seed may be cured without any great difficulty—we hardly know where to go to find another which can be treated with similar facility, or on which any assumed remedy will have much impression. Who can cure mildew? or ergot? or curl? Three years' experience will not enable the husbandman to cure the disease of the vine, any more than three times that period will teach a successful method of averting the disease of the potato; or than as many more will enable the gardener to stop the canker in his apple trees.

We either know far too little, or we are not acquainted with modes of investigating vegetable structures with the same precision as we are of the animal economy; or we are less disposed to take the trouble in the one case than the other.

Everybody's business is nobody's. An ox or a horse, a pig or a sheep, is an animal, which belongs to some one who sets about its cure. An epidemic amongst plants affects only one in a mass. It is usually spread over a vast extent of country, and there is a great number of sufferers. As republics and corporations have divided responsibility—have no common conscience—many things can be done and suffered, and again undone, which any one individual of the body corporate would shrink from; so any wide-spread epidemic, such as the diseases of plants usually assume, is the business of men who are incapable or unwilling to make the necessary investigations.

We need not go to the new disease of turnips, to which we last week alluded, for any confirmation of this, nor to any distant historical fact to quote an example of its accuracy. The disease of forty years' standing amongst our valuable turnips, and the investigation of the Highland and Agricultural Society of Scotland made during the year just past into its causes and cure, are amongst the melancholy instances of the utter worthlessness of

some of the ill-considered investigations which are often made even with the sanction of high apparent authority.

Dr. Anderson, who has written a paper in the Society's transactions, gives us at the outset to understand we are not to expect much from the investigation. He says "I confess it was with no very sanguine expectations that I undertook the enquiry." He went on, but soon found he had very little to communicate; for "when the inquiry had advanced some length, it became apparent that the *only method* likely to be attended with success was to conjoin the chemical with a practical enquiry, and to obtain from persons most conversant with the phenomena of the disease such information as their experience enabled them to supply."

Here no doubt a great mistake was committed. Instead of a running commentary made up in the laboratory on certain experiences, it would have been far more philosophical and far more satisfactory if the simple mode had been adopted of making a set of well-arranged experiments with a view of obtaining a little evidence negative or positive: one step, indeed, on which some reliance could be placed. A different course, however, is taken. They issue a list of 22 queries to practical men—we know not to how many, but a large number. Disaster seems to attend the very initiatory step. "Notwithstanding the large number of these schedules that were circulated, comparatively few of them were returned filled." And to complete all, these came in a most contradictory manner. As regards the very outset of the enquiry, the kind of turnips most liable to the disease, a large number say the white globes, some say the yellows, some say the swedes; while others say the swedes do not suffer at all, and a large number more just declared that all kinds suffer alike.

As to the time of sowing, there is the same sad disagreement. Some declare early sowing is favourable to the development of the disease, others say late, while a considerable number of the reporters have observed no difference whatever.

As to the very vital question, whether insects are a cause or an effect of the disease, there is equal uncertainty. Some say worms, others grubs, some centipedes are present, but only in advanced states of the disease; while others, and those we think the majority, assert that there were no insects present. Some again declare they are there before the disease begins to make its appearance.

As to the cure, one might have thought the practical men would have been much nearer agreement. The editor of the report says, "The evidence on this point is very contradictory, one part of the reporters stating that it (lime) at once puts a stop to the disease, the remainder, though the smaller number, having found no effect from it."

Without ringing the changes on the subject in an indefinite degree, we may observe that the drainage of the soil is equally praised and blamed for the disease; and the reporter is bound to say of the whole affair, in other words, that it is a great failure. "It is very difficult," he says, "to deduce from among these conflicting statements any conclusion which can be considered altogether beyond cavil;" and he ends with declaring the information obtained as being "valuable as suggesting matter of enquiry," and will say that "nothing would be more satisfactory, both to the Society and to himself individually, than to obtain the results of further *careful* inquiries on the parts of its members."

The most successful method had clearly been omitted. No experiment was made; in all the cases of varied soils and climates, not a single instance had been selected to undertake an investigation beforehand.

We have hitherto omitted his chemical analyses of sound and diseased turnips, and of soils liable to and free from the disease: on these we shall enter in a future paper; but it would have been very satisfactory if the evidence collated had been made the means of suggesting what kind of experiments were to be made in reference to the further pursuit of the enquiry.

Professor Johnston, in his valuable work entitled "Experimental Agriculture," did in 1849 lay down certain rules of enquiry on the subject, and it would have been much more satisfactory if these suggestions had been adopted by the Society before they issued their circular. They exist at page 249 of that work, and it may not be amiss to know that they tend to the points. 1. Whether a large dose of lime, say 100 to 200 bushels per acre, would cure the disease; 2. Whether autumnal or spring applications are most desirable; and 3. Whether soils where the disease has made its appearance are poor in lime. The latter is the only one of the three enquiries made by proper experiment, and upon these we shall afterwards have occasion for observation.

It was a remark as poetical as it was erudite that animal and vegetable organism was a struggle between vitality and chemistry, and that death was the victory of chemistry. Vitality, in its laws; its manifestations, and its modifications of chemical action, renders the different steps in the struggle difficult to determine with any great degree of precision. The laboratory does not always reveal the secrets of chemico-vitalism. Analysis will sometimes no more determine a question in an organized structure than synthesis will form an animal and a plant. The chemist can decompose, can separate, can determine the various elements; but he can

often no more derive any practical lesson from this fact, than he can add all together and make again the vitalized machine he separated.

Never was chemical analysis more at fault than in the researches of the Highland and Agricultural Society of Scotland on the fingers-and-toes in turnips, to which we last week alluded. If the practical enquiry was contradictory and unsatisfactory, the chemical investigation was equally barren.

Dr. Anderson analyzed soils from more than one district, where sound and unsound turnips were grown; he analyzed sound and diseased bulbs, both as regards organic and inorganic combinations.

The result of all his investigations he thus sums up: "It is unquestionable that the disease is not due to any chemical change in the composition of the soil—the disease is not dependent on any chemical change having taken place in the plant itself; that, as far as can be at present seen, the most probable explanation is that which attributes the disease to the attacks of insects." These are abbreviations of the conclusion he draws from the whole investigation; but he confesses "it is very difficult to deduce from among these conflicting statements any conclusions which can be considered altogether beyond cavil."

Now without the slightest disposition to cavil, to raise any captious or frivolous objection to the conclusions of the examiner, we must say we cannot see fair ground for any one of the conclusions he thus draws from his facts. We will take, for instance, one of his analyses of the soils. The first given is that of Mr. Robertson of Lady Rig, and the following is the result.

	Soil in which sound turnips were found.	Soil in which unsound turnips were found.
Insoluble silicates	87.89	87.88
Soluble silica	0.07	0.05
Peroxide of iron	2.94	2.75
Alumina	1.59	1.28
Lime	0.38	0.32
Magnesia	0.13	0.55
Potash	0.14	0.20
Chloride of sodium	0.10	0.06
Sulphuric acid	0.05	0.03
Phosphoric acid	0.04	0.16
Organic matter	4.66	4.55
Water	1.75	2.09
	<hr/>	<hr/>
	99.75	99.93

The others are very much on all fours with this. The Doctor says, nothing can be deduced from these as to the peculiarities of the soil having anything to do with the disease; the results are so close that "the quantities of the constituents are quite within the limits of error in such analysis." The only difference noticeable is, that potash and phosphoric acid

are more abundant in the soil where the diseased than where the healthy plants grow.

Now it is just possible that the examiner might not find out what he wanted, from the fact that he did not know what to look for. We remember some analyses of limestones once given, where all the constituents were accounted for, as to weight; but phosphoric acid, which it contained, was not found, nor sulphuric, because they were not looked for. Now, suppose the examiner knew by previous experiment what to look for; suppose the Highland and Agricultural Society of Scotland had set about, by means of its reports or its members, a series of experiments made for the purpose of ascertaining either positive or negative facts, the chemist might not have been thus led to scramble in the dark, and say the soils are so much alike that no conclusion can be drawn. Suppose, for instance, the cause of disease was due to the absence of some caustic alkali; or, in other words, it was due to the condition rather than the quantity of mineral ingredients in the soil, he had no indication of the necessity of the enquiry. Again, suppose it were just the contrary.

The Doctor makes out that the liming of the land sometimes answers and sometimes does not; he finds also that the lime must be applied some time before the turnips are sown—these are indications, at least, that lime has something to do with the disease, in a manner either direct or indirect, and yet he does not determine the state of the lime in the soil as caustic or carbonate. He does not refer to the difference in the two soils of chloride of sodium, though the difference of that is greater than of the phosphoric or sulphuric acid, to which he does allude; and his subsequent experiments show this to be very important, because the main observable difference between diseased and healthy bulbs is in this very ingredient, except in water, arising probably from the decomposed state of the bulb, irrespective of organic constituents.

Taking the results, as calculated, apart from sand, charcoal, and carbonic acid, we have, in the three comparative analyses mentioned, the following results as regards chloride of sodium in the bulbs.

		Healthy.	Diseased.
No. 1.	Chloride of sodium	13.990	5.153
No. 2.	Ditto	21.99	13.92
No. 3.	Ditto	5.45	11.39
No. 4.	Ditto	7.04	6.15

On this Dr. Anderson says: "The proportion of chloride of sodium, which is the measure of the quantity of chlorine, was generally much larger in the healthy than in the diseased turnips."

Now we think this is as legitimate a conclusion from his analysis as anything can be, that chloride of sodium may, and probably has, with the condition of some alkali in the soil, everything to do with the

disease; and we have again to lament that no experiments are made—none suggested, but an unsound theory set up, on very slender basis, and the attention withdrawn from the condition of the soil.

We believe, however, enough is proved to show that experiments should be made of some dressing of lime and salt; and we have great confidence that a powerful dose, applied before turnip time—indeed as soon as possible—may have much to do with staying off the disease. We intend to state the grounds for this opinion, and to give our reasons for thinking *insects* are not the first movers in the production of the disease.

The connexion between decay and vitality is so extremely intimate that the former has more than once been stated as the cause of the latter. It was the favourite theory of one school of philosophy that life was the offspring of decay, and it is not impossible that Hydra was intended to embody and personify this principle of antiquity. It is not necessary, however, to believe this to see that decay and insect life are so intimately connected that it is difficult often to say whether the decay resulted from insect ravages, or whether the insects were a host of scavengers to remove the load of decomposition, and so prevent the malaria which would otherwise follow in its wake. The mice which always followed an overflowing of the Nile, were accounted by the Egyptians to be a creative power of the fresh mud, the last creative energy left in an old and worn-out world; and it is easier to adopt an imaginative theory like this, which requires neither investigation nor trouble, than it is to say how and when any given tribe of insects came on a decaying substance.

Whether insects are the *cause* or the *effect* of the disease called fingers-and-toes in turnips, is still enveloped in no small degree of obscurity—known in Suffolk in the time of Arthur Young; treated of by the entomologist Spence in 1812, in Yorkshire; by the Caledonian Horticultural Society in 1819; by the Highland and Agricultural Society of Scotland in 1828, and again in 1853; and now we seem to know less whether insects are to blame for causing the malady, or to have the credit of removing the decay which that disease produces. Mr. Anderson says “the most probable explanation is that which attributes the disease to the attacks of insects.”

Mr. Anderson shows this to be the more probable, because though many of the correspondents of the Highland and Agricultural Society of Scotland saw no symptoms of insects, it is only negative evidence, and as they will not attack the leaves, but rather the roots, they may easily escape detection. This is quite true; but we have ourselves examined young turnips

which we knew beforehand would be diseased, have thinned them out day by day, and watched most minutely the progress of the plant, and are satisfied that no insect was there until the disease had gone on to a very mature stage indeed.

If insects do first attack, it is something quite anomalous. We have often seen instances where for ten or twelve years in some three successive rotations the turnips were sown on one side of a line as straight as a furrow could be drawn, and completely diseased on the other. There is no law of insect life, with which we are acquainted, that would keep them for twelve years in one line so very accurately, when the whole field was treated exactly alike; and this alone would, in our opinion, be amply sufficient to settle the whole question.

The evidence of the practical men whose opinions are taken, however, shows that the facts they have observed are almost all inconsistent with the insect theory.

1. The disease is by far the most common on light soils. The parts usually the most affected are the lightest portions of the field, and where clay soils are affected they are of the lighter sorts of clay. This might be consistent with insects being the cause of the disease, because in these soils they would find the most easy and ready access to the roots; but it is also admitted, and is fatal to this view of the case, that soil much trodden will be affected, while all the rest of the field is free from the malady.

2. The spreading of some sorts of subsoil—far removed from insect as from vegetable life—especially an iron subsoil, will make a newly improved moss liable to the disease, as in the case of Mr. Gardiner; and this is decidedly against the insect theory. The insects could hardly be in the iron subsoil, nor is there any evidence that the soil from the place under which it was taken was at all infected with this disease of the turnips.

3. Mr. Wilson has facts quite as adverse to the insect advocates. He had a ditch scoured out, and the mud conveyed to the turnip field, and there was not a diseased turnip in the field in any part but where the mud had been spread. How unlikely that any insects inimical to the turnip could be obtained by such a process! and if they had been, why did they confine themselves to the identical line of the mud?

4. If it were due to insects, a rest of the soil long enough would certainly cure it. And yet instances are mentioned, in this very report, of land being in pasture from ten to fourteen years without producing the least effect on the disease.

5. Another reason fatal to the insect theory is that the disease will appear on land which had never grown turnips before, and where there could

be no turnip root-attacking insect in the land; while it is abundantly clear the insect will not come from a distance, as is proved by its keeping to lines as uniform as a subsoil application or a mud dressing extended.

6. Many reporters disapprove of winter ploughing, or ploughing the land whilst wet, as being favourable to the development of the disease; but this would not encourage, but rather have a tendency to destroy the insects, if they were in the soil.

So much for a few of the facts inconsistent with the insect theory developed in the report itself. The positive evidence of their being present in the very early stages is also extremely slight. True, Mr. Finnie and Mr. Hunter observed worms or grubs, and Mr. Wilson a centipede; but these were in extreme stages of the disease. But Mr. Lindsay found the bark of some plants he pulled up gnawed round by a small red hairy worm, and Mr. M'Turk discovered ruptures of the cellular tissue over the galls or tissues.

But this is surely an advanced stage of the disease. The commencement is a small knot formed on the root, so fine that it can hardly be detected, but by drawing through the fingers, and this is perfectly sound in every part, neither evidencing puncture, nor gnawing, to the finest and most careful observation; so that it is only when this enlarges and cracks, and by admitting the air commences putrefaction, that the anthomya brassica lays her egg—her “fly-blow” on the turnip leaf—at the time these usually begin to flag, to feed her brood on the decaying matter when the “blow” becomes a maggot.

The centipede follows by the same rule; and the minute patches observed by Mr. M'Turk are nothing more than a development of the disease somewhat later, instead of the very minute enlargement, which is quite sound, and which is an internal swelling of the bulb, extending the skin till it begins to excoriate. We exempt insects most completely from all blame in the matter, and shall in our next direct the attention of our readers to recent experiments on the subject of the disease.

LAW OF TRESPASS.—CATTLE FEEDING ON THE PUBLIC ROAD.

COURT OF EXCHEQUER.—FRIDAY, JAN. 27.

ALLUM v. BOULTBEE.

Mr. Griffiths opened the pleadings.

Mr. Sergeant Thomas said the plaintiff in this action was a small farmer at Shredding Green, Iver, where he kept a beer-shop, which unfortunately for him was situated opposite the defendant's mansion. The defendant, the Rev. Richard Moore Boulton, was a clergyman and magistrate, and on the 23rd of July last, as the plaintiff's cow-boy was driving the plaintiff's cow to a meadow, the defendant came out of his gate, and drove

the cow into his yard. In the course of the same day the cow was seen in the road, and the boy was sent to fetch the cow. As the boy was driving back the cow the defendant came to his gate, and he and his servant again drove the cow into his premises. The plaintiff called for his cow in the evening, but the defendant refused to give her up, unless the plaintiff paid him 6d.: this the plaintiff refused to do, as the defendant then admitted the cow had not done any damage. The plaintiff went again on the Sunday morning and evening several times, but was told that he should not have the cow without paying 1s. The plaintiff then went to Mr. Woolf's, of Uxbridge, who wrote a letter demanding the cow, which the plaintiff delivered. The defendant still refused, and kept the cow till the 30th of July. The cow was suckling two small calves, and from the loss of milk they wasted in flesh, and they were sold at a loss of £3 10s.; the cow, too, was injured, and lessened in value between £4 and £5, and it was to recover compensation for this loss, and the trouble occasioned by the defendant's wrongful act, that this action was brought.

Mr. Skinner appeared for the defendant, and, after addressing the jury, called the defendant, who swore that the cow was alone, and had been grazing a quarter of an hour or twenty minutes, on the side of the road opposite his gate, which was by an award under an Act of Parliament made his property, and that he took the cow for trespassing. He positively denied that the cow-boy was there. The cow had escaped, and he had sent his servant for it in the evening, and he did not see the boy near, though he would not swear that he was not there.

Mr. Wilson, a late Principal of the Agricultural College at Cirencester, proved that calves would thrive well on gruel, though deprived of milk.

Sergeant Thomas replied at length.

Mr. Baron Platt, in summing up for the jury, said that upon the first issue the plaintiff was entitled to a verdict, for it was not disputed that the defendant had impounded the cow, and a plea of that kind was only put upon the record to compel the plaintiff to prove the facts, but the jury would have to consider whether the defendant was justified in what he did. If an animal in being driven on a highway should a little bit hedge it could not be restrained—a mere taking by the animal by snaps and morsels would not render it liable, but if cattle comes upon your land, the act of so coming is unlawful, and the law implies damage. Now, the soil of the public road belongs to some one, but the public have a right to pass and repass, and the land on either side belongs to the owner of the adjoining land, and he may enclose it if he pleases; he might put his dung upon it, or the like.

Mr. Sergeant Thomas submitted that this was not a correct view of the law.

Mr. Baron Platt: The jury must take the law from me, and if I am wrong the Court will correct me. The case entirely depends upon which you believe. If you believe the boy's evidence, the plaintiff is entitled to your verdict, for at the time of the seizure the cow was in the road and not doing damage to the defendant's land; but if you believe the defendant's evidence, then he would be entitled to the verdict, for, according to the defendant, the cow was upon his land for twenty minutes. The learned judge then contrasted the evidence of the boy with that of the defendant, at the same time saying that the question was one entirely for the jury. Was the cow at the time really trespassing on the land at the side of the road? If it was, then the defendant was justified in seizing it, and you must find a verdict for him.

The jury retired for about half an hour, and then returned a verdict for the plaintiff. Damages—£10.

AGRICULTURAL STATISTICS.

A man should be the best judge of his own business—of what aid he may require in pursuing it, and of what interference he may submit to from others in properly righting himself. The authority of practice is seldom to be denied; if, indeed, an argument can be conducted to anything like a fair conclusion without becoming attention to the opinions of those most directly interested in the point at issue. It has ever been our aim to pay this deference to the agriculturist. Few classes certainly find so many mouth-pieces, few as many friends anxious to speak for them. We prefer rather that he should speak for himself—pressing his own claims, and improving his own position.

Let us test one of the latest arguments offered by this authority. The Government consider it their duty to ascertain, or at any rate to endeavour to do so, the amount of food they can from their own resources provide for the people. Admitting that they so far know something of their own business, we will say that they are justified in this attempt—That it is their duty to have some more certain data as to the maintenance of the population. We will suppose that the collection of some such information would tend much to give fair play to every one—to producer equally with consumer. We can imagine it gradually doing away with that jobbery, and one-sided spirit of speculation, by which so few profit, and so many suffer. We might all then be alike in the secret, and enjoy the best means of making the best of that we have to trade in.

The proposition, we repeat, looked like a laudable one, while it was introduced under very encouraging auspices. Some of those most respected amongst us, long and well tried as farmers' friends, at once took upon themselves to support the carrying out of such a scheme. They saw nothing but good in it—scarcely more indeed as a national advantage, than an individual one to him on whom we had to rely for the success of the project.

This was the practical agriculturist, and to him we come at last for his opinion, and, as it was trusted, approval. We know too well how the offer has so far been received. Commencing, perhaps, with an excess of caution for which our rulers are now becoming remarkable, the ministry confined their first experiment to one certain district. They chose, it is difficult to say why, certain parts of the county of Hampshire to represent the feelings of the English farmers generally. They asked the cultivators of the soil in these districts to furnish some particulars of what they were able to produce.

As a rule, the request was indignantly refused. The Hampshire farmers were not going to submit to any such system of inquisition. What was it to anybody but themselves what corn they grew? They returned Mr. Hawley his papers, inscribed with brief but significant comments; they ridiculed the idea as altogether impracticable; they called a meeting of the Winchester Farmers' Club, and passed a not quite unanimous resolution that the attempt to collect agricultural statistics was obnoxious, inquisitorial, and everything that was bad.

The object to be sure was somewhat more favourably entertained in Scotland. It will be better, however, here to confine ourselves to England and the English. Taking, then, their own chosen authority, the county of Hants, as the oracle of opinion, the Government had to record their attempt at the establishment of agricultural statistics as a very signal mistake. The English farmer does not want, and will not have, anything of the kind. And the Board of Trade was a house of mourning, and Mr. Cardwell no longer a sanguine man.

But a few months or weeks pass away, and Parliament opens for business, and the English farmer comes to say what it is he *does* want. He has a grievance of long standing that must be remedied, and that it will be to the advantage of everybody to have looked into. He considers it well over with himself first, he gets more and more resolved upon it, until at length he boldly knocks at Mr. Cardwell's door, and tells him what he ought to do. The President, naturally enough, asks what he requires? Well, then, there are certain returns connected with the growth and sale of corn that are not properly obtained. Mr. Cardwell is all politeness and attention, and the other proceeds. He wants the grower of corn to make a return of all he sells, and, to meet certain objects, he ought to sell, head and tail, every bushel he grows. He ought to be made to do this, only once over though—only from the grower, mind. You must force him to do it; and if he doesn't, fine him. Make a law with a penalty attached, that shall insure his attention. "Are you really prepared to recommend such a measure as this?" slowly demands the now yet more attentive Mr. President. "*I am,*" answers the other with most indisputable emphasis. "Sir, I'm delighted to see you. Will you go on, if you please; will you say something more about agricultural statistics." "I'm not talking about agricultural statistics; I'm talking about the corn averages. I'm the Winchester Farmers' Club!"

"It is all the same, sir; I am delighted to see you," says Mr. Cardwell.

It is rarely indeed that we have heard a question better handled, or one in which the opinion expressed was more unanimous, than that, as argued last week by the London Farmers' Club, on the present imperfect mode of taking the corn averages. It is one of those discussions, too, out of which good is almost certain to come; and the club took the direct means of arriving at this. It is impossible, however, to read over the proceedings here, and at the Board of Trade the following day, without being struck with the palpable contradiction involved in them. The Winchester Farmers' Club, as Mr. Cardwell was told, has long been complaining of these imperfect averages; with its members, indeed, the present remonstrance chiefly arose, although the same complaint has been made over and over again in almost every other part of the kingdom. The Winchester Farmers' Club wants correct returns of all the corn grown, to be obtained of the producer at the time of sale; yet the Winchester Farmers' Club has been the first to condemn any proposed system of collecting the returns of the produce of this country!

It is with sorrow that we have to make such a return!

It is but fair to say that Mr. Pile, the chairman of this club, and one of the speakers on the deputations, stood almost alone in support of those statistical returns, which his friends and neighbours so resolutely opposed. We have only to hope that they will come more and more to agree with him. We ourselves believe that the establishment of agricultural statistics would be no injury to the farmer, that the collection might be made without becoming in any way inquisitorial, and that in the end a positive advantage to the producer in the way of accurate and general information would be the result. The better method of taking the corn averages cannot be but regarded as a becoming prologue to considering the question of agricultural statistics. The two are, and must be, intimately associated, calling as they both do on the farmer for information. If we give the one, it will be hardly worth while withholding the other, and Mr. Cardwell's offer, after all, sounds like a very fair one—"Help me and I will help you."

It is, in fact, to this that we shall have to come. On the authority of practice we much want full and correct returns of the corn produce of this country.

THE GUANO QUESTION.

SIR,—I feel ashamed to trespass so often on your valuable space on this question, but its importance is not generally understood. The facts stated by Colonel Blair in the House of Commons last night show how much an increased supply of food in this country is dependent on an increased supply of guano. From the Isle of Wight to the Orkneys the farmers know the value of this manure, and, though the people may not be aware of it, the scarcity of corn, great as it is at present, would have been much greater but for its beneficial effects.

I know that some cautious people think me wrong in urging this view of the question, on the ground that, the stronger we show our necessity, the more firmly do we persuade the Peruvian government to hold back, and enhance the cost of the supply. But it is impossible that we can be in a worse position than at present. Under this system, on five different occasions—1844, 1848, 1850, 1853, and 1854—have we suffered from an inadequate importation. There are orders now in Liverpool for 7,000 to 8,000 tons, to meet which the agents, who have undertaken to regulate the supply, have in stock about 1,500 tons; and, though large quantities are known to be on the voyage, they decline to make any sales.

Then, we know that the effect of American remonstrance, somehow or other, has given largely increased supplies there during the very time that ours have diminished. At the meeting of the Royal Agricultural Society yesterday, Mr. Pusey and the Duke of Richmond publicly stated their intention of availing themselves of this by ordering the purchase of a cargo, through American agency, to be delivered in this country.

Whatever the impediments may be, it is a very extraordinary fact, that one half of the large supply to America, in 1853, was carried in British ships. There must be some preference, either in the way of facilities for loading, or in the rate of freight offered to America, which thus diverts the trade from us, for it is quite clear that scarcity of shipping cannot be pleaded as the cause. The British agents may not be able to get vessels, but the American agents do. And no one can be surprised that in the present active state of employment for vessels a shipowner will not send a valuable ship to be locked up there for three months; for the facilities of loading are said to be not greater than they were seven years ago, when the exportation was about a tenth of what it is at present, and upwards of 80 days are now spent in getting in a cargo, which, under proper arrangements, would not occupy a week. This delay can be no advantage to the Peruvian government, and an open trade would be immediately followed by arrangements for expediting the loading of ships.

But how important soever the supply of guano may be to us, in a much greater degree is it the interest of the Peruvian government to convert it into cash while it possesses an exchangeable value. By exacting too high a price sales would at once cease, for, beyond a certain figure, there would be no profit in using it. And, now that the attention of scientific men has been applied to the subject, there cannot be a doubt that sooner or later, in one year it may be, or in five, the sewage of our great towns will be rendered available for agriculture. A project which gives every promise of success is about to be tried in Glasgow, by which a very valuable solid

portable manure will be extracted from the sewage of that city which, it is estimated, may be sold, with a large profit to the company, at £2 a ton. Whenever this can be accomplished, the waste of our great cities will supersede the use of guano, and that now valuable commodity will at once cease to be worth the expense of carriage from Peru.

Nor is this the only opposition to which they are exposed. Other guano deposits of equal value may be discovered, and the Peruvian monopoly at once be put an end to. Sir James Graham announced on Tuesday night, that not only was every exertion being made by our ships in the Pacific to discover fresh sources of supply, but that in another quarter a search was about to be instituted, in the hope that a discovery would be made which would largely increase the supply.

It is far from my intention to imply that the best efforts of the present government have not been used to prevail upon that of Peru to open the trade. The assurance given in the House of Commons by the President of the Board of Trade and the First Lord of the Admiralty leave no doubt on the subject; and, amid the multiplicity of affairs which demand their attention, and the grave and engrossing duties which the present crisis imposes upon Sir James Graham, we may feel thankful that he can give any part of his time to this. Indeed, it cannot be matter of surprise to those who have any knowledge of the laborious duties which the enormous business of this country throws on the chiefs of departments, that some things are occasionally overlooked, which the importance of those who are interested in them can alone bring into notice. I was yesterday made acquainted with a singular instance of this. In August last it was announced that a discovery had been made of certain islands in the eastern seas on which there was said to be a large supply of guano. It appears that the discoverer journeyed home with all speed, bringing with him samples of the guano, to avail himself of his discovery. He communicated the fact to the government, and disclosed the locality of the islands, with the very reasonable understanding, no doubt, that he should reap a reward in some degree proportioned to the value of his discovery. But the sequel is the strange part of the story. On looking into the matter further, it was found, as I am informed, that those very islands had been surveyed in 1859 by a British officer, whose report had been since then in the government offices, on reference to which it is now seen that especial mention is there made of the large supply "of this manure, so valuable to the agriculturists." If this be indeed so, we owe not the less to the last discoverer, whilst this singular corroboration of the value of his discovery gives us good reason to hope that even already we are in possession of a counterpoise to the Peruvian monopoly.

JAMES CAIRD.

—Times.

AGRICULTURAL QUERIES.

SIR,—I have taken a place, attached to which are twenty-one acres of grass, for which I am to pay nearly £3 per acre. Will any of your readers kindly inform me the most profitable plan of conducting the same, not being allowed to plough it?

SIR,—A constant reader of your valuable paper would feel much obliged if any one of your numerous subscribers would answer the following questions:—What is the best kind of manure to sow on wheat in the spring, and what quantity per acre? also, the best artificial manure for beans, and the quantity to be applied?

J. C.

SIR,—Will you, or any of your corresponding friends, inform me whether any turnip cutter has yet been invented which will cut turnips or mangold into pieces not larger than a Windsor bean? The common and excellent cutter by Gardner cuts into pieces much too long for sheep, and causes much waste. In feeding from one to two hundred sheep the loss amounts to a great many bushels in the course of one winter.

H. S.

SIR,—Can any of your readers tell me of a remedy for "sweet cheese"? If they can they will be doing great service to myself and dairy farmers in general.

I am, sir, your obedient servant,

A SUBSCRIBER.

Query, what is meant by "sweet cheese"? Probably some one can answer "A Subscriber."—ED. M.L.E.

SIR,—I should be much obliged by your all-wisdom through the columns of your valuable journal, to ask "Subscriber" if there is any risk in giving the medicine recommended for the rot in sheep to ewes forward in lamb?

G. G.

SIR,—Information to the following will much oblige:—Provided a quantity of gypsum dropped to the bottom of a well sufficient to form a bed, whether the water would become impregnated with its valuable qualities. GEO. ARNOLD.

SIR,—I shall be obliged if some of your numerous readers can inform me at what age a pig puts up the tank? and, if a hog or sow, is there any difference in the time of putting it up? Or, is there any other mode of ascertaining the age?

A SMALL FARMER.

ANSWERS TO AGRICULTURAL QUERIES.

QUICK-LIME AND SALT.

"A Subscriber, Borobridge."—This may be applied to corn crops with advantage as a top-dressing. Mr. Huxtable found by experiment that it was a safe and useful application. It is best applied to moor-land or light deaf soil. The best mode of application is to dissolve the salt in water, and slake the lime with it; or it may be mixed with the lime immediately after slaking. The quantity may be as few as 4 cwt. per acre to 2 or 3 tons of lime. The result will be caustic soda, which will speedily dissolve the organic matter of the soil, and assist the yield and brighten the sample of corn.

TOP-DRESSING OF GUANO.

"A.R."—This may be applied at once. Sow broadcast, either with snow on the ground or before rain if possible. The stock will not be injured by running on the land after the application, but sheep will eat the saline guano. It should be washed in before the stock are allowed to eat the herbage.

PROFITABLE USE OF GRASS-LAND.

Manure highly, and sell milk cows if near a town; if not, feed cattle by soling, and dress with their liquid refuse. Very high manuring will enable you to feed one beast per acre, if the land is of the quality to justify a rent of £3 per acre.

WHEAT MANURE IN SPRING, AND BEAN MANURE.

"Constant Reader."—For wheat, nothing so good as guano. See our "Leader" of next week. Two hundred weight per

acre, or if poor three; applied before rain, or in snow, and hoed or harrowed in. Farm-yard manure is best for beans; to put in ridges, and sow, like turneps. The next best is guano, sown on the land broadcast, and then ridged up and the beans sown.

CLOVER FAILURE.

"W. Streeter."—To the best of my recollection, the nitrate of soda, &c., was applied as top-dressing at the beginning of May, and the contrast with the other clover on the estate was the striking feature, the top-dressed being as rich a crop as I remember to have seen, the other fields as thin and pale as that was luxuriant. How far it may be a general remedy must be left to extended experiments. But where we can increase the produce of clover we also increase the roots; and the roots of clover, rotting in the ground, seem to be an excellent

preparation for wheat. I do not remember a deficient growth of wheat after an abundant crop of clover. Mr. Streeter is correct as to my willingness, in common with other agricultural chemists, to answer *publicly*, as well as we can, questions of public utility; but your readers must not hence infer that we have time to acknowledge, *individually*, the host of private inquiries that come by the Penny Post. Such as are important enough to be worth paying for the time and research of course we are glad to receive and answer, but not to sacrifice time and thought upon questions worth no more to the inquirer than the trouble of writing and the penny stamp.

J. PRIDEAUX.

SWEET CHEESE.

"A Subscriber."—This is a local term. What are its symptoms—effects? and when do they develop themselves?

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.			ATMOSPHERE.			WEAT'R.
1854.	a.m.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.		
22	30.13	30.01	37	49	45	Southerly	lively	fine	sun	cloudy		dry
23	30.12	30.07	37	50	42	Southerly	gentle	cloudy	sun	cloudy		dry
24	29.74	29.74	39	45	40	Southerly	forcibl.	cloudy	cloudy	fine		rain
25	30.11	30.09	32	47	44	Southerly	rising	fine	sun	cloudy		rain
26	30.34	30.56	38	49	38	W. by South	var.	fine	sun	fine		dry
27	30.52	30.26	37	47	47	S. by West	strong	cloudy	cloudy	cloudy		rain
28	30.14	30.20	45	49	37	Westerly	gentle	cloudy	fine	fine		rain
29	29.90	29.95	37	52	50	S. West	brisk	cloudy	cloudy	cloudy		rain
30	30.13	30.16	50	52	48	S. West	lively	cloudy	fine	fine		dry
31	30.21	30.11	48	51	47	West by South	lively	cloudy	cloudy	cloudy		dry
Feb. 1	30.02	30.00	45	50	43½	West by South	lively	cloudy	cloudy	cloudy		slight rain
2	30.13	30.30	37	46	33	N. or by East	gentle	cloudy	sun	fine		dry
3	30.30	30.26	28	42	32	N. or by East	calm	fine	sun	fine		dry
4	30.11	29.85	29	44	39	S. by West	gentle	fine	sun	cloudy		dry
5	29.88	29.91	39	50	50½	S. West	rising	cloudy	cloudy	cloudy		dry
6	30.61	30.11	46	59	50	Westerly	brisk	fine	cloudy	cloudy		dry
7	30.04	30.05	49	51	42	W. & N.W.	brisk	cloudy	cloudy	fine		dry
8	30.10	30.19	37	45	42	Wly. & N.W.	brisk	fine	sun	cloudy		dry
9	30.05	30.17	38	43	34	W. and North	brisk	cloudy	cloudy	fine		shower
10	30.24	30.24	30	40	36	North	fresh	cloudy	sun	fine		dry
11	30.26	30.20	33	40	32	North	gentle	cloudy	cloudy	fine		dry
12	30.16	30.31	29	43	33	N. East	gentle	cloudy	fine	fine		dry
13	30.46	30.60	29	40	26	N. East	gentle	fine	sun	fine		dry
14	30.63	30.32	23	41	38	S. West	airy	fine	sun	cloudy		dry
15	29.94	29.98	33	44	32	N. by East	fresh	cloudy	cloudy	fine		slightrain
16	30.00	30.00	30	40	38	N. West	gentle	cloudy	sun	cloudy		dry
17	29.79	29.40	37	47	35	W. by S.	strong	fine	sun	cloudy		rain
18	29.43	29.73	30	37	32	N. & N.W.	brisk	fine	sun	fine		snow
19	29.91	30.00	29	41	34	N.N.W.	lively	fine	sun	cloudy		dry
20			33	50		Westerly	gentle	haze	cloudy	cloudy		rain

ESTIMATED AVERAGES OF FEBRUARY.

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Barometer.			Thermometer.			Highest.	Lowest.	Mean.
High.	Low.	Mean	High.	Low.	Mean.	46.133	32.8	39.466
30.820			53	21	38			

WEATHER AND PHENOMENA.

Jan. 22. Bright till sunset. 23. Damp and cloudy morning. 24. Much rain and wind. 25. Rime, fine day, stormy night. 26. Fine day. 27. Total change, wet and wind. 28. Miserable, damp day, clearing. 29. Rain early, wind. 30. Improved. 31. Pleasant and lively, wind rises at night.

LUNATIONS.—Last quarter, 1h. 23m. afternoon. New Moon, 28th day, 5h. 12m. afternoon.

Feb. 1. Generally gloomy, drying. 2. After night, rain, fine. 3. Keen, white frost. 4. Fine early, cirro-stratus, and then rain. 5. Damp and chilly day, windy evening. 6. Fine, fresh air. 7. Same. 8. Gleams and cloudy. 9. Sharp shower. 10. Cloudy, with gleam. 11. Calm, quiet day. 12. Pleasant day. 13. Keen frost. 14. Frost, changeable. 15. Wet over night, dark cold day. 16. Changeable. 17. Rainy, p.m., stormy gusts. 18. After snowy night, clear frost. 19. Same; fine

weather. 20. Changeable, and a little small rain.

LUNATIONS.—First quarter, 4th day, 10h. 37m. afternoon; full moon, 13th day, 2h. 37m. morning; last quarter, 10h. 4m. morning.

REMARKS CONNECTED WITH AGRICULTURE.

The transitions of temperature, from many degrees above the usual average, from the 7th of January to the 9th inst. (when it declined steadily), had tended to induce a decided advance in growth. The re-accession of keen frosts acted as a timely check, and may prove very serviceable. The quantity of rain during the 16 first days of February is registered at only 0.36 of an inch—a small volume for that “dripping” month; but so completely saturated had been the land, that for the present it may be deemed amply supplied. The trial month of March approaches; and if *that* prove auspicious, the best hopes of highly promising crops may be entertained.

J. TOWERS.

Croydon.

CALENDAR OF AGRICULTURE.

The sowing of grains must now proceed quickly—oats, barley, peas, beans, and vetches, as fast as the season and the means of execution will permit. Sow flax and lucerne on well-prepared grounds, the latter in 12 to 20 lbs. on an acre, and sainfoin in 1½ cwt. to an acre, and dress with gypsum. Sow parsnips and carrots on well-prepared grounds of good quality: drill at 18 inches' distance on the flat ground, with seeds steeped in lees of urine or in a solution of nitrate of potass, six to one, and dried by encrusting with quick lime. Top-dress clovers and young wheats with applications of rape, dust, malt coombs, gypsum, and nitrate of soda, the latter at one to two cwt. per acre. Sow cabbage seed for summer plants. Put light stock on watered meadows. Set traps and spread mole-hills; bush-harrow, roll, and finish the dunging of grass lands.

The planting and cutting of timber of any kind must now be finished. Plant hops on dry and deeply rich lands, trenched and well-prepared; make the hills at six feet distant each way, which best admits the scarifier; put four sets in each pit, one in each corner, and cover lightly with earth.

Begin to cross-plough the lands intended for green-crop fallows; remove all turnips from the fields, and carry out dung in weather unfavourable for sowing.

Send the strong lambs to the natural and artificial grasses, or to the watered meadows. Feed the ewes amply with juicy food, swedes, beetroot, and cabbages, which must have been preserved for this most necessary purpose.

The feeding of hogs for bacon will cease this

month, and the foremost fed bullocks must also be removed. Remove all dung to the manure heap, and keep all houses clean. Set poultry on eggs for hatching, and exchange eggs with any neighbour; feed well and attend to cleanliness, and provide good accommodation for the young broods. It is both pleasant and profitable to see a numerous and healthy flock of poultry on any farm.

RENDLE'S NEW FARMING PRICE CURRENT AND AGRICULTURAL DIRECTORY FOR 1854.

William E. Rendle and Co., Plymouth.

We have just seen a copy of this excellent Price Current, and consider it a most valuable companion to the agriculturist. It is the same size as the garden edition lately reviewed in this paper. It contains an excellent manual, with the university terms, eclipses, &c., and a list of fairs and great markets held in the four western counties. The descriptive lists of grasses are excellent: they give all the best varieties for permanent pasture, ornamental parks and lawns, sheep walks, heath and moory lands, &c. Then comes the list of clovers and turnips all described in a concise and useful manner. Then follow descriptions of the best mangolds, carrots, and other vegetables used in agriculture. Then we have a price current of all the best natural and artificial manures, with much useful information relative to Peruvian guano, Lawes's patent superphosphate, nitrate of soda, bone dust, Bolivian guano, &c. Then are found some very good advice relative to the purchase of so-called wheat manures. But the best paper is one contributed by J. B. Lawes, Esq., of Rothamsted, “On the Cultivation of one Green Crop after another on Heavy Land.” This should be read by all engaged in agricultural pursuits. Then there are some valuable tests for discovering adulteration in manures by J. C. Nesbit, Esq., the celebrated agricultural chemist; and the report of a lecture by Professor Way on the same subject. Then follow the advertisements, comprising some illustrations of the best implements of the day. It is very well got up, and comprises 52 closely-printed pages, crown-quarto size, and we strongly recommend it for the perusal of all engaged in the healthy pursuit of agriculture.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR FEBRUARY.

During nearly, or quite, the whole of the month, the weather has proved remarkably fine for all outdoor farm labours. In all parts of England, therefore, great progress has been made in ploughing and sowing, with the land in tolerably good condition. At one period, complaints were rather general that the winter wheats were growing too fast; but premature exuberance was checked by the seasonable frosts experienced about the 16th. Although the wheats are not looking very promising on some of the heavy lands, we may observe that there is every prospect of a good crop. During the past season, and, indeed, up to the present time, farmers in general have been singularly favoured in respect to weather; hence, and under the stimulus of high prices, and the prospect of the better kinds of food ruling dear for several months, an unusually large breadth of land has been sown with wheat in the whole of our leading counties. A great difference of opinion continues to exist on the all-important question as to the available supplies of wheat in the hands of the growers. We ourselves are under the impression, from data furnished to us officially, that there is yet a fair average quantity of the growth of 1852 still in stock, but that the supply produced in 1853 is comparatively limited. Whatever may be the actual quantity, it is quite clear that we shall require very large imports of wheat and flour to meet consumption. On the whole, the wheat trade, arising from the extensive arrivals from the United States, and the fact that re-shipments of produce have been made to some extent from France and Belgium, has been inactive, and prices have had a downward tendency. The decline has, however, been checked, owing to the impending war with Russia, and the possibility of our future supplies of grain from that quarter being cut off. We must not, however, be led astray on this point. To us it is evident that the vast resources of America have been greatly under-rated in this country; and it is equally clear that the produce of the States will be poured in upon us in enormous quantities during the whole of the present year, as we have the best authority for stating that the surplus produce likely to find its way down to the shipping ports from the interior will exceed all present calculation.

The yield of last year's barley crop must have

been unusually extensive, when we consider the large additional supplies which have already been disposed of, and the extensive supplies, which yet remain unthrashed. Oats have been a productive crop, especially in the near metropolitan counties, which have furnished heavy supplies, since we last wrote. Both beans and peas have turned out remarkably well. The high prices having checked consumption, and the arrivals from abroad having been good, dealers generally have purchased these articles sparingly, and the quotations have tended downwards.

There has been rather a firm market for English wool, and prices have kept up remarkably well, notwithstanding the "strikes" in the manufacturing districts. The public sales of colonial—at which about 40,000 bales are being offered—have progressed steadily, at currencies about equal to those paid in October last. The imports of wool from our colonies this year have doubled those of 1853 to the same period.

The markets for the sale of hay and straw have been well supplied; but the condition of the meadow hay has proved unusually inferior—indeed, such has been the musty state in which large quantities have been brought forward, that great difficulty has been experienced in getting rid of it at any price; the consequence is, that prime qualities have sold on high terms.

The cattle trade has been in a healthy state, owing in some measure to the severity of the weather on the continent having prevented large shipments of stock to this country. We are informed that the supplies in Holland ready for export are considerably in excess of last year. Great inroads have been made upon the stock of winter food, and we regret to learn that the foot-rot in sheep has rapidly increased in the whole of our flock districts. In many instances the losses have been severe.

For many months past we have repudiated the idea that *no* potatoes were left in this country, and the progress of events proves that we have been correct in our judgment. We do not deny for one moment but that the disease has been met with, to a serious extent, in the whole of our potato-growing districts; nevertheless, the stocks to be met with are still large, though in by no means first-rate condition. In Ireland and Scotland the supplies offering are extensive. Shipments to some extent continue to be made to this country, and we are

likely to have very large importations from Holland and Germany during the next two months.

In Ireland and Scotland agriculture is in a most prosperous state; indeed, present prices indicate that farmers are doing well. The corn trade has been less active, though we have no material fall to notice in the general quotations.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that numerous fluctuations have taken place in the value of live stock during the month just concluded, the trade has been in a healthy state. The principal drawback has been the bad condition in which numerous droves of sheep have been consigned for sale, and the low prices obtained for them. The want of an adequate supply of good wholesome dry food has increased the graziers' expenses, and the advanced rates paid for oilcake—the consumption of which has been large—have materially reduced the profits upon both beasts and sheep. However, the former appear to have paid well; but we are of opinion that those upon the latter have fallen considerably short of last year, when the late prices of store stock is taken into consideration.

Although the weather has been very severe on the continent, and most of the ports have been closed by ice, the imports of beasts, sheep, and calves have been seasonably good, and, on the whole, in fair average condition. As soon as the weather admits, we shall receive very large supplies, not only from Holland, but likewise from Germany and Spain. The quotations now ruling in our markets offer a fair margin of profit from the latter country. In Scotland, beasts have thrived remarkably well. No doubt, the number for consumption in London will steadily increase, owing to the facilities now offered for conveyance by railway, and, consequently, the comparatively few losses.

The total supplies shown in Smithfield have been as under:—

	Head.
Beasts	20,091
Cows	520
Sheep	92,441
Calves	1,028
Pigs	2,279

COMPARISON OF SUPPLIES.

	Feb. 1850.	Feb. 1851.	Feb. 1852.	Feb. 1853.
Beasts ..	16,727	17,393	18,737	19,308
Cows ..	445	524	433	470
Sheep ..	80,160	91,568	95,306	86,910
Calves ..	998	1,331	1,503	2,098
Pigs ..	1,819	2,340	2,439	2,420

The bullock supplies have been thus derived:—

	Head.
Norfolk and Suffolk &c.	8,600
Other parts of England	2,500
Scotland	1,240

Beef has sold at from 3s. 2d. to 4s. 10d.; mutton, 3s. to 5s. 2d.; veal, 3s. 6d. to 6s.; pork, 3s. 4d. to 4s. 10d. per 8 lbs. to sink the offals.

COMPARATIVE PRICES.

	Feb. 1850.		Feb. 1851.	
	s. d.	s. d.	s. d.	s. d.
Beef from	2 8	to 3 8	2 4	to 3 8
Mutton	3 0	4 6	3 4	4 6
Veal	3 0	3 10	3 0	4 0
Pork	3 2	4 0	2 10	4 0

	Feb. 1852.		Feb. 1853.	
	s. d.	s. d.	s. d.	s. d.
Beef from	2 2	to 3 8	2 8	to 4 2
Mutton	2 8	4 4	3 10	5 2
Veal	3 0	4 2	3 2	4 10
Pork	2 6	3 10	2 10	4 0

The imports of foreign stock into London have been:—

	Head.
Beasts	3,056
Sheep	6,226
Calves	1,380
Pigs	16

Total..... 10,633

Corresponding month in 1853	12,433
— 1852	9,123
— 1851	11,823
— 1850	3,880

Several arrivals have taken place at the outports.

Newgate and Leadenhall have been unusually well supplied with country-killed meat; yet the general trade has ruled steady. Beef has realized 3s. to 4s. 4d.; mutton, 3s. 2d. to 4s. 3d.; veal, 3s. 4d. to 5s. 6d.; pork, 3s. 4d. to 5s. per 8 lbs. by the carcase.

D U R H A M.

Since the date of our last report, and up to the 17th of January, the frost continued with unabated severity; on the 3rd it was most intense. We had a heavy fall of snow on the 28th of December, but it was soon drifted by violent winds. Turnips are much injured and rotten, particularly on light soils and billy ground; they have invariably lost their feeding and nutritious properties. They were a bad crop to begin with; but this severe visitation has been productive of serious inconvenience to the grazier. Stock will have to come to market freely in a half-fat state, and the loss will be felt in the spring months. Potatoes have also suffered to a great extent, the frost having penetrated the pits to an unusual depth; and, even in houses where they were supposed to be safe and perfectly secured, they are damaged. Sheep have shidden in condition considerably, and their wool will be found to be deteriorated; they ought to be supplied with sheds, to protect them against the inclemency of the season. Since the breaking up of the storm, the weather has been remarkably favourable for out-door farming operations, and a large breadth of wheat has been committed to the ground under exceedingly favourable auspices; and it is gratifying in having to observe that the autumn-sown wheats are assuming a very healthy appearance, without indicating

any premature luxuriance. We have experienced during the last month very heavy and destructive gales of wind, which have been productive of extensive loss of life and property on this coast; but the winds have had a beneficial effect on the land in preparing it for the reception of the seed, and also being well pulverized by the severity of the frost, it has worked kindly and mellow. Farm labour has for the last two years been much in arrear; but it affords us pleasure in having to state that it is now in a state of forwardness. The continuance of the snow storm enabled the farmer to proceed satisfactorily with carting out his manure to its destination—without cutting up his roads or injuring his land—leading draining tiles, and thrashing. But we are sorry in having to mention that the stackyards are assuming a very thin appearance. The last year's wheat crop is found, as thrashing has proceeded, to be extremely defective; in the later districts it is much sprouted, and rendered unfit for seed. Messrs. Cobden and Bright will find that free trade will not always insure low prices of corn, when the dispensations of Providence as regards the seasons are against us. The young clovers have gone off, and a great deficiency of plant is apparent. It is a mistake to tie a tenant up to a four or five-course system of husbandry; if crops were more varied, the land would not become clover-sick. In many parts on the continent we have witnessed splendid crops of clover; but this crop is not repeated oftener than once in eight years. It frequently happens that the clover crop is materially injured or destroyed by too high farming, having your crops laid flat on the ground. Much depends on the farmer's skill not to apply more manure than is necessary; but, if applied to excess, it is always attended with disappointment and loss. Agricultural labourers have become very difficult to procure at 18s. per week.—Feb. 15.

SOMERSETSHIRE.

The year 1853 will be a marked period in the corn trade, the range of prices being more varied than any since the alteration in the corn-laws, and proving what the writer ever maintained—that taking off the duty would not secure us even a low price, and that the holding out the small loaf was a delusion unworthy of those who practised it. I believe it will be found that from harvest to harvest (1853 to 1854), taking the lengthened term of high prices, the average of wheat and other corn will be higher than for any period before the alteration since the war. We only refer to the subject in reference to the working of the present system; we should not wish to agitate a settled question, the practical result of which has proved both parties at fault. We think there can be no doubt now of the shortness of the crop of 1853. The question now is, how far the high prices have forced the bulk of that crop prematurely into consumption? There was, no doubt, a much larger bulk of the growth of former seasons in the hands of growers when our deficient harvest was secured; but at *this* time there is, no doubt, less of the growth of previous years than last year, and we have made a greater inroad on our last harvest. To look forward, we have, it is thought, no better stock of foreign on hand, and should suppose much less of our own or foreign growth in the hands of millers, as they are already adopting the low stock system, and in this county, at least, using much less foreign in the mixture than last year; and, as long as they can get English, they will do so. Farmers will be likely to draw more freely on their stock with prices above 10s. than when lower; but this, we think, will be more than met by the large consumption we shall have for the next six months, and the inability of the millers to keep long out of the market. We quite hope prices will not materially advance; but we look forward, even with a fair promise, for the next harvest to necessitous purchases on the part of the needy, with unequalled supplies at periods, causing high figures upon the previous high rates. As regards the appearance of the crop on the ground, it is very decidedly backward, and in many instances very thin. Already the drill has gone over some of the thin pieces, and much more will have to be partially resown. This is a beautiful time to put in the early sprung wheat, and farmers, from last year's experience, are encouraged to put in

Nurseries, a very fair sample; and one of the best crops round this district was from Nursery sown in April last. It is much superior in weight and quality to the April wheat. Bean planting has just commenced, and the land works well. Winter beans are backward; not so many put in as usual. Autumn vetches are looking very well, and but far to be abundant produce; the clover plant is not so good, and we do not think the stock of roots equal to last year. Potatoes are certainly very scarce, and as the quantity for seed appears less than last year, for the next three or four months they will form a poor substitute for bread, &c.; other vegetables are proportionably scarce—so much for our prospects on the ground, and in stock. We now come to prices. Since the beginning of the year for one or two weeks 11s. was obtained for best wheat, once 10s. 6d. to 10s. 9d. current. It is now gone back to 10s. and 10s. 3d., extra whites, and from 9s. 6d. to 9s. 9d., red 9s. 9d. to 10s.; ordinary white wheat, inferior lots, 9s. to 9s. 3d. But stocks have been evidently lessening both in millers' and bakers' hands, and there seems at present more confidence and firmness on both sides. Beans have lately come forward, particularly large spring ones, faster than the demand relieves the market. Prices have gone back from nearly 7s. to 6s. 3d and 6s. 6d. Barley is still merely a drug, and prices are lower in consequence; grinding, 4s. 6d. to 4s. 9d., malting, 4s. 9d. to 5s. The demand for seed will take off some of the grinding qualities. Cats maintain their price better—24s. to 30s., 36 to 40lbs. per bushel. Cloverseed turns out both in crop and quality much worse than was expected, and very little good seed will be on offer—a great deal will be quite unfit for sale, or worth getting out. High prices are asked for the best; but there has been but little business done as yet. Cattle have done pretty well this winter, considering how bad the hay was made. There does not appear so much doing either in grazing cattle or sheep as in former years, if we may judge from the consumption of oilcake—corn being too high to be consumed as last year in this way. Neither do there appear so many pigs fattening. The high prices of cheese, &c., have caused a great demand for cows and calves; and they are full 20 per cent. dearer than last year. There is less disposition to buy sheep, as there has been in some districts a severe loss from the liver complaint and a more than usual number of barren ewes; except this, the lambing season has been good, but rather backward. Since we have had less rain, sheep have done better; but there is in many localities a marked unhealthy appearance in the stock. There is very little done in buying sheep this time of the year. There is some hope for poor stock at improved prices, at a considerable advance on last year; while beef and mutton have scarcely sold so well as they did a month since. Nothing passing in wool; and cheese is a quiet trade. Prices have not varied lately. Pigs 10s. per score; butter 13d. to 14d. per lb., and very scarce; potato seed 14d. to 16d. per 20lb.; very few eating ones on sale.—Feb. 16.

ROT IN SHEEP.

SIR,—Knowing the facilities offered through the medium of your columns to any beneficial information connected with agriculture, I beg to submit to you a recipe for the cure of the rot in sheep.

- Nitre, in powder 6 cz.
- Ginger, fresh powdered 4 "
- Colcothar of vitriol, in fine powder 2 "
- Common salt 3½ lbs.
- Boiling water 3 gals.

Pour the water hot upon the ingredients, stir them, and when just warm divide it into quart bottles, add to each 3 cz. of spirits of turpentine.

Keep the infected sheep from food all night; in the morning give each sheep four table-spoonful (remembering to well shake the bottle); starve for three hours, afterwards turn them into a dry pasture.

It may be necessary to repeat the medicine every fourth day for three times, observing the same rules.

The above, if given at an early stage, will effect a cure, and save some of the scores that are daily dying on the damp lands.

Desirous that any good results may be communicated through your most valuable paper,

I am, Sir, your obedient servant,

January 24th,

A SUBSCRIBER.

REVIEW OF THE CORN TRADE DURING THE MONTH OF FEBRUARY.

The wheat trade has taken a somewhat different turn to what was expected at the close of last month; for though the danger of war with Russia has become more and more imminent, prices have receded, instead (as was believed under such circumstances would have been the case) of advancing. The cause of this may, in our opinion, be found in the fact that the rise in December and January had brought our quotations sufficiently high to leave a margin for profit on consignments to this country, notwithstanding the high value of the article on the continent of Europe and in America. Shipments begun consequently to be made from points little expected, and we received offers of wheat and flour from places to which we had just previously been sending supplies. France, who had, during the autumn and early part of the winter, outbid us in the Black Sea, the Baltic, and in America, found that it would pay to sell what she had thus secured to England: vessels to load for British ports were taken up at Marseilles, and re-shipments of Polish Odessa, Marianople, and other kinds of wheat, began to be made from thence; at the same time, American flour was offered from Havre, and wheat from Holland and Belgium. Thus far, however, the entire supply has not been large, and the effect has been produced rather by the anticipation of more liberal arrivals hereafter, than any immediate pressure.

The mild, open weather experienced for several consecutive weeks assisted the downward movement, inasmuch as it gave rise to the belief that we should have an early opening of the Baltic navigation, and that the purchases known to have been made during the winter months would be likely to reach us sooner than had been previously calculated on.

Such having been the state of affairs, prices began to give way early in the month, and have continued to decline at all the principal markets in the kingdom, up to the period at which we write. Within the last few days there have been symptoms of renewed confidence, owing probably to the change in the weather, and the knowledge that some of the Lower Baltic ports, which had been nearly freed from ice, have again closed.

It will be seen from what we have just stated, that the probability of war with Russia, and what would be the inevitable result thereof, viz., the

total cessation of supplies from the Emperor's dominions, has been outweighed by temporary causes. No immediate scarcity has been felt; more wheat has been offered from the near continental ports than buyers have had the courage to take, and the possibility of shipments being hereafter forbidden from the Black Sea and the Russian Baltic ports has been little regarded. There can, however, be no doubt that in case of war being declared by England and France against Russia, the matter would be viewed in a different light, as it is impossible to overlook the importance of the trade in grain with the latter country. It is not alone England that has become accustomed to look to the Black Sea for a very large proportion of the whole of her imports, but France and the Italian states are in the same position; if this source of supply should therefore be altogether stopped, the effect would very soon make itself felt. Under these circumstances, we consider that the future range of prices will depend mainly on the turn political matters may take; and as there appears scarcely a possibility of war being averted, we have come to the conclusion that part of the decline which has taken place since we last addressed our readers will be almost immediately recovered.

Our position we conceive to be this; the acknowledged shortness of the last crop will cause this country to need a very large importation of foreign bread-stuffs right up to harvest. The supplies thus far have been on an almost unprecedentedly liberal scale; notwithstanding which, the accumulation has not been great, or, in other words, consumption has kept pace with supply. With the average price of wheat at 80s. per qr., the former has no doubt been economized as far as possible, and the latter encouraged; but when prices sink below that point, it will probably not pay to bring wheat from distant points of the interior, as has been done of late, to the ports of shipment; and we are inclined to think that the exports from France and Belgium, &c., will be checked, if not wholly stopped, by the reaction which has taken place in our prices. On the other hand, we believe that it will be necessary to import as largely as we have done hitherto, to prevent the extreme deficiency in our own crops being more severely felt than it has as yet been. The question therefore is, shall we be able to induce other countries, whose wants are nearly as urgent as our own,

to part with a portion of what they have, unless we are prepared to pay high prices? We think not, and should therefore be in no way surprised if the shipments from Belgium and France, which have produced so great an influence of late, were suddenly to cease.

The weather has throughout the month been highly auspicious for out-door labours, and farmers have been busily engaged ploughing, sowing, &c. A very large amount of work has been accomplished in a satisfactory manner. The sowing of Lent corn will afford employment for some weeks to come, after which we may calculate on receiving increased supplies of home-grown grain, unless, indeed, farmers' stocks are reduced into so narrow a compass as to render them unwilling to part with what they may still hold.

We have heard of no complaints, thus far, in regard to the appearance of the young wheat plant; indeed, the season may be considered as having been favourable. The weather was auspicious in the autumn, to get the seed in the ground; and though severe frost has been experienced, it has not been of a character likely to prove injurious to so hardy a plant as wheat; on the contrary, we may calculate on great benefit resulting from the same by the destruction of slugs and other insects. The prospects for farmers are decidedly encouraging—both autumn and spring sowing well accomplished, present prices remunerative, and the probability of a fair value for their produce being obtained hereafter; for one good crop will hardly suffice after so complete an exhaustion of old stock as is likely to have taken place by the autumn, to bring prices down to a *low* point.

We have endeavoured in the foregoing remarks to avoid any bias one way or the other, contenting ourselves with a plain statement of facts, and leaving it to our readers to draw their own conclusions. So much for the probable future. We shall proceed to give our usual retrospect of the course of the trade at Mark-lane.

That the farmers in the near counties are not large holders of wheat, may, we think, be inferred from the smallness of the supplies from Essex, Kent, and Suffolk. There has been no difference in this respect: with rising prices, and with falling markets, we have had the same uniform supply, seldom exceeding 2000 qrs. per week coastwise into London, and this quantity has embraced the supplies from Lincolnshire, &c. So exceedingly cautious, however, have the London millers acted, that the trifling character of the arrival has not prevented a decline of about 5s. per qr. taking place. This reduction has occurred as follows:—On Monday, the 6th inst., factors found it impossible to clear the Essex and

Kent stands without giving way in prices; and though they did so with evident reluctance, they ultimately consented to take 2s. per qr. less than the rates current on that day se'nnight, when a partial clearance was made. The trade subsequently showed increasing weakness; and before the Monday following, a further fall to about the same extent had taken place. For two or three days afterwards the tendency continued downwards, and the point of greatest depression occurred on the 15th inst., when quotations were 5s. per qr. below what they had been at the close of January. Since then there has been a slight reaction; not so much, however, as to warrant any quotable rise in prices; but the feeling has greatly improved, and the sales made on Monday last were at rates which it would previously have been difficult, if not impossible, to obtain. The London millers have certainly been working out of stock for several weeks past, and have lately displayed a desire to purchase, which they had not shown for a considerable time before.

The supplies of foreign into the port of London have not been particularly large, the entire arrival from the commencement for the month having amounted to only 60,000 qrs.; but for some weeks we had very little country demand, and local buyers declined to purchase beyond what they required for immediate wants. Under these circumstances, some holders began to lose confidence, and the decline in the value of foreign was fully as great during the first fortnight as that noticed above as having taken place in English. American wheat was more pressingly offered than other sorts, and very superior white Genessee, such as had at one period realized 93s. per qr., was, about the middle of the month, freely offered at 88s., whilst very capital qualities were parted with at 86s. to 87s. per qr. Lower Baltic wheat maintained its value better than other sorts, owing to its relative scarcity, but we shall not be far out if we estimate the fall on all descriptions at 5s. per qr. On Monday, the 20th instant, there was a full attendance of country buyers at Mark Lane, and though they did not take any large quantity individually, the aggregate amount of sales was rather considerable. This set our millers somewhat on the alert, and in partial cases 1s. per qr. more was realized for those kinds which had previously been most depressed than could have been obtained the week before. The feeling has since continued good, and in the event of an increased country demand, which we have a right to expect, the late decline would probably be speedily recovered. The arrivals of wheat off the coast from the Mediterranean and Black Sea ports have been large during the last two or three weeks, but a considerable number of the cargoes had been sold before they came to hand, and have been dis-

persed to different points—some to Ireland, some to Gloucester, a few to Liverpool, and others to London. The pressure has therefore not been felt on one point, and there are not at present many arrived cargoes off the coast undisposed of. The prices realized have been materially lower than those current a month ago, 74s. to 75s. having been taken for Marianopli and Berdianski, 64s. for hard Polish Odessa, 66s. to 67s. for Ibraila, and 52s. per qr. for Egyptian Saide wheat. A fair business has been done within the last fortnight in Lower Baltic wheat, to be shipped at first open water. The offers from the other side have been rather tempting, or buyers would probably not have been induced to act. The lowest offers have been from Stettin: contracts for fair quality of red to be shipped from thence have been closed at 70s. to 72s. per qr., including freight. Rostock wheat has not been sold below 76s. per qr., cost and freight; and many holders there have declined to sell under 80s. per qr., cost and freight. The extreme range may therefore be taken at from 70s. to 80s. per qr., freight to England inclusive. These rates leave a margin for profit on present quotations, but some allowance must be made for war risk.

The top price for town-made flour has undergone no change. Previous to the fall in wheat, the quotation for the manufactured article was perhaps somewhat low, and the millers therefore did not consider themselves called upon to reduce it when wheat gave way, more especially as there was reason to believe that the fall in the value of the latter would prove but temporary. Country flour, of which the supply has been tolerably good, has, however, receded several shillings per sack, and Norfolk household has been sold as low as 57s. to 58s. per sack; it is, however, now no longer obtainable at those rates. Though the receipts of flour from America have not been particularly large, the anxiety to effect prompt sales has been very great, and the decline from the highest point attained in January may be fairly estimated at 3s. to 4s. per barrel. For a week or two it was almost impossible to make progress, even at that decline, but since the 20th instant the inclination to purchase has decidedly increased, and at 42s. per barrel for good brands the sale has since been free.

The arrivals of barley of home growth have been more than sufficient to meet the demand. The maltsters and distillers have throughout the month acted with the utmost caution; and it would appear that the high prices for provisions have had the effect of lessening the consumption of fermented liquors. This, at all events, is the impression produced by the evident falling off which has been observable in the demand for barley. Within the

last week the downward movement in prices has been arrested; but, if we compare present quotations with those current at the close of January, we shall find that the decline has amounted to at least 4s. per qr. Should the value of wheat improve (as there is reason to believe will be the case), barley would probably participate in the advance; but we confess that we do not anticipate that the rise in the latter will at present be very important, as the principal maltsters are reported to be well stocked. The arrivals of foreign barley have been only moderate; quite sufficient has, however, come to hand to meet the wants of buyers, the quantity needed for feeding not being so great as earlier in the winter. The decline has not been to the same extent as on English, but purchasers have been enabled to buy 1s. to 2s. per qr. lower than at the end of last month.

Malt has been naturally influenced by the same causes which have operated on the barley trade, and the tendency of prices has been decidedly downwards.

During the first half of the month the supplies of oats were perfectly insignificant; and, though the arrivals have since rather increased, the receipts have altogether been much below the estimated quantity needed for the consumption of the metropolis. Notwithstanding this, the trade has been very dull; and prices have gradually, and almost imperceptibly, receded 1s. to 1s. 6d. per qr. from the highest point. That this should have been the case in the present position of this country as regards Russia is certainly, to say the least, singular. War with Russia—and that we shall go to war now hardly admits of a doubt—would, of course, deprive us of our usual supplies from Riga and Archangel; and from whence we can hope to make good the deficiency we cannot conceive, more especially as the Danish and Swedish ports will have less than usual to ship, and may, perhaps, in the case of hostilities between the allied fleets and the Russian navy, be unwilling to ship at all until the matter shall have terminated. Meanwhile, there is every reason to believe that the stocks of home-grown oats remaining is exceedingly small; and the quantity in warehouse here and at the other principal ports is certainly trifling. These considerations appear to have had some little influence within the last week or two, at least as far as holders have been concerned; and the decline noticed above has been partially recovered.

Beans have met with very little attention, and rather an important decline has taken place in their value; the supply has not at any time been large, but the quantity brought forward has been more than sufficient to satisfy the demand. The fall from the highest point attained in January may be esti-

mated at about 5s. per qr. A few cargoes of Egyptian beans have arrived off the coast, for which it has been difficult to find buyers, though the receivers have shown a disposition to facilitate business by accepting rather lower rates.

The demand for peas has—notwithstanding the return of cold weather, which generally causes an increased consumption—been of quite a retail character; and the tendency of prices has throughout the month been decidedly downwards.

The inquiry for Indian corn, which was tolerably active when we last addressed our readers, has since become slow; and Galatz, after having been as high as 54s., has been offered lately at 52s. per qr., cost and freight, without exciting much attention.

The potato crop in Ireland must have been much less affected by disease last year than was generally supposed; for, though the breadth of wheat grown in the sister isle was unusually small, less Indian corn has been needed than for some seasons past. This may, however, have been partly caused by the favourable result of the oat crop, which has afforded a large quantity of oatmeal, an article of food much used by the Irish people.

Before concluding our remarks, we shall give a glance at the state of the corn markets abroad, in order to afford our readers the substance of our most recently received advices.

Business at most of the foreign markets has, as usual, been materially influenced by the reports from hence. The nearer ports being in direct communication with London by telegraph, have responded to the fall or rise in prices at Mark Lane almost as soon as either has occurred; but this has not been the case with America. With all our improvements, a month is still required before it can be known here what may have been the effect of a particular state of affairs before the sailing of the mail from Liverpool. The full influence of the excitement in the early part of January was, therefore, not felt in New York before the end of that month; prices for wheat then rose to a point they are reported never to have attained before, viz., 2.50 per 60lbs. for fine white Genessee, which, with freight and insurance, would bring the cost here materially over 100s. per qr. The rise in flour was equally great, several unlimited orders having been received from England. The next mail from Europe had a tranquilizing effect, and on the 7th inst. a reaction had occurred; still quotations were at that time far too high, as compared with those current here and at Liverpool, to admit of consignments being made. Shipments had, consequently, fallen off; and after that previously despatched shall have reached us, the supplies from the other side of the Atlantic are likely for a

time to be comparatively small; indeed, if we may credit the reports from thence, stocks had been so greatly reduced by the enormously large shipments to Europe, that some apprehension had arisen whether what was left would prove adequate to meet their own wants up to the period the next crop might be rendered available. The exports from the United States have been almost unprecedentedly large; and it may be doubted whether the stocks remaining in growers' hands can be very heavy.

The advices from the northern ports of Europe are not in general of much interest during the winter months, when shipments are rendered impossible, and business is generally confined to operations for spring delivery. The transactions have been less extensive this winter than usual, owing to the exceedingly light stocks in warehouse, and a fear of making sales which it might hereafter prove difficult to fulfil. At Danzig the entire quantity of wheat in warehouse at the close of the year 1853 was only 4,000 or 4,500 lasts; and the deliveries from the surrounding farmers appear to have been small all through the winter. The quality of the new wheat grown in that neighbourhood is still very badly spoken of, many of the samples weighing only 55 to 56lbs. per bush. The range of quotations was, in consequence of the great variety in quality, very wide, say from 45s. to 78s. per qr.

We have advices of recent dates from most of the Lower Baltic ports. After a period of very sharp frost about the middle of the month, the weather had again become milder; but the ice being of considerable thickness, the opening of the navigation would, it was thought, be delayed to a later period than usual.

From Stettin we learn that stocks of wheat were small, and that a portion of the supply calculated on from Silesia was being diverted to other quarters. A good deal had been bought for Switzerland, where great want was said to prevail. Stettin is, however, one of the cheapest places in the Baltic at present; and good red wheat might be bought there, so as to be put free on board at first open water, at about 66s. per qr.

At Rostock quotations are higher; but purchases might be made even there for shipment in spring some shillings per quarter below the rates which have been paid for what has been taken to finishing the loading of a few vessels chartered during the winter, and which received their cargoes over the ice.

At the near continental ports prices are nearly on a par with our own, less freight and insurance. A few purchases have been made from time to time at Hamburg, principally for Hull account, at from

72s. to 74s. for 58½ up to 60½lb. red wheat. In spring corn very little appears to have been done either for immediate shipment or for delivery in spring.

The Elbe was still full of floating ice; but the steamers had managed to get up and down.

In Holland, wheat is nearly as dear as with us; and there is little prospect of profitable business with the Dutch ports at present.

From Antwerp rather large shipments of wheat were made in the early part of the month for England; but the fall here has lessened the margin, and these shipments are likely soon to cease.

The accounts from France are also of rather a firmer tone than they were in the early part of the month; but the want of money is very great there, and it has been this cause which has led to the forced sales recently made in our markets on French account.

That the wants of France are very great, and that she will have to import before another harvest can be made available, appears to be the general impression there.

The Italian markets, having been rather liberally supplied with wheat and Indian corn from the Black Sea, prices of both articles have of late given way there; still, quotations are higher in that quarter than with us.

At the Black Sea ports, business appears to have been greatly interrupted by the political state of affairs, and the shipments in progress from Odessa and Galatz were not very extensive.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per quarter	
WHEAT, Essex and Kent, white.....	75 to 76	fine 78 86
Ditto ditto new.....	71	fine 78 83
Ditto ditto red.....	70	75 " 81
Ditto ditto new.....	67	77 " 81
Norfolk, Lincoln. & Yorksh., red..	66	74 " 80
BARLEY, malting, new..	40	42 Chevalier.. 43
Distilling ..	38	40 .. Grinding.. 35
MALT, Essex, Norfolk, and Suffolk, new	66	67 extra 69
Ditto ditto old	64	65 " 68
Kingston, Ware, and town made, new	70	71 " 72
Ditto ditto old	68	70 " 71
OATS, English feed ..	27	30 .. Potato.. 30
Scotch feed, new	30	32, old 32 34 .. Potato 34
Irish feed, white ..	29	30 fine 36
Ditto, black ..	25	27 fine 29
RYE	none	— —
BEANS, Mazagan	42	44 " 47 50
Ticks	44	46 " 48 52
Harrow	46	48 " 50 54
Pigeon	46	52 " 54 62
PEAS, white boilers	62	64 .. Maple 47 49
Grey ..	—	— 68 72
FLOUR, town made, per sack of 280lbs. —	—	— " 60 65
Households, Town	65s.	68s. Country .. " 60 62
Norfolk and Suffolk, ex-ship ..	—	— " 57 59

FOREIGN GRAIN.

	Shillings per Quarter	
WHEAT, Dantzic, mixed..	78 to 79	high mixed 81 85 extra 89
Konigsberg	76	78 " 79 " 83
Rostock, new	82	84 fine .. " 87 " 89
Ame i-an, white..	83	86 red .. " 76 80
Pomera., Meckbg., and Uckermk., red	77	79 extra .. 82
Silesian	75	79 white 79 82
Danish and Holstein	74	79 " none

BARLEY, grinding	35	39	Distilling..	41	42
OATS, Dutch, brew, and Polands	31s., 33s.	..	Feed ..	29	31
Danish & Swedish feed	31s. to 32s.	..	Stralsund	30	32
Russian	29	31	French..	none	—
BEANS, Friesland and Holstein	46	50	..	46	50
Konigsberg..	49	52	Egyptian..	47	49
PEAS, feeding	52	57 fine boilers	60	65	
INDIAN CORN, white..	47	50	yellow	47	50
FLOUR, French, per sack (none) —	—	—	none	—	—
American, sour per barrel	38	42	sweet	42	44

IMPERIAL AVERAGES.

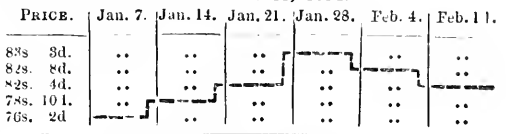
FOR THE LAST SIX WEEKS.

WEEK ENDING:	Wheat.		Barley.		Oats.		Rye.		Beans		Peas.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Jan. 7, 1854..	76	2	41	3	25	5	49	8	46	11	50	2
Jan. 14, 1854..	78	10	42	0	26	4	47	7	48	9	51	7
Jan. 21, 1854..	82	4	42	10	27	2	50	5	48	9	51	5
Jan. 28, 1854..	83	3	43	0	27	1	51	4	48	6	52	5
Feb. 4, 1854..	82	8	41	8	27	0	49	1	48	3	52	6
Feb. 11, 1854..	82	4	41	3	27	4	48	2	47	10	50	3
Aggregate average of last six weeks	80	11	42	0	26	9	49	4	48	1	51	4
Comparative ave. same time last year	45	9	30	8	18	6	31	2	34	9	31	8
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.			Averages from the correspond- ing Gazette in 1853.				
Qrs.	s.	d.	Qrs.	s.	d.		
Wheat....	64,131	.. 82	4	Wheat....	79,428	.. 45	2
Barley....	84,850	.. 41	3	Barley....	81,347	.. 31	5
Oats	20,275	.. 27	4	Oats	21,672	.. 18	5
Rye	186	.. 48	2	Rye	176	.. 30	11
Beans	4,989	.. 47	10	Beans	6,397	.. 34	10
Peas	1,648	.. 50	3	Peas	2,561	.. 31	9

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING FEBRUARY 11, 1854.



PRICES OF SEEDS.

The demand for Cloverseed, &c., for use, has now fairly commenced, and prices are now fully maintained for red Cloverseeds; white seed and Trefoil meet less attention, but are not noted lower. Spring Tares meet a good demand, and the larger varieties are again dearer. Sanfon continues to command full rates. CUTLER & BARKER, Seed Factors.

BRITISH SEEDS.

Linseed (per qr.)..	sowing 62s. to 66s.;	crushing 50s. to 56s.
Linseed Cakes (per ton).....	£10 0s. to £10 10s.	
Rapeseed (per last).....	£30 to £35	
Ditto Cake (per ton).....	£6 15s. to £7 5s.	
Cloverseed (per cwt.).....	(nominal)	00s to 00s.
Mustard (per bush) white new	10s. to 14s., brown old	10s. to 13s.
Corian ler (per cwt.).....	new 10s. to 15s., old	10s. to 15s.
Canary (per qr.)	55s. to 58s.	
Carraway (per cwt.).....	new 42s. to 44s., old	44s. to 48s.
Turnip, white (per bush).....	Swede (nominal)	
Trefoil (per cwt.)	25s. to 30s.	
Cow Grass (per cwt.)	(nominal) .. 65s. to 72s.	

FOREIGN SEEDS, &c.

Linseed (per qr.)... Baltic,	50s. to 55s.;	Odessa, 55s. to 58s.
Linseed Cake (per ton).....	£9 10s. to £10 10s.	
Rape Cake (per ton).....	£6 15s. to £7 5s.	
Hempseed, small, (per qr.)..	00s.....	Ditto Dutch, 42s.
Tares (per qr.)	new, small 62s., large	70s.
Rye Grass (per qr.)	28s. to 35s.	
Coriander (per cwt.)	10s. to 13s.	

HOP MARKET.

BOROUGH, MONDAY, Feb. 20.

Somewhat more business has been doing in Hops of the best qualities, but at no improvement upon recent prices. HART & WILSON.

POTATO MARKETS.

MONDAY, Feb. 20.

SOUTHWARK WATERSIDE.

During the past week there have been large arrivals, particularly from Scotland; and a further decline in prices has been the consequence.

	s.	d.	s.	d.
York Regents	120	0	to	160 0
Do., Shaw's Plants	160	0	—	180 0
Forfarshire Regents	100	0	—	120 0
Fifeshire ditto	90	0	—	120 0
Perthshire ditto	90	0	—	120 0
Reds and Cups	90	0	—	105 0
Irish Whites	90	0	—	100 0

BOROUGH AND SPITALFIELDS.

These markets are well supplied with potatoes, chiefly per railway. Last week's imports were 210 tons from Rotterdam, 5 bags from Rostock, 2 tons from Waterford, 7 from Limerick, 14 from Dublin, and 150 from B.-fast. A steady business is doing, as follows:—Kent and Essex Regents, 130s. to 140s.; Scotch do., 120s. to 130s.; do. cups, 100s. to 120s.; foreign, 110s. to 120s. per ton.

COUNTRY POTATO MARKETS.—LEEDS, Feb. 14: We were well supplied with potatoes, which were sold at 1s. 3d. to 1s. 4d. per score of 21 lbs. wholesale; and at 1s. 5l. to 1s. 6d. retail. MANCHESTER, Feb. 14: Potatoes, from 11s. to 17s. 6d. per 252 lbs.

ENGLISH BUTTER MARKET.

FEB. 20.

We note a dull trade for Butter, chiefly owing to the want of good quality; such as is on offer here submits to lower prices; in fact, buyers may make their own terms.

Dorset, fine weekly	106s. to	108s. per	cut.
Do., middling	92s. to	96s. "	
Fresh, per dozen lbs.	10s. to	16s.	

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	s.	s.	Cheese, per cwt.	s.	s.
Freestand	106 to 110		Cheddar, new	61 to 80	
Kiel	101	108	Cheddar	66	80
Dorset	112	120	Double Gloucester ..	64	72
Carlton	98	102	Single do.	64	70
Waterford	94	1 0	Hams, Fork, new	76	86
Clark	93	104	Westmoreland	72	82
Limerick	86	96	Irish	70	78
Sligo	96	104	Dacon, Wiltshire, green	60	64
Fresh, per doz. 15s. 0d.	18s. 0d.		Waterford	60	61

RELFAST, (Friday last).—Butter: Shipping price, 95s. to 102s. per cwt.; firkins and crocks, 10 1/2d. to 11d. per lb. Bacon, 51s. to 60s.; Hams, prime 70s. to 74s., second quality 60s. to 66s., per cwt.; mess Pork, 90s. per brl.; beef, 105s. to 110s.; Irish Lard, in bladders, 66s. to 70s.; kegs or firkins, 62s. to 64s. per cwt.

Feb.	Butter	Bacon	Dried Ham	Mess Pork
s. d.	per cwt.	per cwt.	per cwt.	per brl.
17.	s. d.	s. d.	s. d.	s. d.
1850.	68 0 75 0	35 0 41 0	63 0 80 0	76 0 77 6
1851.	86 0 90 0	58 0 62 0	69 0 62 0	56 0 58 0
1852.	77 0 82 0	38 0 44 0	54 0 60 0	61 0 62 0
1853.	84 0 92 0	56 0 60 0	70 0 74 0	67 0 60 0
1854.	95 0 102 0	51 0 61 0	70 0 71 0	87 0 90 0

CHICORY.

Foreign root (in £ s. £ s)	Roasted & ground
bound/Hurlingen 10 10 11 0	English
English root (free)	Foreign
Guernsey	Guernsey
York	

HIDE AND SKIN MARKETS.

Market	Hides, 56 to 64 lbs.	s. d.	s. d.	per lb.
Do.	64 72 lbs.	0 2 3/4	0 0	
Do.	72 80 lbs.	0 3	0 0	
Do.	80 88 lbs.	0 3	0 3 1/4	
Do.	88 96 lbs.	0 3	0 3 1/2	
Do.	96 104 lbs.	0 3	0 4	
Horse Hides		6 6	0 0	each.
Caly Skins, light		2 0	3 6	
Do. full		5 6	0 0	
Polled Sheep		8 0	10 0	
Kents		7 0	8 6	
Half-breeds		6 0	8 0	
Downs		5 4	6 4	

WOOL MARKETS.

BRITISH WOOL TRADE.

MONDAY, Feb. 20.

Although the amount of business doing in this market since our last report has been by no means extensive, prices are well supported. When the present series of Colonial sales are over, no doubt we shall experience a revival in trade; but at present dealers' attention is chiefly directed to the sales in question.

	s.	d.	s.	d.
South Down Hoggets ...	1 4	to	1 6	
Half-bred ditto	1 4	—	1 5	
Ewes, clothing	1 2	—	1 3	
Kent fleeces	1 2 1/2	—	1 3 1/2	
Combng skins	1 0	—	1 4	
Flannel wool	1 0	—	1 4 1/2	
Blanket wool	0 8	—	1 1	
Leicester fleeces	1 2	—	1 3 1/2	

LEEDS ENGLISH WOOL MARKET, FRIDAY.—In combng wools, sales have only been to a small extent this week, at prices with rather a downward tendency. Clothing wools are in good demand at firm rates.

LIVERPOOL WOOL MARKET, FEB. 18.

SCOTCH WOOL.—There has, if anything, been rather a better feeling in the trade; but still wools cannot be replaced from the farmers at the rates ruling at present, which gives a firmer tone to prices.

	s.	d.	s.	d.
Laid Highland Wool, per 24lbs.	13	0	to	14 0
White Highland do.	16	6		18 0
Laid Crossed do. unwashed	16	0		18 0
Do. do. washed	18	0		20 0
Laid Cheviot do. unwashed	19	6		21 0
Do. do. washed	22	0		24 0
White Cheviot do. do.	26	0		32 0

LEEDS FOREIGN WOOL MARKET, FRIDAY.—There has been considerably more business doing during the past week. The firmness in price at the sales in London has had the effect of bringing many buyers into the market, who have cleared out much of the old stock remaining.

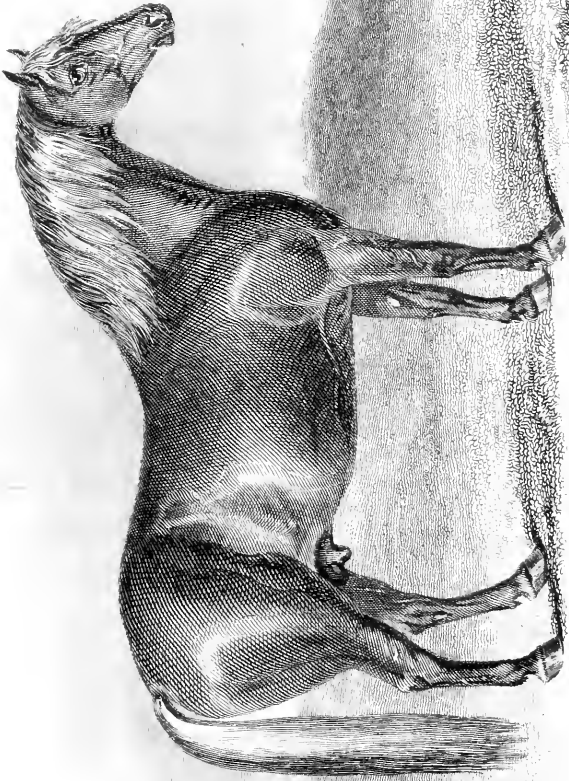
MANURES.

PRICES CURRENT OF GUANO.

Peruvian Guano	per ton	£10 11 0	to	£10 0 0
" D. first class (damaged) ..	"	9 10 0	"	10 0 0
Bolivian Guano	"	9 0 0	"	9 5 0

ARTIFICIAL MANURES, OIL CAKES, &c.

Peat Charcoal	"	3 0 0	"	0 0 0
Nitrate Soda	"	13 0 0	"	10 0 0
Nitrate Potash or Saltpetre	"	18 0 0	"	40 0 0
Sulphate Ammonia	"	18 0 0	"	19 0 0
Muriate ditto	"	22 0 0	"	24 0 0
Superphosphate of Lime	"	6 0 0	"	0 0 0
Soda Ash or Alkali	"	0 0 6	"	8 0 0
Gypsum	"	1 15 0	"	3 0 0
Coprolite	"	4 0 0	"	4 10 0
Sulphate of Copper, or Roman Vitriol for Wheat steeping ..	"	44 0 0	"	0 0 0
Salt	"	1 1 0	"	1 5 0
Bones & inch	per qr.	0 17 0	"	0 18 0
" Dust	"	0 18 6	"	0 9 0
Oil Vitriol, concentrated	per lb.	0 0 1	"	0 0 0
" Brown	"	0 0 1/2	"	0 0 0
Rapr Cakes	per ton	6 10 0	"	6 15 0
Linsced Cakes—				
Thin American in brls. or bags ..	"	10 17 6	"	11 10 0
Thick ditto round	"	9 12 6	"	9 15 0
Marseilles	"	10 0 0	"	10 5 0
English	"	10 15 0	"	11 0 0





THE FARMER'S MAGAZINE.

APRIL, 1854.

PLATE I.

A CART STALLION,

THE PROPERTY OF MR. JOHN WARD, OF EAST MERSEN, NEAR COLCHESTER, ESSEX.

The subject of our plate was bred by the late Henry Parsons, Esq., of Stoke-by-Nayland. He was got by the noted horse "Champion," the property of Mr. William Hern, of Emsett Hall, near Hadleigh, Suffolk, out of a pure Suffolk mare, and was never exhibited except at the meeting of the Royal Agricultural Society of England, held at Gloucester, in July, 1853, where the first prize of Twenty Sovereigns was awarded to him.

PLATE II.

A PEN OF THREE PIGS,

THE PROPERTY OF HIS ROYAL HIGHNESS PRINCE ALBERT.

For which the first prize of Ten Sovereigns and the Gold and Silver Medals were awarded at the Smithfield Club Cattle Show, held in December, 1853.

ON TURNIP FERTILIZERS.

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

The progress of our inquiries with regard to turnip manures is certainly cheering. Our practical knowledge and our chemical researches still seem to go hand-in-hand. Whilst the farmer is experimentalizing in his field, regardless of theory, and justly despising mere fluent chemical verbiage, the man of science is as carefully and as laboriously at work in his study and in his laboratory. As we are now close approaching the season when all our knowledge with regard to the growth of turnips may be profitably rendered available, let us travel together over a few of those fields of inquiry which eminent practical farmers, and as able chemists, have recently traversed.

The labours of the Scotch farmers' clubs are here again most valuable: they are commonly founded

upon some useful system; they are ever based upon the economy of the manure, to its profit to the farmer; and to its consequent commercial value to the community at large. These facts are evidenced in the two most recent reports on the growth of turnips which I have seen, those by the Morayshire, and Lockerby farmers' clubs—districts which the English farmer will remember are, in common with a large portion of Scotland, peculiarly well adapted to the growth of the turnip crop. It is quite true that in the northern portion of our island the climate aids the agriculturists of Scotland to produce much larger crops of turnips than we can commonly expect in England; but Nature's boon in this great respect does not make the excellent Scotch farmers rest satisfied with

their fine crops : they still labour to increase their produce ; for they well feel that there is hardly a limit to the fruitfulness of the soil.

The report of the Morayshire Farmers' Club gives the results of the trials on twenty-five farms in the county of Moray, during the season of 1853-4 ; these being chiefly directed to the economy of using (pretty generally, in addition to from 10 to 25 cubic yards of farm-yard manure) various artificial dressings (*Trans. High. Soc.*, 1854, p. 245). The manures employed were chiefly Peruvian guano, superphosphate of lime, and bones ; the results were decidedly in favour of the use of these fertilizers. The average produce of all these twenty-five farms were found to be, per imperial acre, in 1853-4 :—

	Tons. Cwt
Of swedes	21 11½
Of yellow	18 2
Of common	22 13

In several cases where the dung was omitted, and Peruvian guano and superphosphate of lime and ground bones substituted, the produce of turnips considerably exceeded these averages. To give one instance, that of "Burnside of Speymouth," with the green top, yellow, and white globe turnip, the produce per imperial acre was 25 tons of the yellow, with

Peruvian guano	1 3-5th cwt.
Bones	7 1-5th bush.

And 23 tons 16 cwt. of the white globe, manured with

Peruvian guano	1 3-5th cwt.
Bones	7 1-5th bush.

The report made by the committee of the Lock-erie Farmers' Club is equally valuable, and rather more descriptive. It gives the results of a series of valuable trials on turnip culture, made during the season of 1853-4, upon twenty-nine farms on the middle and upper districts of Annandale (*ibid.*, p. 237). The average produce of these per imperial acre, it will be noted, was rather larger than the average of the farms of Moray. They were

	Tons. Cwts.
Of swedes	21 19
Of yellow	23 4
Of common	27 13
Of mangold wurzel	13 10

The club, however, add, "that partly from the season, and partly from the greater quantity of manure used, and the superior cultivation of many of the inspected farms, the crops weighed would be beyond the average weight of the district, perhaps from 12 to 15 per cent."

The first crops reported upon—that of "Dalton of Hardgrave"—showed the following large results per Scotch acre (Scotch acre 6150 square yards,

English 4,840), each being manured with 15 cubic yards of farm-yard manure, 2 4-5th cwt. of Peruvian guano, and 1½ bush. of dissolved bones :—

	Tons. Cwt.
Swedes, purple top	30 14
Yellow	37 19
White globe	35 9
Hardy green	42 12
Ditto ditto	41 9
Mangold wurzel, golden	18 2
Ditto long red	19 12

"The table shows" (the members of this intelligent club add) "that yearly the quantity of extra manure given is on the increase, and confirms the practice, which is becoming every year more general, of giving bones, either raw or dissolved, along with guano and dung. The great crops at Hardgrave for several years brought this under notice ; and the large weights of all sorts at Dal-fibble, Shaw, and Barnsdale (the two latter at an elevation of 500 feet, and second-rate quality of soil), which appear in the tables of this year, may extend still more the practice of applying bones in both forms."

There appears to be little doubt but that for root-crops, all those artificial fertilizers are to be preferred which abound in phosphate of lime ; not but that it is desirable to have in all these a considerable portion of nitrogenous matters.

Here the researches of the man of science are again invaluable to agriculture ; and much has, within these last few months, been accomplished in this way. Great advances, indeed, have been recently made towards a better understanding of the theory of manures. If any young farmer doubts the advantages of treading cautiously in all practical experiments—looking steadily to Nature's lessons, but not unmindful of her truths developed by the chemist—if he has any such doubts, let him contrast the vague experiments of Arthur Young, and of the farmers who were his contemporaries, with the similar practical inquiries of the modern agriculturist.

It is now about three-quarters of a century since the ardent and enthusiastic Arthur Young was employed upon some trials with manures, "in order to discover," as he gravely tells us (*Annals of Agriculture*, vol. i. p. 139), "what would be the effect of bodies greatly charged with phlogiston" (phlogiston was the name given to an imaginary substance of that day by those who thought that mere words were useful as an explanation of unknown facts). These experiments, were commenced in 1779 ; he carried on his trials chiefly in small garden-pots of earth for a lengthened period, manuring with all kinds of substances. Thus we find him using (*ibid.*, p. 151) charcoal powder,

sulphuric acid, spirits of nitre, muriatic acid, spirits of wine and train oil, carbonate of ammonia, sulphur, barilla, salt of tartar and spirits of nitre; and as he used "a poor sand" for his soil, these additions all failed to answer any good purpose to the barley with which the pots were planted; but when in the following autumn the pots were resown with turnip-seed (*ibid*, p. 153), then the sulphuric acid and the charcoal answered better.

In subsequent pages he recounts his trials with nitric acid (*ibid*, p. 163); and a quarter of a century after this he was still going on, feeling his way with the effects of a great variety of similar applications (*ibid*, vol. xlv. p. 314). Poor Young, whose good sense and untiring zeal almost supplied the total absence of correct chemical knowledge of his time, laboured hard in many a useful direction. He seems every now and then to be on the very point of making valuable discoveries, which were reserved for our age. He felt, however, and lamented (*ibid*, vol. i. p. 169) his want of the chemist's aid. He had neither a laboratory, nor even a proper place to keep his experimental pots free from accidents—unfortunate chances! which, as Young ingenuously recounts them, sometimes border on the ludicrous. For instance, he tells us (*ibid*, vol. i. p. 162): "a carpenter, letting a piece of timber fall upon the pots, while putting up a bench, broke some, and tumbled the rest over. Here, therefore, ends this trial."

How refreshing it is to turn from these small, unsystematic trials, to the far more scientific and useful researches of the modern farmer labouring in his fields, with the light of chemistry to guide him! Only contrast, for a moment, Arthur Young, the great agricultural improver of his day, labouring in his abortive experiments with nitric and other mineral acids—compare these, I say, with those on nitric acid recently described by the President of the Royal English Society (*Jour. R.A.S.*, vol. xiv. p. 375), and let the young farmer draw from them the useful suggestions which they so well afford. Speaking of the nitrates of potash and soda, Mr. Pusey remarks:—

"This substance, or rather these substances—as there are two, the ordinary and the cubic saltpetre—consist of an acid, the nitric acid, and an alkali, either potash or soda: nor could any one, viewing the effect of these individual salts, decide whether the acid or the alkalies were the source of their manuring action. Looking, however, to the nature of other fertilizing matters, I ventured, so long ago as the year 1841 (*Jour. R.A.S.*, vol. i. p. 123), to express the belief that their power would be found to reside, not in their alkalies, but their acid. Still the arguments then adduced were not

thought conclusive, and in books subsequently published it was yet said that the potash and the soda very probably were the manures, for the mineral theory was still in vogue.

"Last year, having some fresh facts to bring forward on nitrate of soda, I endeavoured to support the same view, by showing further that other nitrates also, such as the nitrate of lime found in old walls, have likewise a manuring effect.

"Still the question has remained open, and the highest chemical authority in Edinburgh has recently questioned the manuring power of nitric acid; nor can any one blame that distinguished philosopher, Dr. Gregory, for exercising caution in admitting such an hypothesis. For if it be true that all substances containing nitrogen, in whatever form, are thereby constituted manures, this will not be a mere rule of farming, but an important law of vegetable physiology—the more important, perhaps, because we hardly know any other law under which vegetables acquire their substance, excepting that by which they absorb carbonic acid in daylight. Indeed, his opponent, Dr. Wilson, in an able paper read before the Royal Society of Edinburgh last spring, advocated the efficiency of nitric acid with some hesitancy, admitting that 'soda might be the more important constituent of nitrate of soda considered as a fertilizer.' So long, then, as the productive power of nitric acid rested upon abstract reasoning, however cogent, the general law could not be regarded as finally valid. It appeared, therefore, desirable to bring the matter to a decisive experiment, and by employing the two elements of nitrate of soda, the acid and the alkali, separately, to ascertain in which of the two the manure virtue is seated. It would be scarcely possible, of course, to use nitric acid upon acres of land; nor did it seem necessary, for we know the vivid green and the rapid growth induced upon grass by nitrate of soda. Whichever, therefore, of its two elements used side by side with itself, the alkali or the acid, produced the same vivid green and the same rapid growth, must clearly be the active principle of the combined salt.

"In applying nitric acid for the first time as a manure, whatever confidence one might entertain in a scientific induction, one could not see the most powerful of acids eating away the very spoon which held it, or feel its acrid fume in the lungs, without some misgiving as to its action upon the tender spongioles of the grass's roots. Considerable dilution was of course necessary, and the first point to be ascertained was the amount of water required to be mixed with the acid for the safety of the living fibres. Six stripes, then, each five feet long and one broad, having been marked out by pegs upon a grass plot, these received severally, from a water-

ing pot, a pint and a-half of water containing nitric acid, the proportion of which was successively decreased. Two other stripes also received nitrate of soda in different quantities. The three strongest doses of nitric acid had burnt up the growing grass by the following morning, but, to my great satisfaction, in about a week the next stripe showed unequivocal marks of benefit from the nitric acid. Soon after, one weaker solution had begun to act. It was only the weakest dose of all which produced no effect. The three strongest, too, had killed the blades alone of the grass, not the roots, which in about a fortnight sent up a new crop of deeply-discoloured herbage, resembling that produced on their side by the nitrate of soda. The quantities of acid applied are given in the following table:—

SEPTEMBER 22.

Manure employed on Area of 5 Square Feet.	Quantity in Drachms.	Water in Pints.	Effect on Grass, in perfection being taken at 10.
Nitrate of soda (dry salt)	6	1½	10
Ditto	3	—	9
Nitric acid of commerce	8	—	8
Ditto	6	—	8
Ditto	4	—	8
Ditto	2	—	8
Ditto	1	—	2
Ditto	0½	—	0

“At this time, November 15th, the effect of the waterings is still very conspicuous, the grass so treated being not merely darker, but thicker; and three times longer on the best lots than on the adjoining turf.

“Having thus discovered that nitric acid did act, and having ascertained the safe dose, I made two further trials, which included the alkalies separately, soda and potash, and also included ammonia to serve as a further test. In both trials the nitric acid acted decidedly. The alkalies, neither of them produced even a trace of effect on the colour or on the growth of the grass:—

OCTOBER 3.

Manure employed on Area of 5 Square Feet.	Quantity in Drachms.	Water in Pints.	Effect on Grass, in perfection being taken at 10.
Nitrate of soda	6	3	10
Nitric acid	4	—	8
Ammonia	1½	—	5
Soda	1½	—	0

OCTOBER 4.

Manure employed on Area of 5 Square Feet.	Quantity in Drachms.	Water in Pints.	Effect on Grass, in perfection being taken at 10.
Nitrate of soda	6	1½	10
Ditto	3	—	5
Nitric acid	2	—	7
Ammonia	1½	—	5
Potash	3	—	0

“The success, therefore, of the experiment was complete. The question being whether in saltpetre the alkalies or the acid contain the active principle, we have found upon a given soil the alkalies absolutely inoperative, while the acid has acted

exactly like saltpetre itself and like ammonia. The action, indeed, does not follow any precise proportion to the quantity of nitric acid employed, but neither does it to the quantity of saltpetre. For both, as is the case with other manures, there is no doubt a maximum, to exceed which is useless, and may even be prejudicial. But the action of the nitric acid was palpable, unfailing, and indeed very powerful. On many other parts of the grass-plot sprinklings of the diluted acid were poured, and were everywhere followed by a dark, luxuriant vegetation. We may now therefore assume, with unhesitating certainty, as a great law of nature, that substances strengthen vegetation mainly by their contents of nitrogen.

“This law sheds at once an harmonious light over the scattered facts which the unlettered husbandman has learned while still groping in the darkness of practice. If we look at the practice of manuring only, we find the most dissimilar, substances applied to the soil—sprats or sticklebacks here; woollen rags, or shoddy, or horn-shavings there; sea-weed in another place; rapecake elsewhere. All these refuse matters, however, agree in containing undeveloped nitrogen. Again, lupines, sown for the purpose, are in some countries ploughed in as manure, as are the remains of the clover crop, both also containing nitrogen undeveloped. In dung and in liquid manure the nitrogenous matter is partly combined with hydrogen, and has thus become ammonia. In other manures, as soot and gas-water, the pungent smell shows the full development of ammonia. Again, nitrogen may combine not only with hydrogen to form an alkali (ammonia) but with oxygen also to form an acid. That acid, in whatever combination, whether with potash, soda, or lime, is equally active; nay, as I have now shown, the consuming liquid itself is able to nourish the tender herbage of the green lawn. This same law explains, moreover, not fertilizing substances alone, but the fertility of the soil itself also throughout many wide tracts. Not only are the plains of Hindostan made fruitful by their native saltpetre, but the famous *techornoi zem* (black earth) which over wide tracts around Tamboff bears wheat crops in endless succession, and will not endure to be dressed with dung, has been found by late analysis to be charged with nitrogenous matter, the remains of living organisms. Nay, when poets tell us that battle-fields are rendered fertile for ages by patriot blood, we now understand scientifically this mournful memorial of human slaughter.”

Researches like these will not be unheeded by the present generation of farmers. The retrospect of what has been already accomplished will warn them against believing in any of those idle asser-

tions that are sometimes hazarded as to the perfection of modern systems. The steady and hardly ever interrupted advances which have been already witnessed in agricultural knowledge will rather

serve to well assure them that greater things are yet to be accomplished, larger harvests yet to be secured, than any we have yet been blest with.

WHAT SHALL WE DO WITH OUR WOODLANDS?

What shall we do with our woodlands? Let not our readers be alarmed; we will not inflict on them an article on the Royal Forests, their ponderous blue books and their conflicting reports. We will not discuss the policy of retaining thousands of acres in a condition very similar to that of the wilds of Australia—only less productive and more complicated with conflicting claims and expensive management—in order that timber may be raised for our dockyards, which, for some reason best known to themselves, the dockyard authorities will not use. Neither will we inquire whether oak adapted to naval purposes is best raised from the acorn on the spot at which it is to reach maturity, or whether it should be transplanted several times, and finally placed out as trees four or five feet high, with stems as thick as walking-sticks. We will not inquire whether the British oak, which braves the battle and the breeze when it reaches maturity, is less able than it was, from the days of Rufus till the nineteenth century, to bear the breeze in its infancy; whether it requires to be swaddled and dandled into a timber tree; whether, if nurses are necessary, its old native companions the beech and the holly are sufficient, or whether their place will be better supplied by exotic nurses, and whether, of these, the Norway fir, the larch, or the deodar is to be preferred. We leave these questions to the commissioner in charge, to the Lords of the Treasury, to their deputy-surveyors, and to parliamentary committees.

It is to the woodlands on the entailed estates of individuals that we wish to draw our reader's attention. How the owners of such estates may be relieved from those disabilities which prevent them from improving their old woodlands, by converting portions of them to tillage, and so managing the remainder that part shall for the future be more productive of timber and of money than the whole is at present. These are questions of great public and private interest at all times: they acquire tenfold importance at the present moment, when, after forty years of peace, we are entering on a new war, which may be of as long duration as the last, and may again throw us upon the resources of our own soil for a supply of food for an increased and increasing population, which has become, from year to year, more and more dependent on foreign supplies of grain and of animal food.

The subject has been brought under our notice by the casual perusal of a letter on the Woodland Question, which Mr. Bailey Denton addressed to the Inclosure Commissioners in 1852, and which he has since published.

He begins by stating the case of a landowner, a client of his, possessed of about 30,000 acres in our southern counties, of which about 3,500 were unproductive woodland. It had become unproductive from several causes. The timber had been exhausted by the usual periodical, and occasional extraordinary sales, without any due provision being made by former owners for the growth of a succession; by the general introduction of squared foreign timber, and by the preference which builders give to it; by the low price of oak-bark; and lastly, by the extension of the railway system, which by reducing the price of coal in inland situations has caused it to supersede, in a great degree, underwood and topwood as fuel in such situations.

Under these circumstances, the average annual returns of these 3,500 acres, in timber, bark, and underwood, for six years, have barely covered the annual parochial and other charges, the expense of maintenance, and the cost of felling, peeling, and selling. It had thus become valueless, except for sporting purposes. The cost of supervision exceeded that of all the rest of the estate; and it entailed on the neighbourhood the social evils attendant on woodland, such as petty trespassing, poaching, and wood-stealing, which increased in proportion as the woods became less remunerative. The annual expense of prosecuting poachers and woodstealers has varied from £15 to £150 per annum. Under these circumstances, Mr. Denton, having been consulted by the owner as to a remedy, gave the following as the results of his investigation:

1. That the woods were as remunerative as they were represented.
2. That the soil of the greater part was naturally fertile and capable of profitable cultivation if properly converted into arable or pasture land.
3. That it would be inexpedient to replenish the existing woodland; because sufficient timber-trees could be planted and raised more profitably upon much less land, and with more advantage to the rest of the estate.
4. That by retaining 800 acres of those woods which exhibit the best signs, by growing vigour, of a prospective yield of timber for the next 50 years, much more than sufficient

timber for the repairs of the estate would be supplied by the reduced area, with a better average return per acre, while the newly planted portions should be reaching maturity. 5. That there would remain 2,700 acres fit for cultivation, equal in value to the adjacent lands, which vary from 16s. to 26s. an acre titheable; while these 2,700 acres would command, when cleared and drained, and provided with good homesteads, a higher rent in consequence of the tithe having been permanently commuted on this land as woodland at 1s. 2d. an acre. For these reasons, he estimated the rental of it, when thus improved, at 26s. the acre, or £3,500 per annum.

The cost of clearing, draining, and dividing the 2,700 acres, Mr. Denton estimated at £15 on an average, increased to £17 by the cost of trenching or double ploughing, so as to give the tenant every advantage. The cost of planting 270 acres, or one acre in ten, he estimated at £4,250, including fencing, draining, and trenching. After certain additions to existing farms, the grubbed and cleared woodland would be divisible into five good occupations, requiring houses and homesteads, which would cost £10,000. From this outlay there would be £35,450 to be deducted, as the estimated present value of the timber and underwood varying from £10 to £17 an acre, and averaging £3 10s. This brings the outlay down to £18,300. The annual income is estimated at £3,000, or 2,700 acres at 26s. per acre, as shown above, less the rent of the newly planted land, with 12s. 6d. an acre for tithe rentcharge, rates, &c., payable thereon. Such being the prospects of returns for improvements, impediments to it arise from the entail, which renders the owner liable to impeachment of waste at the suit of the succeeding owner, if he should enter on a work so beneficial to the estate. Under these circumstances, Mr. Denton having been consulted, recommended an application to one of the Land Drainage and Improvement Companies, provided the Inclosure Commissioners should be of opinion that the improvement could be of a permanent character, and provided the Acts of those Companies gave them power to execute such works. He calculated that

the outlay of £18,300 would be swelled to £20,000 by the costs and contingencies attending the operation; that it might be liquidated in fifty years, by an annual charge on the inheritance of £4 13s. 1d. per cent., or £930 16s., which deducted from the improved net income of £3,000, would leave a clear annual profit of £2,069 4s., in addition to the proceeds of 270 acres of fresh-planted woodland, the timber of which would be at its most profitable growth at the expiration of the charge, and worth above £20,000 for the benefit of the owner then in possession, if properly preserved in the meantime.

The advantages of having recourse to a public company, acting with the concurrence of the Inclosure Commissioners, in preference to a private compact with the succeeding heir, even though he should be favourable as in this case he was, to the conversion desired by the present possessor, are stated to be the following.

Such private compact would necessarily limit the outlay to the amount which might be realized from the timber and underwood, and thus defeat the more perfect improvements contemplated of draining and the erection of homesteads which are essential to profitable management. In the next place, by having recourse to a public commission, the transaction would be publicly recorded, and that would be conclusive legal evidence that the income of the estate had been benefited to the extent of £2,000 a year, without any appreciable loss to the inheritance.

The Inclosure Commissioners were of opinion that in the case of unremunerative woodland, there is no power to carry out such improvements under the Private Companies' or any public Acts of Parliament.

We shall be glad to learn the result—whether this unremunerative 2,700 acres remain in *statu quo*, or whether they have been improved by means of private compact with the next heir—whether there are many such cases, and whether Mr. Denton has any legislative remedy to propose. We conclude by repeating the question with which we commenced, What shall we do with our woodlands?

AUTUMN-CLEANING A REMEDY FOR COUCH.

“Will you be so good as to invite your correspondents to give a struggling farmer their best advice, how best to rid himself of couch *alias* twitch, which has struck its roots considerably below the nine-inch furrow into the miry clay beneath?”

Such was the enquiry addressed in this journal of the 13th, and as it expresses the state of thousands of farmers—as it pre-supposes much both to adduce and to deduce in agricultural practice—we cannot

help entering into this query beyond our wont, in order to assist “A Struggling Farmer” to prevent and to remedy this improper state of things. And, first, our friend has not been quite up to the mark to allow the couch to get thus deep. He is not an autumn cleaner. If he, or any other observer at all interested in the subject, will examine the roots of the couch at harvest time, he will find that they spread horizontally, and near the surface of the soil. In the

struggle for oxygen, of which they are so fond, both leaves and roots, keep the nearest to it possible, on the same principle as trees in a plantation struggle upwards instead of striking out numerous lateral branches. But no sooner is air admitted, than the points begin to direct their heads downwards, and the growth from that period till perhaps Martinmas, or even, in an open season, Christmas, is perpendicularly downwards. It is, then, between harvest and the present time that these couch roots have grown out of the range of our correspondent's ordinary cultivation, and caused him all this difficulty and these struggles, which every farmer has at one period or other of his life to make. Had the scarifier been set to work ever so thinly after harvest, the downward progress of the roots would have been arrested, and a few slight harrowings last autumn, so favourable for such work, would have diminished the anxiety about their removal, and the terrors of missing a season this year have been materially mitigated.

Nor can we help drawing another inference from our friend's question, which may help him and thousands like him; and that is, that he might have ploughed a little deeper than nine inches. Possibly he was afraid of bringing up the miry clay from beneath the surface, and so injuring his crop—was fearful of the vegetation suffering from this, and so he kept it down. Take courage. The couch, it is plain, has a different view of the case: it has no fears: it thrives in it, showing that the plough might have brought up three or four inches more of this clay, exposed it to the action of winter frost—washing of winter rain and snow water, and thus assisted in deepening the soil for all future crops.

Clay is now proved to be a means of detaining manure. It is the best of all tanks; for it voids the mere water, and holds the manure. It is the safest of all modes of saving liquid manure, whether direct from the fold-yard, or from the heavens in ammoniacal matter from the atmosphere; and therefore if our friend has now 900 tons of soil on his land per acre, he would by ploughing three inches deeper soon have 1,200.

But what must he do now? What must the thousands do, who are similarly situated? If it is not yet ploughed, just venture to take a Ransome, a Howard, or a Busby's plough, and go below the couch. Never mind if the miry clay is brought up, though we would rather have seen it at Michaelmas than at Lady-day. The frosts and cold winds and hot days we shall yet have, before sowing time in June, will permeate the mass, will evaporate the moisture, will partly disintegrate the soil, and the couch may be expected to die. But do all he can, the soil will at sowing time be one great mass of clods. If the weather be dry, and warm enough

to do this, it may not now be frosty enough to break up the clods. But the clod crusher—say be it Crosskill's, or Cambridge's, or Gibson's, as we last week hinted, we care not; only let the clods be broken up to powder when dry, and if the couch be not killed, a little dragging with Finlayson's or Coleman's harrow or Kirkwood's grubber, or any of the fashionable drags, will soon set that right. And what if the whole clay soil be thus a mass of dry powder in June? Now, as we before said, with Chandler's or Kemp's water drill, we need never fear a crop of turnips.

If, however, the land has been ploughed already, the course may not appear so easy; but with a little trouble it is still a practical process. Let a plough be sent to turn the old furrow back again. Then let this be followed by a narrow and sharp-cutting implement, like Barrett and Exall's Liverpool one-horse plough—this will bring up the subsoil, and throw it to the surface on the top of the old furrow; and a little dissolved guano, or a few extra dissolved bones, will make all the difference in this clay; and long before a corn crop is sown, it will have ceased to be miry clay, and become *fresh* soil.

Some farmers will smile at us if we say it is the easiest thing of all not to grow couch. But it is the easiest thing possible to do, nevertheless. This couch represents the difference between allowing the green crops to exceed the grey, and allowing the grey to exceed the green, or in some soils to equal them. The presence of abundance of couch is an indication that the soil has been cropped too far. We fear this will be an unpalatable doctrine with corn at 80s. per quarter; and we do not say that no land ought to be cultivated in alternate husbandry, which has couch after the last crop of the course. But we do say that while a four-course shift will keep light loam clean enough for all practical purposes, the peaty and blowing sands, grey, yellow, and red, will always be more or less infested with couch after a four-course rotation is concluded. It is true these soils are happily soon cleared; a little autumn scarifying will generally finish this matter for them; but if the growth of couch is to be absolutely prevented, a corn crop after seeds should not be grown without the intervention of a bastard fallow.

Following up our remarks on cleaning, we think few soils will require this spring any cross ploughing whatever. The frost has so pulverized the furrows, and the dry winds so loosened and lightened the soil, that the drag-harrow may be at once set in, and the whole broken up easier than a ploughing might do afterwards. If it is first harrowed so as partially to break the surface of the furrow slices, the dragging of the fallows will be an easy operation.

PREPARATION FOR SEED-TIME FOR BARLEY AND TURNIPS.

The peculiar character of the weather of this current February and March is such as to be neither very good nor very bad for agricultural operations. It may operate just the one way or the other: it may assist the farmer, or it may diminish his prospects of a fair and profitable year. The "peck of March dust," so valuable as to have run into a proverb as old as the most ancient of agricultural treatises, may be accompanied by bleaching winds and dry frosts, so as to throw out the young wheats, and to render promising fields deficient of plant, or patchy. The open weather may be over before much is done to the spring fallows for turnips, and rain succeed at a time when they should be worked or cleaned. The fine dry seed-time may end, on the other hand, in a cold parching drought, which may too long defer the seed time, and so render the prospects of a fine spring perfectly nugatory.

We feel it our duty to say a few words at least on the two operations of preparation for the seed-time for barley and the seed-time for turnips—suited to the several phases the weather may put on, and in order to make the farmer take the most advantage of his present position.

The barley is a plant which, for successful cultivation, requires neither a very light nor a very strong soil. If the soil is light, it must have a certain measure of consolidation, artificial or natural, arising either from the eating on of turnips, or the consolidation of seeds or white clover roots. It is impatient of oxygen to its roots; but it requires a very fine soil to cover it. A strong soil, well pulverized, will grow a good crop of barley; but if cloddy, on the same soil it will be a failure. The roots are tender on the one hand, and cannot press their way, like the wheat roots, through solid clay. A solid substratum must be made for them; but it must not be deep; and the particles of the soil must lie close together. This is the natural condition of the soil most suited, and indeed absolutely necessary, to the successful cultivation of barley.

Now all turnips eaten on in the wet month of December will leave the ground sad and solid—too closely consolidated, indeed, for successful barley-growing; but such as was ploughed up immediately—as it is called in Norfolk, "ploughed close to the *teathe*"—will have been comminuted by the frost so completely as to present a fine surface; and it is dangerous just now to disturb this by too much working till the whole of the capillary

moisture is evaporated. It is far better in this case to harrow first: this will leave it fine, and break all the clods rendered tender by the frosts of January and February. Another ploughing should, if made, be followed rapidly by the harrow, to keep in the moisture, and so to leave the barley in a state fit to germinate when drilled. If too much worked, and a great deal exposed, the moisture will be lost; and if rain should not supervene, the barley may easily germinate at twice; or even spring a germ and die: in the former case it will ripen unequally, in the latter will be partially destroyed.

Great as this danger may be, we have no hesitation in saying it is far better to drill the barley dry, and leave it for rain to follow, than to put it in after rain may have come; and decidedly the best prospect will be for the farmer at once to sow and expect the rain, taking pains not to waste too much of the moisture. For the same reason the harrows should follow the drill immediately, and the roller follow them, to seal up the little dampness which may remain in the soil.

If there is a little only of this, it is safe to steep the barley all night in water, and dry with a little lime, so as to make it pass through the drill readily; or a twenty-four hours' steep may be given, if there is simply a condition of the soil sufficiently moist to stimulate a continuance of the germinating process.

But with much of the land for barley, where the turnips may have been eaten, say for the last few weeks, the soil is hard, as if baked like a brick, and it requires no ordinary plough to enter and break up the land. In this case it will be inevitably cloddy. Cloddy land having a large surface exposed to the atmosphere, will soon lose the whole of its moisture; and hence mechanical means must either be at once resorted to, or the rain must be waited for with patience. What is done, however, must be done quickly. One of the favourite clod-crushers must be sent immediately after the ploughs; we care not whether it be Crosskill's or Cambridge's or Gibson's; any one will do this work, were one even called upon to say which is the best for other and more difficult operations. A few gentle harrowings afterwards will effect the three objects essential to the successful management of barley. There will be the solid soil and sub-soil; there will be the fine surface produced while the clods are soft, and before too much exposure has baked them into as many bricks; and there

will be the little moisture sealed in, to be kept in store for the universal malt-making of a genial spring day.

And if all the moisture should go—what farmer has the courage?—let him use the new thing under the sun (the *water-drill* of Chandler or Kemp), and drill a little liquid manure, or even common water, or not too strong salt-and-water, and it may answer his purpose. A little adaptation of the drill, which any machine-maker can put in, will do

the whole; and though it has not in our recollection ever been tried, it is one of those theories from analogical reasoning which from the very nature of things *must* necessarily answer the end proposed.

A bad crop of turnips, or a large number pulled off, may thus have a small dressing of dissolved guano or nitrate, to help the crop; for plants can no more live without water than animals.

IRELAND AND THE LAW OF SETTLEMENT.

Ireland is still our great difficulty. We have been taught so long, indeed, to consider her in this light, that we become at once alarmed by the introduction of any claim she may have to make. On her entrance, like the inopportune arrival of a troublesome friend, we shut up our books, with the full conviction that no more business can be done to-day. We might very possibly have gone on for some time longer, arranging our own affairs and making our own household more prosperous and comfortable. But what are we to do for such a Mar-plot? Really if you insist upon our putting your house in order too, we are afraid we shall be compelled to abandon our efforts altogether, and let matters go on as they have been going. You have been in such a terrible mess, and you have such a name, that little short of failure could be expected from our taking you into partnership.

There are many honourable gentlemen in the Lower House, just at present, in this way of thinking. The great difficulty, after all, to Mr. Baines' projected abolition of the Law of Settlement, is Ireland. On the publication of his scheme, the Irish members, it appears, paid him the highest compliment it was possible for them to offer. They said, "in this advantage you are going to confer on the labour market, why leave us out? Give our people the same opportunity of making the most of their industry. It will surely sound unfair when we come to find that the Englishman is *not* tied down to one certain limited field for the employment of his means, but that the Irishman *is*." It was not easy to answer, or at least to refuse such a prayer as this; and we hear accordingly of a promise having been already given that Ireland shall have the same extended liberty of action it is proposed to effect for England. And on this announcement the whole plan comes to a dead lock. Gentlemen, such as Sir John Pakington, influenced by no party spirit, and whose very position make them good authorities on the subject, are willing enough to give their support as far as England

and Wales are concerned. But Ireland, "Oh, sir, that makes it quite another thing!" We were not prepared for this; and honourable members, in the full flush of their fears, straightway picture overloaded steamers arriving in rapid succession, charged with the pauper population of the sister kingdom, "to be delivered immediately" to the union workhouses of this country.

The Irish labourer has not always been so unwelcome amongst us. There are occasions when we are even now glad enough to have his services; and it may come that we shall be still more ready to receive him. If the inducements to emigrate continue—if the necessities of war yet further call upon us, we may not find ourselves over-flooded with any amount of labour that even Ireland could supply. We would have it, however, as we yet use our more immediate neighbour from the next parish or two—to send it back again as soon as we had done with it. The rights of labour and the rights of property are certainly very different matters.

We believe, for our own part, that the Irish labour market was never looking better than it is now. We do not think that men have the same general need to fly their own homes, and we are consequently inclined to estimate these fears as to any inundation of pauper Irish as next to groundless. We are apt to judge of that country too much by the past, whereas there is enough to warrant our assuming for it a far more prosperous time to come. Beyond this, justice demands that we should give to others under our care the same opportunities we are making for ourselves. As a matter of justice, they distinctly demand this of us, and, we repeat, it will be difficult indeed to refuse them. For many reasons it will be better, as contemplated, to meet the claims of Ireland with a separate Bill especially devoted to them. There must be some certain provisions—such as the non-expatriation of the aged and infirm—that could only clog the Act as intended for this part of the king-

dom, and encourage an opposition that we are assured will not otherwise be offered.

This announcement of the Government's attention to the wishes of the sister kingdom was, as we have stated, the one general impediment to the further progress of the Bill when it came on for a second reading on Friday night. The occasion, however, was taken for some further objection to the measure as originally introduced. As was well said by Mr. Kerr Seymer, "there seems to be an apprehension that if this bill passes into law, the result will be that a great portion of the population of the country will become vagrant." The remark, though, applied to a petition that had been presented from one of the metropolitan parishes, was as fully warranted by what took place in the House. Town and Country once more were at war with each other, and sundry arguments adduced to show how both would suffer from the proposed alteration. Lord Dudley Stuart, for instance, knew "it would cause a very heavy burden to be thrown upon large towns, and very unjustly; because, if people thought they could come to large towns and throw themselves upon the poor-rates there, and if there was to be no power of removing them, we must be prepared to see, at different times, an immense influx of these poor persons, and a consequent immense increase in the rates, with the impossibility of these rates being afterwards diminished." Whereas Mr. Knight, the member for Worcester, after asking himself "What would be the effect of abolishing the Law of Settlement?" proceeded thus to show it:

"If such a law did not exist, suppose that a large proportion of the population of a manufacturing town were out of work for a long period, they might easily be driven by harshness and severity to the agricultural unions throughout the country.

To those unions they would resort by fifties and by hundreds, and they could only be repelled by harshness. Let the House consider what would be the effect of such a proceeding upon the rate-payers. If the population of a manufacturing district chose to strike, they would easily learn in what districts workhouses were empty, and they might quarter themselves upon those districts, thus ruining their masters at the cost of the rest of the community."

Lord Dudley and Mr. Knight were two of the strongest opponents to the second reading; and it is amusing to find how they answer each other. This doing away with a man's settlement will not be such a very unfair proceeding, after all—even admitting, as it was very handsomely put, that the labourer will only travel the country for the purpose of seeing which union he may like best.

We shall carefully watch its progress, and have only to hope that the consideration of the measure will be kept more closely to its first intention. Ireland must be the subject of another Bill, which may come appropriately enough as a *sequitur* to this. However much her claims may have interfered here, our thanks are at least due for a discussion in which there was something to congratulate ourselves upon. The best of this good news was, perhaps, an assurance from Mr. Christopher, who, combating a rather popular error as to the effect of our present system, declared that, "where cottages were wanted they were built: it was a matter of supply and demand." We are afraid there is a great deal of evidence on record to the contrary, and that where cottages are wanted they are too often (for built) *pulled down!* If it is simply a question of supply and demand, it is certainly one that so far has been very curiously worked out.

COOKERY.

We urged in a former article the importance of instruction in cooking, among the common things which the public are now, though rather slowly, beginning to see the necessity of teaching; and we are happy to find that our views have received the approbation of some of the most influential of our contemporaries of the daily and weekly press. We endeavoured on that occasion to show the benefits which would result to the higher grades of society if the females of that class which supplies them with domestic servants were skilled in the art of common cookery—if the wives and daughters of the middle classes devoted rather more time than at present to the superintendence of their kitchens,

and possessed sufficient practical knowledge of the culinary art to be able to instruct young and inexperienced servants. We are now to consider the advantages, moral as well as physical, which the peasantry themselves would gain if such practical knowledge could be established on their own hearths. Man is a cooking animal: the more he advances in civilization, the more he cooks; and, *e converso*, the more he cooks, the more he advances in civilization. At the lowest point of the savage state, he devours raw fruits and roots—the spontaneous growth of the forest—and tears, like a wild beast, the bloody and quivering limbs of such animals as he can catch. At a more advanced

stage of the hunter-state, he kindles fires, and has recourse to simple but ingenious contrivances of heated stones and earth-ovens wherewith to bake or broil his animal and vegetable food. In the pastoral or roving state there are more culinary processes: he lives on the flesh and milk of his flocks and herds—he prepares butter and cheese—“he roasteth roast, and is satisfied.” At the lowest stage of the agricultural state, or state of fixed-habitations, man commences with parched corn, and advances to bread. As civilization proceeds, with its concomitant luxuries, the art of cooking is abused, by being made to minister solely to the gratification of the palate, to the injury of health; the promotion of which, by facilitating digestion, is the legitimate object of the culinary process. Again, if we look into the history of the art of cookery, it will be found that its first essays consist in roasting or broiling; a more advanced civilization must precede boiling and stewing, because those processes require a more complicated apparatus. Before man can boil, he must have made a vessel capable of holding water and of bearing exposure to the fire. While in this highly civilized country the use of cookery has degenerated among the higher grades of the community into its abuse, the diet of the English rural labourer has not advanced beyond the lowest point of the agricultural state of society—bread and cheese in seasons of prosperity; dry bread in times of adversity. Till the potato blight became perennial, that root was establishing itself in England as the exclusive or principal article of food, and was rapidly tending to produce there the evils with which it had afflicted Ireland. It is on record in the Parliamentary blue books that the labourers of Sussex were accustomed to carry cold potatoes to the field as their only dinner, with water for their only beverage. In that respect the Irish peasant had the advantage, for his potatoes were eaten hot in his own cabin, and he “kitchened” them, as he called it, with butter-milk. “How do you manage,” we asked a Norfolk labourer, during the high prices of 1846-7, “to purchase bread for so many children with your wages?” “It will never do,” was his reply, “to feed them on bread; we fill them well with potatoes before we set the loaf before them.” Even now, notwithstanding the severe losses which they have experienced from the repeated failure of the crop, the English peasantry are unwilling to abandon the cultivation of the potato as a subsidiary article of food.

As an exclusive diet, the evils attendant on that root arise out of the facilities which it affords for obtaining food with little labour; and the consequent absence of a stimulus to industry. The advantages of the potato, as a subsidiary diet, con-

sist in its giving to the meal, when mixed with more nutritious food, that bulk which is conducive to digestion, and in supplying those constituents of the animal frame in which that other food is deficient. Potatoes at the present time are dearer than bread, in proportion to the nutriment which they contain; and, for the cost of a bread-and-cheese, or dry bread diet, the English labourer might have a warm meal eaten at home, which should be alike palatable, wholesome, bulky, and nutritious, if his wife were skilled in cookery, and if the position of his home with respect to his work permitted it. In a period of scarcity like the present, when bread is dear, and potatoes even dearer, the great desideratum is to find a substitute for the latter which shall be both bulky and nutritious. Rice, maize, haricots, oatmeal—all require much cooking: they require to be cooked either with milk or with meat. The labourer of the south of England has not, in general, like the northern hind, the advantage of keeping a cow. In those counties where he does not enjoy that privilege, recourse must be had to the low-priced joints of the butchers: with these and the vegetable ingredients which we have mentioned, and with the onions, the carrots, the cabbages, the turnips, and pot-herbs which the cottage-garden should supply, many a savoury and nourishing meal might be made at a trifling cost. The poor, however, require instruction, not only in cooking them, but in eating them. They have yet to acquire a taste for such dishes. It is useless to give them cheap receipts, in which the meat bears an almost infinitesimal proportion to the other ingredients. There are small thanks, also, to be had in establishing a soup-kitchen for them. “Sure! it’s only wild hastes you are giving us!” said the Irish, in 1847, to a nobleman who boiled down his deer to make soup for them. “It is well enough for the money,” said a Kentish matron, of the soup she received from the village soup-kitchen; “but there is not enough meat in it!” In truth, we do not wonder at the prejudices of the poor against these benevolent establishments; for the culinary process has always appeared to us very similar to that employed in preparing food for the squire’s hounds, and the scientific farmer’s pigs—with this difference, that the most expensive food fell to the share of the hogs and the dogs.

The true way of teaching the peasantry to cook, and to eat cooked dishes, is to begin with the children; the place to teach it is the village-school; and the time to commence is when food is dear. This is the point to which we wish to draw the attention of our fair readers—and we know that they are many—who are overflowing with benevolence, which only requires to be directed into the right channel, and who are

anxious to find some employment more useful and exciting than crochet work. On the best method of teaching cooking in the village school we will offer them, with the greatest deference, a few practical suggestions.

In teaching the peasantry the importance of the art of cooking, we recommend that the active benevolence for which the ladies of England are so honourably distinguished should be directed to the imparting of this kind of instruction in the village school. We would suggest that in this season of scarcity, when, go where we may, we hear everywhere the same cry of wonder how labourers with ten and twelve shillings a week manage to live, there should be a committee of ladies formed in every parish, to feed at a cheap rate the children of the village, and that the school-girls should be taught to prepare the meal under the direction of the ladies. We see no reason why the boys also should not be initiated in the process; they will find it useful hereafter, either as colonists or soldiers. Let the bill of fare be not the same eternal mess of washey-looking soup which is usually doled out from the soup-shop, but let it be varied from day to day. Above all, let there be no mere "tasting of the soup;" but let some portion of the ladies' committee and their families sit down daily at the upper end of the table, and make a hearty dinner—or rather luncheon, which is in effect the fashionable ladies' dinner—with the poor. This will be teaching by example. The children of the village labourer will be taught to cook, and to acquire a relish for such cheap dishes as skilful cookery can provide: they will be taught a certain degree of refinement at their meals by eating in company with their superiors, for they will take as much pride in imitating them in their mode of feeding as in their dress. There will thus be something like a return to those customs of the olden time, which we admire so much in romances and practise so little in real life, when the greater portion of the village population were retainers of the squire, and dined with him in the great hall "below the salt."

But the expense? It would ruin any ladies' committee, it may be objected, to feed all the children of the village. We do not ask to have them fed gratuitously. We propose that a certain price per head should be paid by those, whether rich or poor, who partake of the meal; and that the difference between the expenditure and the receipts should be made up by subscriptions among the rich. The pecuniary sacrifice demanded will be but small. It will require only the giving up of a few expensive entertainments, and will be an approach to the gospel injunction of making a feast for the poor instead of the rich.

In the summer time the scene of the entertainment may be transferred from the school-room to the heath—where a heath can be found—to the river-side, or the woodland; and thus the poor will be initiated in the pleasures of a pic-nic or a gypsy party, which they see "the quality" take a delight in, which to them appears perfectly incomprehensible. "The gentlefolks," observed an old labourer, "likes to take their victuals into the fields, and eat them under a hedge; they would not be so fond of it, if they were obliged to do it every day and in all weathers."

We know not why a pic-nic should lose its charms for the upper classes because they occasionally admit their humbler neighbours to share those refined pleasures with them. Professor Henslow was the first, we believe, to carry into effect in his parish the plan of an annual excursion of the whole village, in which all ranks mixed, to which all contributed alike, and at which the fare was of the plainest and cheapest kind. The advantages which were found to result from this blending of the different strata of village society have caused the plan to be adopted, and with equal success, in several other places.

As a practical lesson in arithmetic, we would propose that the school-children should keep an account of the cost of the daily meal, and divide it by the numbers who partake of it. The lessons of thriftiness, and, though last not least, of refinement which they would learn from this intercourse with those above them, would be carried from the school to the cottage, and would exercise a most important influence on the condition of the parents. What, in nine cases out of ten, tempts the labourer from his home to the alehouse?—what but the absence of comfort at home? If you wish to keep him from the beer-shop, teach his wife and daughters to cook.

"When the swinked hedger at his supper sate," is Milton's sketch of evening as it fell on the peasant life of England in his days. And how beautiful is the picture Burns, himself a peasant, has painted from life, of the northern peasants' home, in his "Cotters' Saturday Night!" There was cooking at that meal—simple cookery, it is true—of the "halesome porritch, Scotland's chiefest food." But the Scots are a cooking people; and even that thrifty race have a variety of dishes in their bill of fare—the haggis, the sheep's head, the barley broth, and the griddle cakes—which an epicure might envy, and which are unknown to the English peasantry.

If the English labourer of the south does not now sit down to a warm supper at home, it is because he can scarcely be said to have a home, because he has no cow, and because his wife cannot cook. The clearing system has deprived him of a home;

he has rarely a cow, and, instead of a warm supper, he eats dry bread, after the fashion of some counties where wages are low, or bolts raw bacon with it, after the fashion of others where they are high. The amended law of settlement will restore that home of which the clearing system has deprived him, and by so depriving him has greatly contributed to drive him to the beer-shop. He who trudges, daily, miles enough to constitute of itself a day's work, between the farm on which he toils and the town or village where he "bides"—for one of this class well drew the distinction between biding and living—must not be judged too harshly if he seeks in beer, rather than in wholesome food, a stimulus to his flagging spirits and exhausted strength. The fault is with those who pulled down his cottage, and sent him within the reach of temptation. A union rating will correct this evil, and will cause dwellings for the labourer to arise on the farm at which he works, with gardens attached, with which to amuse his leisure hours. The farmer will in time find it his interest to adopt the northern system, which we have so frequently recommended, of keeping a cow for him. On

the ladies we would urge the task of teaching his children to cook and to relish cooked food; and we anticipate the most beneficial results from the presence of the ladies, both at the cooking of the meal for the village school, and at the board at which it is eaten.

Judge Haliburton lately spoke with admiration of the progress made in England during the last twenty years towards a freer intercourse between the different grades of English society. The contrast would be greater if we carried back the retrospect fifty years—to the commencement of the last war, of which the outbreak of a new war recalls the remembrance. How different the treatment of soldiers and sailors at the two periods! How different the treatment of their wives and children! There is yet, however, much room for improvement in the treatment of the rural labourer, and in the intercourse between our higher and lower classes in general. The instruction which we propose for the children of the poor, and the mode which we recommend for imparting it, would be an important step in the right direction. In the hands of the ladies we leave it.

HOW WILL WAR AFFECT THE AGRICULTURAL INTEREST?

After forty years of peace, we are once more entering on war. Will it be short, sharp, and decisive? or will it afflict the nations for another twenty years? Will England come out of it, as out of the last, covered with glory and with wounds, and with some four or five hundred millions added to her debt? Is she to triumph, or to fall? Will the Scythian hordes be driven back to their native snows? or will they over-run the fairest regions of Europe, and plunge them in darkness and barbarism, like that which overspread the civilized world when Imperial Rome sank before the swarms which issued from the same northern hive? Will Europe become Republican, or Cossack?

These are questions which we leave to political writers. Our concern, as agricultural journalists, is chiefly with the question how the war, should it be protracted, will affect the agricultural interest. We can remember a time—it was not many years after the battle of Waterloo—when the first attempt to maintain a "remunerating price" for corn, by means of protecting duties, had been tried and had failed, for prices were very low, and when the prevalent opinion at fairs and at market-tables, as well as at regimental messes, was that we wanted a "good war." Nothing else, it was supposed, could set the farmers on their legs again. Nor was the opinion confined to the capitalist farmers of

England: it was equally prevalent among the land-lacking agricultural labourers of Britain and the capital-lacking holders of land in Ireland. "Bad times these," said a cottier of the county of Cork, "when the king wants neither men nor pigs." "What is your opinion of Napoleon?" said an English traveller, who knew so little of the Irish peasantry as to think he could pump them as to their political feelings. "Sure, yer honour," was the reply; "he was the boy that knew how to sell the pigs." Perhaps there are some who expected Napoleon the Third to rival his uncle in this respect, and who, disappointed in that quarter, are now turning their eyes towards Nicholas of Russia. The majority of farmers, however, have grown wiser. "Glorious times these, for you farmers," it was observed, in our hearing, to an extensive occupier of land in Norfolk, now verging on his eightieth year, and who had therefore had some experience of the vicissitudes of farming, during the war of the French Revolution, and the peace which followed it; "glorious times these for you farmers, with wheat at 80s. the quarter during peace; with the export of corn prohibited from Odessa; with war about to commence; and gold, in the meantime, raining down on us from Australia and California."

"I call them bad times," was his reply; "I cannot

bear to see these high prices; they were the ruin of one generation of farmers, and I fear they will be the ruin of another. This I know, that if the funds were at par; that is what we used to call par in the war-time—Consols at 60, so that you could make 5 per cent. of your money; not what they call par now, Consols at 100—I would sell off and invest in the funds.”

Though the many “*Ifs*” of the late protracted negotiations have failed to produce peace, your *Ifs* nevertheless as great a peacemaker as ever, and therefore we are confident that our worthy old friend will not sell off, but that he will continue to farm, and will bear up under war prices as well as he can. We are fortified in this opinion by the recollection that, not many months since, we heard him equally lugubrious over low prices.

The question, however, how a long war and war prices will affect the farmer, and how he may best protect himself against the revulsion which must inevitably follow, is well worthy the serious attention of every one who earns his bread as an occupying tenant.

The present war finds us with a population, double what it was forty years ago, with greater powers of consumption, and more dependent than ever on foreign supplies of food. The improvements in agriculture have been immense during the last ten or twelve years, and they are still progressive to such an extent, that they may virtually double the area of these islands, and thus stand in the place of the new lands which were brought into cultivation during the last war, and of which we have exhausted the supply. Our importations of foreign grain, during seven years of free trade, have considerably increased, though they have disappointed the hopes of some and the fears of others; and still it is found in practice, that from our own soil and from abroad we receive no more than we can consume. The chief increase has been from the Black Sea and from France. The supply from the countries bordering the Black Sea must cease, while they are the seat of war; and that from France was a temporary exception to a general rule. She had previously been an importing country. The large exports which took place after the revolution of 1848 arose more from distress occasioned by that revolution, and accompanied perhaps by hard cropping and a cycle of pro-

ductive crops, than from a superabundant produce caused by an improved system of cultivation. France is again an importing country, and a competitor with us in every market where corn is to be bought.

Our supplies from the Baltic have not materially increased since our ports have been thrown open to the Polish wheat-growers who ship from the coasts of that sea. Neither have Canada and the United States overwhelmed us with their breadstuffs, as many expected. It is to that quarter we must look for supplies while the Baltic and the Black Sea are the seats of war. We trust that, between the British provinces and the United States, America may be able to furnish that grain which we want and which we cannot or do not raise at home. We must remember, however, that every year the wheat-producing districts of America are receding further from the coast, under the exhausting system of cultivation prevalent in those new countries; and that States and Provinces which were once celebrated as large growers and exporters of wheat, have become dependent for a portion of their own food on the growth of other districts. The rate of wages, always high in America, is advancing, and thus increasing the cost of production; there are, moreover, indications not to be mistaken, that a certain range of price here, considerably above that which English farmers have of late been accustomed to consider remunerative, is necessary to draw much wheat from America. War will enhance the cost of transport from all countries; and if the war shall be protracted, we shall have, in all human probability, a long series of high-priced years, followed by low prices on the return of peace. We shall thus go back again into the old circle: we shall have landlords repugnant to bind themselves to leases at money rents; we shall have tenant farmers bidding against one another for land; and seeing how they have been doing this, during a period of low prices, so as to prevent a reduction of rents during those low prices, we may not unreasonably expect, as one of the results of a long war, that rents will advance as extravagantly as during the last. How should a prudent farmer act under such a state of things? We will endeavour to answer this very important question; but we must postpone the consideration of it to another opportunity.

EPIDEMICS, TOWN DRAINAGE, AND MANURING THE LAND.

SIR,—Your lucid article of the 13th, on the subject of the disease in turnips, and Professor Simond's report on a malady that has proved so fatal to many bullocks the property of his Grace the Duke of Richmond, in

which that gentleman observes he has satisfied himself “that the affection, although centred in the lungs, was not of the *precise nature* of the one commonly known as pleuro-pneumonia,” necessarily suggest whether any

change is taking place in the atmosphere or the earth, or in both, sufficient to cause these perplexing evils, it being evident that they must be referrible to some cause. I am, therefore, induced to trouble you with a brief detail of certain principles that have within these few years presented themselves to my mind, which I think calculated to throw some light on the subject, as well as on town drainage and manuring the land—of no less importance to the agriculturist.

There are few individuals, who have received the most ordinary education, to whom the terms "attraction of cohesion" and "attraction of gravitation" are not perfectly familiar, yet it would have perplexed a Newton or a Davy to have conveyed an idea of their meaning, beyond that the first was intended to express a something that caused matter to stick together, and in the latter that *attracted* bodies to the earth. We are, however, cognizant of the fact that, if two bodies be similarly electrified, they repel each other, and attract each other if dissimilarly electrified; and if the two halves of a thin sheet of note-paper be warmed and rubbed with india-rubber, one half-sheet being under the other, they will acquire adhesiveness, and, on their rapid separation in the dark, a flash of light will be visible, or the electricity which held them together will be set free, and become apparent; but if the same pieces of paper be rubbed separately, after being warmed, they will repel each other. A flash of light will also be apparent on the separation of the sheets of hot-pressed paper, and in snapping a lozenge; and if pieces of well-dried loaf-sugar be put into a dry, clear bottle, and shaken in the dark, sufficient light will be evolved by the disintegration of the particles to illumine the room. Electricity, then, is the bond in matter, or the attraction of cohesion.

Mr. Andrew Crosse, about thirty years since, demonstrated, with his exploring wires, that the upper or surrounding regions are highly electric; whilst the late Mr. William Henry Weekes, about ten years afterwards, as clearly proved, with his electric kites, that the atmosphere increases in electrical condition with distance from the earth; and it need scarcely be remarked that cold also increases with altitude, and therefore with electrical condition. But we have hitherto been taught to consider "heat" the positive, and "cold" the negative; and we say that bodies become cold by parting with their heat. Reasoning, however, on natural phenomena, more especially in reference to crystallization, brought me to an immediately opposite conclusion; and I, therefore, naturally drew the inference that what is called freezing, was nothing more than the crystallization of water; and, if so, the decrystallization of ice, which, like that of salts, produces an intense cold, should be accompanied by the evolution of free electricity, to prove which I had recourse to an experiment no less novel than those I have detailed to demonstrate "attraction of cohesion." Into an oven I put a jug containing a hot solution of alum, and likewise two tumblers, that the whole might become of the same temperature. The tumblers I nearly filled with the solution, and insulated them over the oven, in an

atmosphere of 80 degrees. At the other end of the room I insulated a freezing mixture of ice and salt, in the centre of which was a copper coil, which, by a fine copper wire, I connected with one of the tumblers. In the space of a short time, beautiful crystals formed on the top of the solution, and fell to the bottom of the glass, although the solution in the other continued perfectly clear; and when the unconnected solution began to crystallize at the bottom of the glass, I put two cold tumblers on the table, into which I turned the two solutions. That connected immediately coated the whole of the interior of the glass with alum, in an arborescent form; whilst the other formed the ordinary crystals at the bottom of the tumbler.

Reasoning, then, on these principles, that bodies repel each other in proportion to the intensity of their similar electrical condition, that electricity is the bond in matter, and that bodies must become electric in proportion to their density, and that "weight," therefore, could be nothing more than the indication of the force by which a body was *repelled from or attracted to the upper regions*, I was naturally brought to the conclusion that matter, by contraction and compression, must increase in weight as well as in specific gravity.

This momentous law I verified perfectly to my own satisfaction, and communicated it to the Board of Health in 1848, in a paper which I addressed to that board, "On the Electrical Condition of the Human Frame, in Reference to Epidemic and other Diseases;" but, fearing the evidence I adduced was not sufficient, I endeavoured, but in vain, to obtain the testimony of some scientific authority, such as that of Messrs. Ransomes and May, the agricultural implement makers, and compressors of pine for railway chairs; and from that time to the present that law has continued a dead letter in the scientific world. But time, that leveller of rugged paths, has brought facts to light which remove all doubt in the matter, as will be seen by the following extract from the *Times* of Dec. 13, 1853, p. 6:

"DAMAGE TO VESSELS' CARGOES.—The suljoined letter from the Agents for Lloyd's, at Shanghai, on the subject of damage to vessels' cargoes arriving out at that port from England has been posted in the Underwriters' Rooms. The principal cause of the evil is to be found in the *great increase of weight* in the goods by the *severe hydraulic pressure* upon them when being packed with a view to *compress* them in as small a compass as possible to save freight."

Such testimony as the above can require no corroborative evidence; and if the *Times* has commented on the fact as if it were one of the most ordinary occurrences, and perfectly understood, it may be observed, in extenuation of this apparent departure from its *usual* line of *candour* and *propriety*, that it is not a scientific journal, and therefore not bound to notice such matters, but cater for the public as best it can.

FRANKLIN COXWORTHY,

Author of "Electrical Condition."

Maresfield, Sussex, Feb. 16.

GUANO QUESTION.—GROSS MONOPOLY.

The subjoined letter, which we extract from *The Times*, from a shipbroker, on the guano question, suggests that one cause of that difficulty of procuring tonnage which acts as an additional check to an adequate supply being received in this country consists in the fact of shipbrokers being deterred from offering vessels to the London agents of the Peruvian government owing to their requiring, beyond the profits of the monopoly, one-half of the commission which the owner of the ship pays to the broker for his services:—

"Sir,—*The Times* of Thursday inserted a letter from Mr. Caird on the deficient importation of guano. I do not propose to deal with the entire question, after what has already been said about the monopoly of this trade and other abuses; but there appears to me to be one important point not yet touched upon.

"Mr. Caird asks how it is that ships are obtained for America, where an abundant supply is imported, and that England has far less than a sufficiency. It may not be generally known that the British agents of the Peruvian government, to carry out more completely the principle of enriching themselves, insist upon a full moiety of the brokers' commission, and demand, before signing any charter, that the broker shall endorse upon every charter-party for a ship an obligation to pay to them half his brokerage for the privilege of giving them a ship.

"Now, I would ask any reasonable man whether this is an inducement to place ships at their service, or whether it is not the broker's interest to avoid them so long as he can place the ships at his disposal with merchants who claim no rights over the broker's legitimate and established brokerage?

"It would be an untruth for any broker to say that he would rather pay a penalty—for it amounts to that—to these

agents than take his ships to those who make no such unjust demand.

"It must be borne in mind that the brokerage for procuring a freight is paid by the shipowner entirely. The merchant or hirer of the vessel pays nothing; how, then, can he thus claim, with any fairness, a commission of the broker who performs the service of bringing him a ship? Are we made active by being arbitrarily forced to endorse upon a charter-party an obligation to pay a penalty for the aid we render him?

"To illustrate the effects of this principle still more strongly, it may be mentioned that if a ship be placed in the hands of a London broker by a foreign broker, or a broker in one of the outports, it is consistent and customary that these two brokers should divide their commission together; but, in such cases, the brokers must content themselves with one-fourth of their brokerage each, as these agents selfishly refuse to abate one tithe of their penalty of half-brokerage under any circumstances. They must be paid. The brokers may starve, or take their ships elsewhere.

"It seems to me likely that the above may be one trammel on the importation of guano, and it rests alone with these agents to remove it. I, for instance, never take a ship to them unless their rate of freight requires me conscientiously to do so, and I leave it to others to determine whether I am singular in so doing.

"Furthermore, they have a charter-party of their own, which is full of one-sided conditions, and owners are not easily induced to sign it. This acts as a further impediment.

"I am, sir, your obedient servant,

"A SHIPBROKER."

EXTREMES IN FARMING.

Sir,—For many years I have, in the summer season, been in the habit of taking a tour through Buckinghamshire, Northamptonshire, Rutland, and Lincolnshire, and have observed in forty years great changes in farming have taken place upon the same land. Farms that were in very high condition are now, by a fresh tenant, in very low and bad condition; and farms that were in very low and bad condition, by a fresh tenant, are now in very high and good condition.

The two following extremes of farming I will mention as a caution to incompetent stewards of noblemen. By the side of old Rockingham Forest, a tenant has taken a farm of about 500 acres, in very high condition. His predecessor converted a great deal of corn and oilcake into meat—beef, mutton, &c.; he had fat oxen and sheep to sell all the winter season and spring. His follower converted neither cake nor corn into meat, with the exception of feeding a little pork and bacon for his house; he did not employ half labour sufficient for his farm; he farmed the land until it was a bed of twitch or couch; he grew more weeds than corn; he neglected his hedges and ditches; and the underdrains which his predecessor had made were stopped up for the want of an outfall. I need not add that this negligent tenant reduced the value of the farm, to rent, 10s. per acre in twenty years. Another farmer—a diligent, persevering man—took a farm about the same time, in the same lordship, under the same noble lord, in very

low and bad condition. He forthwith went upon the fatuous and far-famed Norfolk system, converted a great deal of corn and cake into meat, preserved every particle of manure. He grew great crops of corn, and no weeds; and improved his farm, in twenty years, to rent, 10s. per acre.

A strawyard farmer will soon take the mettle out of a highly-cultivated farm. When I say "a strawyard farmer," I mean a man who eats with cattle the principal part of his straw, without cake or corn. If cattle eat straw alone, they dung straw; and the manure is straw, the cattle are straw, the farm is straw, and the farmer is straw, and they are all straw together. Making cattle very lean with straw, lessens their lean flesh.

The next is a young farmer of the first magnitude, in North Lincolnshire, who has taken the *Farmer's Magazine* for five years, from which, he says, he has borrowed great information, both useful and very profitable—so much so, that he produces as much more corn, upon the same number of acres, as his predecessor grew twelve years back. He pays great attention to his root-crops; and the *Farmer's Magazine* has taught him that the root-crops are the mainstay of all good farming, and that the more meat a ploughed farmer sends to Smithfield, the more corn he will be able to sell per acre at Mark-lane.

S. A.

86, Vauxhall-street, Vauxhall, Surrey.

AGRICULTURAL BIOGRAPHY.

(Continued from page 493, vol. xxxix.)

CCCLXXIII.—JOHNSON, 1814.

John Johnson wrote "Short essay on agricultural improvements, showing as the first object the great need thereof:" 1814, 8vo., price 4s. 6d. This work is not found in the National Library, nor is the name mentioned in Loudon's list of authors; the above statement appears in the *Bibliotheca Britannica*, which forms the sole authority for the use of the title in this place. A regret is always moved when a book escapes notice, as our liking is to examine every idea that has occurred to any person on agricultural subjects. If there is much to be refused, there may be some small thing gathered, and this may reward the labour incurred.

CCCLXXIV.—SIMPSON, 1815.

Pindar Simpson wrote "Treatise on the cultivation of mangel wurzel as winter food for cattle." "On the improved beet-root, as winter food for cattle;" London, 1815, 8vo. This work is not found in the National Library; the above statement comes from Loudon's list of authors, and the *Bibliotheca Britannica*, which are the authorities for our entering the name of the writer and of the work. At the date of the book, the subject was interesting and invited attention, as a plant was working its way into use, which has proved a very valuable addition to the vegetables of the farm.

CCCLXXV.—MAVOR, 1814.

William Fordyce Mavor, LL.D., vicar of Hurley, in Berkshire, wrote "Agricultural survey of Berkshire, drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 8vo., 1808. The work is an octavo volume of 548 pages in 18 chapters, and an appendix of 6 divisions or numbers. The plates are numerous; the map of the county is finely coloured in the geological districts, but the portraits of swine, sheep, and cattle are very faulty. The practical subjects are well discussed, and the observations are very judicious. The author treats paring and burning as it should be, imputing to ignorance and misapprehension the supposed injuries of that mode of fertilizing land. The appendix contains several useful notices. The whole work is highly creditable, scientific, and practical, as might have been expected from the author of the *British Nepos*, and other superior works. His scientific learning has probably carried him beyond the public reception, but on most points the work is not exceeded by any book of the kind.

CCCLXXVI.—HORNBY, 1815.

Thomas Hornby, Esq., surgeon, York, wrote "Dissertation on lime, and its use and abuse in agriculture; embracing a view of the chemical effects;" 1815, 8vo., price 2s. This work is not found in the National Library; Loudon's list of authors and the *Bibliotheca Britannica* are the authorities for the name and title in this place. The author's ideas on this very much speculated point would have been very agreeable, but probably have added nothing beyond the commonly entertained opinions. The use of lime may arise from the capability of the soil to which it is applied to receive and retain caloric; and the abuse or non-effect may proceed from the soil radiating the caloric too quickly, and retaining none for use. The former case will understand the best loams; and the latter comprehends sands, and the lighter soils of every denomination.

CCCLXXVII.—BIRKBECK, 1815.

Morris Birkbeck wrote "Notes of a journey through France in 1814, describing the habits of the people, and the agriculture of the country;" 1815, 8vo., price 4s. "Letters from the Illinois;" 1818, 8vo. "Notes in a journey over America, from the coast of Virginia to the territory of Illinois;" London, 1818, 8vo. Loudon states that the author was a farmer in Suffolk, and afterwards an extensive proprietor and cultivator in the Illinois, and was drowned there in 1825. He has certainly made an excellent volume on the condition and prospects of that country, and which in our opinion claims the superiority over any other that has been issued. A book of 221 octavo pages, in 22 chapters, affords a mass of curious and most valuable information, and conveyed in a very truthful colouring and simple manner of writing. A map of the far west country is very useful to show the routes of travelling, and the position of the settlements.

The travels over France are very amusing and instructive, and are simply expressed. The above works hardly entitle the author to a place among British authors on agriculture; we follow the example of Loudon, and other catalogues of books and names.

CCCLXXVIII.—RICHARDSON, 1815.

William Richardson, D.D., late fellow of Trinity College, Dublin, wrote "Essay on the utility and cultivation of fiorin grass;" London, 1810, 8vo.,

price 2s. "Letter to the Marquis of Hertford, on the culture and use of fiorin grass;" 1810, 8vo. "A new essay on the fiorin grass;" 1813, 8vo. "Memoir of useful grasses; on fiorin grass;" Nicholson's Journal and Philosophical Magazine, 1809 and 1813. "Essay on agriculture-as a science, divided into separate departments;" *ibid.*, 1816.

This author was a very learned person, and wrote on geological subjects, especially on the basalt as being an ancient lava. His works were of an ephemeral nature, hastily and carelessly concocted, and negligently regarded. An active observation had remarked the ready and quick luxuriance of the creeping bent grass on the humid soils and under the dripping climate of Ireland; the use was adopted, and it succeeded. A sanguine temperament recommended its adoption under all circumstances, and combated with a heated animosity the legitimate and valid objections that arise from the soil and climate of different situations. The author's success in his own peculiar situation never was questioned; but the extending of it became a widely different operation. The Bent genus of grasses, *Agrostis* of botany, produce a very small bulk of herbage; the seeds are very minute and small in quantity, and the propagation of the plant is almost wholly by means of the creeping roots, which throw out a stem from each joint.

These qualities, joined with the inferior nutritious properties of the grass, serve as an effectual bar to any large use of the plant, and must have appeared to any dispassionate judgment of the subject. The sowing of the grass was done by planting the stolons; a slow process and an expensive one, and entitled to much consideration in viewing the matter. It was only useful in laying artificial meadows to produce dry hay for winter food, and hence the inferior object in comparison with a root crop for a juicy nutriment.

A very great recommendation of the ray-grass plant is the quantity of sound seed that is produced, the ease with which it gathered, and the facility of committing the seed for a crop in the prepared ground. In the same points, the turnip exceeds the other green plants, as the potato, cabbage, carrot, and parsnip. The author had possessed little practical knowledge, and much less cool consideration.

CCCLXXIX.—CLINE, 1815.

Henry Cline, Esq., surgeon, wrote, "Essay on the form and breeding of domestic animals;" 8vo., stitched, price 1s. The contents are in 14 pages, and describe very correctly the forms and bulks of the different parts of the animal organization, deduced from experience and anatomical principles. The author's ideas have ever been held to be very

correct, and if he had enlarged upon the subject, his time would have been well spent, and the labour of reading would be profitably employed.

CCCLXXX.—LEE, 1815.

H. P. Lee, Esq., of Maidenhead Thicket, Berkshire, wrote "Description of a new threshing machine, invented by him;" Nicholson's Journal, xxix., 274, 1811. The author was largely concerned in agriculture, holding nearly 800 acres of arable land, and was compelled to attend to the means of manufacturing cheaply the large quantity of grain which was produced by cultivation. His alteration of the common threshing machine amounted to a nominal fraction, being a slight change in the delivery of the straw, grain, and chaff, after being separated by the beaters. The alteration never got into public notice or adoption.

CCCLXXXI.—ANDERSON, 1816.

William Anderson, farmer, Angus-shire, North Britain, wrote "Observations on a new mode of stacking corn, peculiarly adapted to wet seasons; recommending a plan successfully practised, by which corn may be stacked with advantage, soon after being cut down;" 1816, price 1s. 6d. This book is not found in the National Library; the above statement appears in the Bibliotheca Britannica, and in Loudon's list of authors. The author's ideas would be curious to know on a point which, if at all practicable, might probably incur an expense that would set it aside for general use. In accordance with the above plan of ricking newly cut grain, our idea has often imagined some way of making hay, *minus* the great toil and labour of the present way.

CCCLXXXII.—HAYNES, 1817.

Thomas Haynes wrote "Essay on soils and composts;" 12mo., price 5s. The author was a noted horticulturist, and wrote on the strawberry and general notices; the above-mentioned essay is not found in the National Library.

CCCLXXXIII.—MACWILLIAM, 1818.

Robert Macwilliam, Esq., architect and surveyor, London, wrote "An essay on the origin and operation of the dry rot; to which are annexed Suggestions for the cultivation of forest trees, and an abstract of the forest laws;" 1818, 4to., price 21s. The National Library does not contain this work, which is barely agricultural, though the dry rot in roofing timbers will sometimes occur to the farmer's notice. The Bibliotheca Britannica makes the above statement, as also Loudon's list of authors, and on the latter very respectable authority our biography uses the name and title. Not many authors had escaped the notice of his research, which was used equally on small matters as on momentous consequences.

CCCLXXXIV.—WILLIAMS, 1819.

T. W. Williams, wrote "The farmer's lawyer; containing the whole of the law and local customs in regard to agricultural possessions, properties, and pursuits;" 8vo. This work is not found in the National Library, and the Bibliotheca Britannica quotes T. Williams as the author of "Every man his own lawyer," and several compilations, which may have come from the same author as the above statement from Loudon's list of writers. Law and the dry rot will be in the farmer's way, and though not strictly practical, the alliance is sufficiently near to claim a notice in the chronology of the art. And a precedent has been given for the insertion of both names.

CCCLXXXV.—TOWNE, 1819.

—Towne wrote "Farmer and grazier's guide," in a small octavo, price 10s. The only notice of this work is the advertisement of it in the London Catalogue of books; no list of publications or authors notices the name.

CCCLXXXVI.—RADCLIFFE, 1819.

Rev. T. Radcliffe wrote "A survey of the husbandry of Eastern and Western Flanders, made under the authority of the Dublin Farming Society;" 8vo. Loudon's list of authors makes the above statement, but the book does not appear in the National Library. But the author performed well the task he undertook, and the work has been correspondingly esteemed. The continent of Europe had been locked from British intercourse for many years; when the general peace opened the gates of access, a rush was made to catch the treasures of any kind which were supposed to have been concealed from use during this long cessation of intercourse. But nothing resulted to agriculture; liquid manure was the chief topic, which requires both soil and climate to be of a peculiar construction to favour its development. In Britain, it was volatilized by enthusiasm, vanished into vapour, and has now been condensed into cold water, to be used as before, in being absorbed by straws and earths.

CCCLXXXVII.—SWINBOURNE, 1819.

R. Swinbourne wrote "The farmer's new and complete account book." This folio book contains 129 pages, divided into the necessary forms of detail. The first page contains the inventory and valuation of stock, and then the weekly accounts of wages for a year. The columns are given for the sale of all grains and roots; purchases and sales of every kind; summary of receipts and payments; and accounts of grain dressed, used, and sold. An abstract is added of the whole business of the year. This work seems to be among the first, if not the

first, that was issued for the farmer, and is not the worst among the many that have followed.

CCCLXXXVIII.—BURROUGHES, 1820.

Edward Burroughes, Esq., wrote "Essays on practical husbandry, and rural economy;" 8vo. The National Library does not contain these publications; but they are well known to the public, and are mentioned by Loudon. The author was an Irish gentleman in society, served in the army, and was latterly a farmer in the county of Worcester. His attention was much turned upon green crops, which he raised and used very systematically and successfully. The author was not carried away by any reverie, or visionary schemes; substantial utility was close behind every practice, and sanctioned every operation. He was active and intelligent, judicious, and steady to his purpose. He died, we think, about 1830.

CCCLXXXIX.—BEATSON, 1820.

Major-General Alexander Beatson wrote "A new system of cultivation without lime or dung on summer fallows, as practised at Knowle Farm in the county of Sussex;" London, 1820, plates; supplement, 1821, 8vo., plates. The author was aid-de-camp to the Marquis of Wellesley in India, during the war with Tippoo Sultan, and wrote a work on the origin and progress of the war. He served in the army to the general peace; retired to a farm near Tunbridge Wells, where he compiled the above work; was called to the governorship of St. Helena, where he died after writing a work on the introduction into the island of a better agriculture, and other improvements.

General Beatson possessed a very active and acute perception, and had the faculty of methodizing into a system for practice the observations that were presented. It is a rare faculty, and distinguishes originality from the herd of slavish followers. In India, the observations were converted into a handsome volume. In the island of St. Helena his visual organ perceived the want of a better agriculture, and two tracts were written on the subject; and at Tunbridge Wells, and among the Wealden clays of Sussex, he observed the labour of the farmers during winter, in ploughing up stiff soils which employed them throughout the summer in the reduction to tith. He conceived the idea of not ploughing the lands at all, but to scarify the surface in the depth of two or three inches, which would supply the necessary pulverization to the seeds and roots of plants, and by scorching and torrifying it to supply the place of manures with the scorched soil. His book details the system, and its success on Knowle Farm; but his removal and death killed the operations, and the system went to the grave

with its author. The idea still survives, but hous-
less and homeless, neglected and forgotten.

The operations of the life are on the surface of the earth; and after the ground has been prepared in the common way, and the seeds of plants committed to its bosom, the growth of vegetation is the joint operation of terrestrial and atmospheric action. It is possible that the former may be produced by some easier process than the usual mode of practice. A vast fertility is seen to follow very slight operations on the surface of the ground; a scratch being done on the top of the earth, produces great effects, by reason of the superior quality of the materials among which the movement is made. The extreme upper surface of the earth is humified by the formation of that body from decomposed animal and vegetable matters in some degree of quantity and quality; it is aerated by the exposed propinquity to the atmosphere, and therefore it is much the best prepared receptacle for the seeds of plants. The labour and expense of turning up and preparing the under-soil may not be compensated by the addition that is made to the upper stratum by the intermixture of pulverized cold earth which is got by reduction of the soil.

There is a vast fertility produced by the covering of the ground, or the protection of it from the wasting influence of the sun and winds. This application may very much help the idea of General Beatson, by preventing the waste from exposure of the small quantity of upper soil that is pulverized by his mode of scarifying the surface. It had not occurred to him; but the junction of the two suggestions might prove a fact when one proposal might fail. Our own opinion has ever regarded General Beatson's initiating practice as the germ of a revolution in the management of clay soils; he made a large deviation from established practice, and a smaller step than he took may at no very distant time finish the beginning which he commenced.

CCCXC.—RIGBY, 1820.

Edward Rigby, M.D., F.L.S., surgeon at Norwich, wrote "Holkham, its agriculture, &c.;" 8vo., 1821. "Framlingham, its agriculture, &c., including the economy of a small farm;" 8vo. The author wrote on several professional subjects, and the books were considerably reputed. The two essays above-mentioned are very plain and truthful descriptions of the agriculture of Holkham, as done in its palmiest days by the well-known T. W. Coke, Esq., who was latterly Earl of Leicester.

The author wrote "Suggestions for an improved and extended cultivation of mangel wurzel." The writer expresses the matter very sensibly on all farming subjects, combats prejudices very successfully, and states the results most candidly and with

becoming satisfaction. He might be prejudiced from the outset in favour of Holkham farming, and may have looked at everything in a very favourable light; but the facts which are stated, and the results that are enumerated, are altogether undeniable, and never could have been doubted, except by purblind jealousy and the meanest prejudice. Mr. Coke was an architect of the very first order; he aimed at great heights, and at the same time built firmly; he laid a solid foundation, and used good cement in knitting the superstructure; he showed a great mind in labouring for posterity, and he made in himself his own monument.

CCCXCI.—MATHER, 1820.

John Mather, Castle Hill, Carse of Gowrie, Perthshire, N.B., wrote "The Farmer and Land Steward's Assistant, or a specimen of farm book-keeping, exhibiting, in a concise and simple form, the transactions in the arable, grazing, and woodland departments, a general cash account, and an account of the charge and discharge on each department, the whole selected from books of real business;" 4to.

This statement is taken from Loudon's list of authors; but the name is not found in the Bibliotheca Britannica, nor in the National Library. Publications on farming accounts now began to be issued, and were multiplied very fast; this author and Swinbourne were the first of any note, and are quoted accordingly.

CCCXCII.—GRISENTHWAITE, 1820.

William Grisenthwaite, apothecary, of Wells, in Norfolk, wrote "A new theory of agriculture, in which the nature of soils, crops, and manures is explained, many prevailing prejudices are exploded, and the application of bones, gypsum, lime, chalk, &c., determined on scientific principles;" 12mo. This name and work are not anywhere found except in Loudon's list of authors, and the writer does not seem to be known by publications of any other kind.

The pity is that any notice of agriculture should be concealed; for though little or no substantial good may accrue from such essays as the above work, yet it is pleasant to read the nibblings of any imagination at objects that are beyond its reach, and probably too big for its capacity. Such attempts have sometimes caught the subject in the true light, and hence amply repaid all former exertions.

CCCXCIII.—SPEECHLEY, 1820.

William Speechley, author of a Treatise on the culture of the vine, &c., wrote "Practical hints on domestic rural economy, with an appendix, containing several original agricultural essays;" 8vo.,

London, 1820. This work is not noticed in the *Bibliotheca Britannica*, nor in Loudon's list of authors; it is found in the National Library in a thin octavo volume of 190 pages, and dated from Great Milton, Oxfordshire. The only notice of agriculture is in an essay on spring wheat and top-dressings. The observations of the author are very sensible on the gardens of cottagers, extent, mode of cropping, and proper plants.

The agricultural value of the book is small, but still worth its room in a list of authors. The size of the cottage garden may vary from one-eighth to one-fourth of an acre, according to the value of the land, and the extent of the farm, and the number of the family. The farmer, who arranges his labouring department in the mode of gardens being attached to each dwelling, will do well to consult this book, where very judicious directions are given on every point that is contained in the arrangement.

CCCXCIV.—A PRACTICAL AGRICULTURIST, 1820.

This name wrote from Hertfordshire, and dedicated to John Christian Curwen, Esq., M.P., of Workington Hall, Cumberland, an octavo book of 176 pages, entitled "A treatise on soils and manures, as founded on actual experience, and as combined with the leading principles of agriculture, in which the theory and doctrines of Sir Humphrey Davy and other agricultural chemists are rendered familiar to the experienced farmer;" 8vo., London, 1820.

The author of this book reasons at length on many points, on which his science can never make any impression, as they are settled by an infallible experience. He arrives at conclusions, which were known before he began to write, and to which he has not added any valuable appendage. But he argues very acutely, and must have well understood the subject matter both practically and scientifically, and he avoids the common blunder of such persons in leaving the solid practice in exchange for unconnected and inefficient chemical terms. The book is worth perusal for its sound sense, if not enlightenment on any point which is mentioned. It was noticed in its day, but soon sunk into oblivion.

CCCXCV.—KAVANAGH, 1821.

—Kavanagh wrote "Cottager's Friend and Farmer's Guide;" 12mo., price 3s. 6d. The advertisement of this work in the London catalogue of books is the only notice of the publication: no other list contains the name.

CCCXCVI.—FINLAYSON, 1822.

John Finlayson, patentee of the self-cleaning ploughs and harrows, and author of a Treatise on

agricultural subjects, was born at Garfield, in the parish of Mauchline, and county of Ayr, in the year 1780. About 1788, his father James Finlayson removed from Garfield to the farm of Kaims, in the parish of Muirkirk, where he carried on extensive improvements, and was upwards of thirty years an elder in the established church. John, his second son, was only remarkable in early life for possession of a more than ordinary degree of bodily strength for his years; and at school he very much distinguished himself by his rapid progress in the knowledge of arithmetic and mathematics. When he arrived at maturity he was six feet two inches high, of fair complexion, and exceedingly handsome. To mount a horse by putting his foot in the stirrup he considered quite ungentlemanly in the eyes of a lady; he was therefore in the habit of taking hold of the mane, and lightly bounding from the plain. Throughout Scotland, the pastimes of hop, step, and leap, putting the stone, and throwing the hammer, are much practised. In these athletic exercises the subject of this memoir found no match for twenty years, and he relates being fitted to leap at the age of thirty-seven. "From Glentuck down to the Rutton-Key," Finlayson was as well-known for being the best man in the county of Ayr, as Burns was for the best poet. This quality in early life led him into many broils. At last the county had a certain pride in him; and whenever a regiment of soldiers arrived in Ayr, or a Hercules sprung up at Mauchline Fair, Finlayson was always sought after. He was sanguine in all his expectations, and possessed a remarkable buoyancy of spirits. He always undertook more than he could well perform, and consequently was not the best paymaster in the world; but he rarely forfeited the good opinion of even those who lost money by him.

"When cold in the grave, lies the friend that you loved,
Be his faults and his follies forgot by thee then."

MOORE.

In the latter part of his life, Mr. Finlayson, like every scientific man, might be said to keep an account with the public, rather than with individuals; as the generality gained by his spirited exertions. He never looked up for himself, nor could keep two pairs of boots beside him. Often has he given the last shilling to a needy supplicant.

He had the management of two farms, one at the hip of Cairntable, and the other near Old Ayr; and his going betwixt the two afforded him an opportunity of becoming extensively acquainted in the county. The improvements which he effected in the chief implements of agriculture were all the result of necessity. In the year 1820, he had embarked in the reclaiming of about thirty acres of rough heath land, and found himself greatly puzzled

to plough it the second season, from the continual choking of the plough by the tough furrow slices of the former year. On this occasion, he invented the circular beam, and made his edges more acute, which he kept sharp by the use of a file. Like a carving knife with a good edge, his new plough overcame every obstacle with the greatest ease, to his own entire satisfaction and the astonishment of his neighbours. The iron harrow and Kentish plough were invented by him in England, and were also the offspring of due necessity.

The first edition of Mr. Finlayson's book, comprehending a series of essays on the cultivation of moss, putrescent manures, furrow-trenching, the patent self-cleaning plough, and the art of ploughing, was published by Lang at Glasgow, in 1822; and the second edition by Mr. Ridgway in 1829. The reception by the public may be inferred from the opinions of the Press.

The British Farmer's Chronicle, of February 26th, 1825, says: "The author of this very useful and interesting work deserves the thanks of the country, and of the farming interest in particular, for the many great improvements in the science of agriculture, which he has here laid before them, the fruits of many years' study and practical experience. The general utility of his system, and the superiority of his new implements over every other, have been most satisfactorily proved in the successful public competitions held with them before experienced agriculturists, in the different counties of England and Scotland, many of which are noticed in the work now before us, and also in the Farmer's Magazine."

And the British Farmer's Magazine, for May, 1827, has the following notice—

"We think it would be difficult to select passages from any author of equal length, of more value to the practical farmer than these sections on lime and putrescent manures; in our opinion, had Mr. Finlayson never written anything else, he is well entitled to our attention and the public gratitude, as they furnish clear data for the farmer to go by, in applying his manures. With him everything is done on principle; we never find him recommending lime when there is already a superabundance in the soil; nor using putrescent manures to a field abounding with vegetable products: but like a philosopher, lime is administered to hasten the putrefaction of vegetable matter, and putrescent manures to convey direct nourishment to the exhausted soil."

The reports of the exhibitions of his agricultural implements in the different counties of England and Scotland, occupy a place of no less than thirty-three pages in the appendix to the second edition of his work. At one of these exhibitions, Mr. Fin-

layson caught a cold, which brought on pulmonary consumption, of which he died, unmarried, at Springhill, near Muirkirk, on the 11th of February 1826, in the 47th year of his age, deeply regretted by his numerous friends and the agricultural world.

An obelisk has been raised to his memory in the church-yard of Muirkirk; but the utility of his improvements will be the most endearing memorial.

The iron harrow, known by the name of "Finlayson's harrow," is a most valuable scarifier, and is not exceeded in utility by any tool of that kind in the present day list of agricultural implements. It has furnished the ground-work of several similar constructions, but has never been surpassed in merit.

CCCXCVII.—CLEGHORN, 1822.

James Cleghorn, Esq., formerly a practical farmer, and latterly an accountant in Edinburgh, was editor of the Farmers' Magazine in Scotland, and author of the article "Agriculture" in the Encyclopædia Britannica, and of other writings in that work. The author was one of the best modern writers on agriculture, being sensible and judicious, of sound views, and temperately enlightened. The agriculture in the above mentioned compilation has always been very much esteemed. The initiation shows much discernment; and the subsequent arrangement of the materials is judiciously made, and each article has given to it a proper description both in the nature and extent.

CCCXCVIII.—NAPIER, 1822.

Hon. William John Napier, F.R.S. Edinburgh, post-captain in the royal navy, vice-president of the Pastoral Society of Selkirkshire, in the south of Scotland, wrote "A treatise on practical store farming, as applicable to the mountainous region of Ettrick Forest, and the pastoral districts of Scotland in general, with engravings;" 8vo. This book is not found in the National Library, but the merits were very great. The patrimonial estate of the author's name, made immortal by logarithmic discovery, is placed in a thinly peopled country of sheep and shepherds, with a few farmers, whose education amounts to knowing the fashions and customs of the olden times. Our author being relieved from warfare had resided among these primeval adepts, had observed their practices, discovered faults, and suggested remedies. He saw that the success or failure of store farming among mountains and snows depended on the shelter and winter food that could be provided for the animals, and on the adaptation of the breed of sheep to the lowland pastures and the Alpine range. His published ideas were assailed with every rancour which prejudice could supply, and continued with much spite and enduring animosity. But time introduced the

Cheviot sheep to all the lower pastures of Selkirkshire, and experience has provided much shelter and winter food for the animals during the bleak storms and deluges of snow that sweep the face of these elevated regions. Capt. Napier's ideas have had the full fruition of success.

CCCXCIX.—MUNRO, 1822.

Colonel Innes Munro, of Poyntsfeld, N.B., wrote "A guide to farm book-keeping, founded on actual practice and upon new and concise principles;" royal 8vo., Edinburgh, 1822. This form of book-keeping occupies 147 octavo pages, and is the most complex idea that has ever been published on the subject. The outset places the fields and qualities of the soil in columns, with the number of acres attached. Then the crops on each field for 6 years, with the abstract of the statements. The inventory follows; schedule of wages; accounts current of animals, grains, roots, cut grass, lands subset, manures; and then collected abstracts, and general accounts, &c., &c., &c. A family account is added, with a general cash-book, which closes the balance of the proceedings. A banker's account and a bill register form an appendix. The form may amuse the gentleman, but never suit the farmer.

CCCC.—SALISBURY, 1823.

W. Salisbury, a botanical nurseryman of Chelsea, wrote "The cottager's agricultural companion;" 12mo. "Hortus Siccus Gramineus, or a collection of dried specimens of British grasses, with botanical illustrations;" London, folio, price 63s. "On raising grass seeds and preparing meadow land;" Nich. Journal, 1810.

The first work only is found in the National Library, and occupies 96 pages of small octavo. The contents are valuable; detailing the general management of soils, manures, and grasses; calves, hogs, and rabbits; orchards and fruits; plants and grains that suit the cottager. The author's elder brother was a botanical author of large repute.

CCCCI.—DONALD, 1823.

Robert Donald wrote "A new system of national and practical agriculture, to relieve distress, reduce the poor rates, and to improve estates;" Guilford, 12mo., 1822. This work is written in hexameter verse, and the subject fills 43 pages of duodecim, along with some minor poems by the same author, who was a nurseryman at Dorking in Surrey. Ample recommendations are given on general subjects, but no details are attempted. Estates are improved chiefly by planting trees, as might have been expected from the author's employment. He recommends leases of land, and the proprietor to bear the chief expense in every project of extent.

The poetry is nothing, but the practical ideas are perfectly sound and correct.

CCCCII.—SKURRAY, 1823.

Francis Skurray wrote "Importance of cultivating spring wheat;" 12mo., price 9s. The London Catalogue alone mentions this work, and gives to the same author other works of a different nature. No other list notices the name.

CCCCIII.—FAIRBAIRN, 1823.

John Fairbairn wrote "A treatise on breeding, rearing, and feeding Cheviot and black-faced sheep in high districts; with observations on laying out and conducting a store farm;" Berwick, 8vo.

Loudon's list of authors is the sole authority for this name and the title of the book, neither of which is found in the National Library. The Bibliotheca Britannica also omits them, as the date of the work being in 1824, the omissions become frequent as the end of it approaches. Our biography loses a most valuable assistance in the cessation of that work, which forms a record of information that is unequalled in the literature of Britain. Loudon's list of writers continues till 1830.

CCCCIV.—SINCLAIR, 1824.

George Sinclair, F.L.S., F.H.S., was a native of the county of Lanark, in the west of Scotland. He was bred a gardener, and had received an education that was superior to the common learning of that grade of society. He was fortunate in getting into the service of the Duke of Bedford, where his botanical propensities could be indulged, and which were noticed by his noble employer, who possessed the georgical element of human nature in a degree that was most usefully developed. Their joint attention became directed to the grass plants, and to the seeming importance of their value and utility. Chemistry was admitted into their deliberations, as that science had reached the abode of agriculture by the pretensions of its value as promulgated by Sir Humphrey Davy. Trials of the several grasses were instituted, both practically and scientifically; each plant was sown on a square allotment of ground, the produce was cut and weighed at three periods of the season—at the time of flowering, when the seed was ripe, and in the autumnal lattermath. A weighed quantity of the grass was submitted to chemical analysis in each period of growth, and the results were very correctly received. The labours ended in a thick octavo volume, entitled "Hortus Gramineus Woburnensis—or an account of the results of various experiments on the produce and fattening properties of different grasses, and other plants used as the food of the more valuable domestic animals, instituted by John Duke of Bedford; to which is added an ap-

pendix, pointing out the different grasses best adapted for the manufacture of Leghorn bonnets;" royal 8vo., London, price 42s. A reduced edition has since been published at 30s.

The portraits of grass plants are most correctly delineated in this work, and very finely coloured, and on that one property a very considerable value is established. The mass of matter is very large and valuable, but unconnected and badly arranged. Prefaces, introductions, and appendixes always denote a gap in the mind of an author; a want of concentration and of collected pith. In the present case, the trials of the different plants were too limited in space and duration; they were not sufficiently repeated, nor varied in soils and under climates of intensity, both in quantity and degree. Little or no dependence for agricultural use can be placed on results that were observed in a garden plot of a few square feet; and far less belief can be pinned to the sleeve of chemistry in determining the nutritious value of any cultivated plant. The potato is seen to contain 27 times more nutritious matter than the turnip; and yet the latter plant feeds animals better than the former, because it is more agreeable to the organs of digestion and assimilation. The trials at Woburn on feeding different breeds of cattle with the same food proved that no two beasts of the same breed progressed alike, but differed widely, and the variation must be owing to the internal structure in the organs of assimilation and in the digestive powers.

The question was finally settled.

Among the grass plants, a very small number are useful to the farmer in cultivation. It requires a combination of properties, which few of them possess; a ready growth on a variety of soils; a bulk of produce in a number of stems that are of medium height; a proportional leafy herbage; and a fair produce in the lattermath, or second growth after the crop of hay has been cut. In these properties combined, no plant yet found equals the ray-grass, which enlightened observation introduced into practice nearly two hundred years ago. In some single property it may be exceeded, but in a majority it is unrivalled.

But very few artificial meadows are made under the present system of agriculture; except where nature has made them of good quality, the alternate system of cultivation gains ground, which consigns land to pasturage for the period of two, three, or more years, when a mixture of perennial grasses is required.

In that mixture, many plants are not entered; the ray-grass ever holds a first place for hay and for pasture, and may be assisted by the fescue, cat's-tail, fox-tail, cock's-foot, and dog's-tail, as the land may be loamy, damp, dry, or arid. For the crop of hay

of one year, the fescue, cat's-tail, and cock's-foot, may be added to the ray-grass; but only in some cases will the addition prove beneficial. Whatever quality may adhere, a bulk must be obtained—not a gross coarseness, certainly, that is beyond the animal liking, but a produce which will give food to beasts on which they thrive, and in a number that will repay labour and cost. No quality will compensate for the want of a quantity, which inherits the legitimate properties of use.

These are our views of the grass plants, and it has been derived from a long and extensive acquaintance with the cultivation and properties of the vegetables.

Notwithstanding this opinion, the present work is much to be esteemed; many opinions are stated, a variety of supposed facts is adduced, and the conclusions are couched in a very becoming manner of expression. If the intended object be not proved, the labours may have shown the contrary purpose, which has before happened, and has been of more service than the original contemplation could have exhibited.

Sinclair became a partner in a firm of seed merchants near London, and died, we believe, about twenty years ago.

CCCCV.—WESTERN, 1824.

C. C. Western, Esq., M.P., wrote "A few practical remarks on the improvement of grass lands, by means of irrigation, winter flooding, and drainage, in a letter to the owners and occupiers of land in the county of Essex;" London, 8vo.

This letter has not been preserved in the National Library, which possesses an epistle on the corn laws by the author, to his constituents in that county, in which he reckons the duties on grain to be essential to the existence of man and beast. If he blundered as much on the flooding of land as on that point, the regret may be small for the loss of the perusal of his recommendations on practical subjects. Like many persons, he wasted his thoughts on mere fancy, as idle and chimerical as the reveries of fathers and monks.

CCCCVI.—MORRICE, 1824.

Francis Morrice wrote "An essay on agriculture, and the management of landed estates;" Aberdeen, 8vo. This statement appears in Loudon's list of writers; the book nor author's name is not in the National Library, and consequently no notice can be made of its contents, nor any opinion formed of the ideas that were entertained, or the suggestions that were offered. The management of landed estates has not been much handled, even at this present time, and something might have been derived in point of information, even from North Britain, where the author seems to have lived.

CCCCVII.—SLANEY, 1824.

Robert A. Slaney, Esq., barrister, wrote "Essay on the beneficial direction of rural expenditure;" London, 12mo. This treatise occupies 239 pages in 22 chapters, and three chapters of appendix, and is an essay of great merit. Expenditure is of three kinds—productive, profitable, and beneficial; as in public works, mines and minerals, and in agriculture and manufactures, which combine the three points. On the subject of agriculture, general examples are quoted of what has been done, and opinions given in what points the doings may be continued. The improvement of buildings, dwellings, and cottages are specially mentioned, with roads and footpaths, planting and enclosing.

If the landowner is not directly paid for expenditures of that kind, the country is improved, the people are civilized, national industry is excited, and the general good promoted. And latterly the value is raised; for without a moral standard, no polity can be raised to command stability. Rational luxuries are much and justly commended, and are a sign of civilized advancement; they are true improvements. The author's ideas are just and profound; the essay contains many subjects in connection with the title of it, as the writer had looked abroad and contemplated what he beheld. The language is neat and appropriate, and well adapted to the subject.

CCCCVIII.—HOLDITCH, 1825.

Benjamin Holditch, Esq., was a farmer near Peterborough, and was for some time editor of the *Farmer's Journal* newspaper. He left some posthumous papers on "The weeds of agriculture," which were collected, arranged, and published by George Sinclair, who has been mentioned as an author. Seventy-eight octavo pages contain the matter, which is divided into four chapters—weeds that infest samples of corn; fallow weeds which require eradication; rampant weeds which encumber the soil; underlying and pasture weeds, with an appendix. The author was a farmer of ability, and possessed an extensive and very correct knowledge on most points of practical agriculture. He enjoyed much public approbation and personal friendship, which were derived from his industry and application.

He was born in 1770, in the Isle of Ely, where his father was a respectable farmer, and gave his son the common education of reading, writing, and arithmetic. Our author very early showed an inquisitive turn of mind, read largely, travelled in America for seven years, and settled in England as a farmer in 1801. His writings were noticed, and procured him the editorship above-mentioned; he attended agricultural meetings, and made correct and judicious reports. His health suffered from the

employment, and he died in 1824. He left some papers on the British grasses, which were not published.

The "Weeds of agriculture" does credit to the author's practical knowledge and observation. The scientific descriptions would be added by Sinclair; but the practical notices are to be understood as the author's. No better work can be in the hands of the tiller of the soil.

The author wrote a treatise "On the treatment of ewes in the lambing season."

CCCCIX.—HAYWARD, 1825.

Joseph Hayward, Esq., wrote "On the science agriculture, comprising a commentary on, and comparative investigation of, the agricultural chemistry of Kirwan and Davy, and the code of agriculture of Sinclair, of Banks, and other authors on the subject;" London, 8vo., 1825. "An enquiry of the causes of fruitfulness and barrenness in plants and trees, arranged as a dialogue;" London, 1834, 12mo.

The first work contains 220 pages on breeding and rearing animals and vegetables, cultivation, plants, leaves, blight, paring and burning, soils and earths, haymaking, orchards and cider. The author dates from Lyme Regis, Dorsetshire, and shows a very sound scientific judgment on all practical points. But many disputed points seem not worth the labour he has bestowed upon them. No new fact is adduced or theory propounded; the whole argument is to establish or confute, which do not in any way promote an advancing cause, which rests on established usages.

The second book is a duodecimo of 292 pages, containing a dialogue between question and answer, on the scientific causes of sterility and poverty in vegetable growths. The subject is extremely well handled, but in a practical view it merits no comment. The author wrote on gardening.

CCCCX.—BAYLDON, 1825.

J. S. Bayldon was a land agent and appraiser in Yorkshire. He wrote "The art of valuing rents and tillages, and the tenant's right on entering and quitting farms;" London, 8vo., 1825. This work passed through four editions during the author's lifetime, and two since his decease; being composed of sound principles and judicious performances, the book has been reckoned a standard of the kind, and looked to as an authority. The autumnal entry to farms leaves unpaid the whole summer's work that has been done by the outgoing tenant, and causes the valuations which form the contents of the work now mentioned. The money required to be paid by the incoming tenant is a very heavy drawback on the means of improvement, and has

long been a subject of complaint. The first of May is the most eligible time of entry; the labours of the farm are at that period of the year most separated in the performance, and the crops are farthest removed from interfering with each other. The former entry creates much confusion by the crop of grain remaining to the waygoing tenant, unless it be purchased by his successor, which would be an improvement on the present practice. A complaint of long standing has now become a subject of discussion; and when just and reasonable demands are pushed forward to be granted, a denial cannot be long received, and a beneficial alteration may be speedily expected.

CCCCXI.—DACRE, 1825.

Rev. B. Dacre, A.L.S., wrote "Testimonies in favour of salt as a manure;" Manchester, 8vo., 1834. The book is of 233 pages of testimonies in favour of salt as a manure, which failed to lead to any use of the mineral in that way.

CCCCXII.—BUCHANAN, 1825.

George Buchanan, civil engineer, wrote "A treatise on road making, railways, wheel carriages, and the strength of animals." This work is not found in the National Library, and the above statement is taken from Loudon's list of authors. The subject concerns the farmer; his occasional attention may be directed to road making, and the time may not be distant when moveable and temporary railways will be used for the purpose of affording much ease and convenience to many operations of the farm. All these subjects must be heeded by the cultivator of the soil; the direction of the labour, and the performance of it, are most essential ingredients in the estimate of giving and receiving that is made by the farmer.

CCCCXIII.—WAISTELL, 1826.

Charles Waistell, Esq., chairman of the committee of agriculture of the Society of Arts, compiled "Designs of agricultural buildings, including labourer's cottages, dwelling houses, and offices." Edited by his nephew, Joseph Jopling, architect, London, 4to., 1826. This work contains 107 quarto pages of letter-press, four designs of cottages and dwelling houses, five designs of farmeries, three plans of gates, two corn-rick stands, and an old farmery improved. These designs claim but little merit at this present time; the labourers' cottages are too small, in having only one apartment; the dwelling house of the farmer is joined to the out-buildings, and the farmeries are limited in the necessary accommodations. The cart-lodge facing the south, is very objectionable, and also to have its opening into an interior yard. The fold-yards are too few in number, and the shelter sheds are

not adequately provided. The pigsties are singly scattered about the buildings, placed in corners that are very inconvenient of access. Swine should be entirely separated from cattle, as the smell is very disagreeable. The dairy and the calves' house are shown, but the cowshed is not marked in any one of the designs. It should be in close contiguity to the calves' house, and the dairy not far distant. The author had not been a competently practical person; the dairy under the roof of the farmer's dwelling-house is very objectionable on account of coolness, and also to have the kitchen with a window forming a part of the front of the house. These arrangements show a faulty discernment of the proper details.

CCCCXIV.—HENDERSON, 1826.

Andrew Henderson, land surveyor and valuator, Montrose, wrote "The practical grazier, or a treatise on the proper selection and management of live stock; with cures for the most prevalent diseases, likewise showing a proper system of grazing different soils in various climates and situations, improving waste lands, draining and irrigating, with useful hints to the landlord, tenant, and practical grazier;" 8vo., Edinburgh, 1825. This work contains 446 octavo pages, with a frontispiece in a plan of farm offices. The design is not a bad one, but wrong in excluding the sun from the yards by a building in the front, or shelter sheds. It provides a separate piggery, as swine may be used in North Britain. The feeding houses for cattle are well provided with the ready access of turnips and straw. In our opinion the design exceeds any plan of Waistell's.

The diseases of animals are stated at too great length, as good treatment will nearly banish all distempers; but the general management and directions given are wholly unobjectionable. The portraits of the animals are very faulty, being caricatures of no low degree. There is another occasion of observing the very inferior artistic skill of Scotland when it attempts animal portraits, even when it copies, and does not delineate from life. In no point of agricultural industry does such a difference exist between the southern and north parts of the kingdom. On the other hand, in originating, constructing, and delineating implements of tillage, Scotland is as far ahead of England.

The author treats shortly, but very sensibly, on irrigation, drainage, and improving waste, of which points his ideas are very just, and conclusions well founded. The work is very creditable.

CCCCXV.—STEELE, 1826.

Andrew Steele, a proprietor in the neighbourhood of Edinburgh, wrote "The national and agricultural history of peat moss;" Edinburgh, 8vo. The

volume contains 401 pages, and details much correspondence on the nature and value of peat and value of peat moss, the use of it as a manure, and its capability as a soil. Neither chemistry nor practice has yet done much with peat; and this author advances nothing beyond its use as fuel in the true formations, and as land in the mossy earths.

CCCCXVI.—MITCHELL, 1827.

James Mitchell, a retired grazier of Yorkshire, wrote "Sketches of agriculture, or farmer's re-

membrancer, alphabetically arranged;" London, 8vo., 1827. The work contains 355 pages, in which the connected matters of agriculture are explained under the alphabetical heads. The treatment is very simple and concise.

"The graziers' ready reckoner" was done by the same author, containing tables of contents of the weight of animals from the dimensions in girth and length. The author also wrote "Dendrologia, or a treatise on forest trees." The works show a person of varied knowledge.

DISEASE OF PLANTS.—TURNIPS.

It is next to impossible to make any progress in studying the diseases of plants, except by experiment tending to show the causes of the injury. All mere observation, all reasonings from analogy, all closet lucubrations are utterly futile and useless. Field experience, not made in the ordinary routine of farm cultivation, but by a system of well-ordered experiments made for the purpose of investigating the subject itself, are absolutely necessary.

To no disease does this apply with more force than to the finger-and-toe in turnips, and yet we see how little positive experiment has ever been made. The only specific experimental investigations of the disease, which we remember to have seen, are those of Mr. Milburn, of Thirsk, detailed in the *Journal of Agriculture* of July last, and which were consequently out before the Highland Society's investigations, chemical and practical, were published; and we will just review these experiments to show how far they supply any of the desiderata necessary to be known in studying the disease.

The first part of the paper is devoted to some account of practical struggles against the disease, the tendency of the whole of which is that with slight exceptions the frequent repetition of the turnip is very encouraging to the disease: that exception is land recently taken out of grass. But assuming that the soil is deficient in some element necessary to the healthy development of the turnip, the principle is not very different between an absence of that element in the first instance, or a denudation of it by frequent repetitions of the crop which consumes it.

"Seasons," he observes, "have little influence in producing the disease, though the one most favourable to the early growth of the plant seems the most adverse; for the more vigorous its growth in its early stages, from any cause whatever, the greater will be the intensity of the visitation."

Preceding crops, except in the sense of removing the turnip as far as possible from its like, seem to

have little influence; though he imagines tares sometimes tend to do injury and promote the disease.

Time and manner of sowing seem to be almost without influence on the disease. "Swedes," he says, "sown in May, rape sown in August, and charlock growing spontaneously in March, are sometimes one and all sufferers."

Manures, he thinks, as such, seem unable to resist its progress. He enumerates several—guano, bones, and acid phosphate, nitrate, &c.—all powerless before its ravages.

He then details his experiments made in 1851 and 1852, on the same land. His first object was to select a soil perfectly free from the disease; and having secured this, he carted and spread over it six inches of soil from one of his fields, where he knew from previous experience the disease was completely rampant. Here the good soil was the subsoil of the disease. He then divided that into six stetches, and manured as follows, and a seventh without manure:—

No. 1. With magnesian lime,* at the rate of 3 tons per acre, in a fallen or effete state.

No. 2. The same lime water-slaked and "quick," or hydrate of lime, same quantity.

No. 3. Intended to have been pure mountain lime, but failed in getting it, and dressed it the same as No. 1.; all applied on the 6th of June.

No. 4. Salt at the rate of 25 bushels per acre.

No. 5. Caustic potash at the rate of 2 cwt. per acre, drilled with the seed.

No. 6. As the soil was very light, pounded clay was applied drilled with the seed at the rate of 16 bushels per acre.

* He gives the analysis of the lime thus:—

Carbonate of lime	54.62
Carbonate of magnesia	43.93
Alumina, oxide of iron, and manganese	80
Sulphate of lime and common salt	05
Insoluble matter and silica	60

No. 7. Nothing.

The turnips were sown on the 18th of June, and all manured with dissolved bones treated with sulphuric acid, and the kind of turnip was White Norfolk. He says "I watched their development narrowly almost daily; Nos. 4, 5, 6, and 7, were the most vigorous and grew rapidly; No. 2, the worst by far until after the appearance of the cotyledon leaves. From this time they gradually improved till the first week in August, when they presented no great difference from the rest, though appearances were a little in favour of Nos. 5, 6, and 7."

In the second week of August he had all the plants examined, and on Nos. 6 and 7 there were "little knots distinctly felt on passing them between the finger and thumb." The rest were not affected. On the 15th they were again examined; Nos. 5, 6, and 7, had their growth arrested, and were turning yellow, and the leaf development had stopped. The roots then had knots the size of a horse bean, but quite sound and unpunctured in the skin. All the rest sound. In ten days more the swellings in Nos. 5, 6, and 7 had begun to crack, and slight decay set in. Then to his mortification disease attacked also Nos. 1, 2, 3, and 4, though less severely; and at the end of August, 5, 6, and 7 had all gone off, and 1, 2, 3, and 4 were partially diseased. In the first week of September these observations were confirmed, 5, 6, and 7 being entirely destroyed, had become a prey to several kinds of maggots, centipedes, &c.; Nos. 1, 2, 3, and 4, small and partially affected. These plants were all removed, and the land again sown. The applications in the following year were—

- No. 1. Limed with caustic magnesian lime (as before).
- No. 2. Limed with 20 bushels of salt per acre.
- No. 3. Limed as No. 1.
- No. 4. Salted with 40 bushels per acre of salt.
- No. 5. Salted with 20 ditto ditto.
- No. 6. Nothing.

The result of this was as follows:—

- No. 1. All sound.
- No. 2. All sound.
- No. 3. All sound.
- No. 4. All sound.
- No. 5. Slightly affected, but less than in 1851.
- No. 6. Slightly affected, but less than last year, and very long tap-roots.

He imagines all had got more or less into the subsoil this year.

The conclusions he drew the first year were as follows:—

- "1. That the disease was not from the subsoil.
- "2. That it did not arise from a want of dry or caustic potass.
- "3. That a small quantity of surface-soil conveyed the disease.
- "4. That the disease manifested itself before any insects attacked the plants, and the insects only followed the excoriations and decay.
- "5. That it showed the disease thoroughly in the soil. And
- "6. That though salt and magnesian lime would not absolutely cure the disease, they had both a very ameliorating tendency."

The conclusions of both trials he thus gives:—

"I think it not an improbable conclusion that the cause of the disease is a want of caustic lime or common salt (*may it not be the chlorine which replaces the alkaline lime or soda?*) in the soil."

Take this with the fact of a deficiency of chlorine in diseased, as regards soil free from the malady, with the fact also of chlorine being in greater quantities in the sound than in the diseased bulbs, and say have we not got some light to guide us, at least, in future experiments as to the cause and cure of the fingers-and-toes in turnips?

We now leave the subject to the experimentalists of 1854, and hope they may be induced to try their skill in finding out its cause and cure, trusting to be favoured with the results of their practice for the benefit of the agricultural interest generally.

FISH MANURE.

One of the great difficulties, so far, in dealing with the question of fish manure, has been with regard to the dependence that can be placed on the supply. Admitting the value of the material, and the certainty with which it would command a market, the point to be considered was, where we could best erect our store-houses or manufactories—Where could we ensure constant employment for those to be engaged in the business, and from what quarter could we bring it to use on fair terms for

both seller and buyer? So far this had been by no means cleared up. The sea, to be sure, was known to abound with that we required; and certain parts of the English and Irish coasts were referred to as the most eligible districts for commencing the experiment. No one, however, spoke with any great confidence as to what promised after all to be but an occasional occupation, and somewhat hazardous employment of labour and capital.

The first grand objection may be now in some

measure removed. At the weekly council meeting of the Royal Agricultural Society, on Wednesday, Feb. 22, Mr. Bullen especially addressed himself to this branch of the subject. Himself an Irishman, he appeared to have no great faith in the resources of the sister kingdom, while he paid as little attention to what we might be able to procure even nearer home. His hopes and advice at once pointed to Newfoundland. It was here that the supply of fish was almost unlimited: it was here that thousands upon thousands of tons of offal were season after season thrown back from the platforms, to which the fish are brought in to be cleaned. There could be no question, either, as to how much this quantity of the material might be increased, were it found desirable to have it. Not only the offal, but inferior fish of different kinds, might be converted entire into manure; while the bodies of the seals, now killed merely for their skins and blubber, would give a still further increase of animal matter. Mr. Bullen, in fact, was amply prepared with statistics on the subject, obtained chiefly from the fisheries, and all of which are well worthy of further consideration. A summary of these, as prepared by him, appears elsewhere, under the proceedings of the Society.

Another difficulty still to be surmounted is the labour to be employed in the manufacture, or mere collection of this manure. It was naturally enough dwelt on by several of those who followed Mr. Bullen, as well as directly referred to by him. We must not forget that on the authority of Mr. Lawes a precisely similar experiment on this coast failed almost entirely from this very cause. Mr. Bullen admits—"The chief difficulty to a successful manufacture is the want of labour, *which is dearer at certain seasons in Newfoundland, and more scarce than anywhere else*, as there are only 120,000 inhabitants in the island; and they are so exclusively occupied in the fishing and sealing seasons, in summer and spring, that they cannot attend to anything else."

But then, according to Governor Hamilton, "unfortunately there is little or no employment for the labouring population during the long period which intervenes between the close of the cod fishery in summer and the commencement of the seal fishery in spring," and that "in the mode and processes of conducting the fisheries themselves there is a great want of economy, and a disregard for improvements which the application of modern science would suggest, and which might be rendered available in advancing the industrial pursuits of the colony."

It is obvious, from this, that during "the season" we should be content with merely saving the offal—collecting and storing it until labour could be had

on more advantageous terms. It is very doubtful, though, whether even this could be done without the importation of hands for that purpose. We are told by Mr. Lawes that "the fishing season is confined to a short period during summer, and time and labour are then so valuable that every man, woman, and child is employed in some process connected with the preparation of the cod as food. Indeed, so important is it that the population should not be occupied with other pursuits, that the cultivation of the land is neglected; and the proprietors of the fisheries supply the people with food and other necessaries imported from other countries."

It is very evident, moreover, that with extended machinery for the purpose, a great deal more fish might be prepared for food. The men, too, would naturally command higher wages in this occupation than they could expect in the other. In fact, as Professor Way happily illustrated it, sending men to make manure when there was fish to be cured would be very like exporting them to Australia to cultivate the soil when there was gold to be dug. It would be difficult to keep them to their contract.

Collecting the bodies of the seals would be attended with far more expense.

These are serious difficulties, no doubt; but we will not say they are invincible. Indeed, we are hardly so ready to give up the supply of this manure we might perhaps procure on easier terms nearer home. It is well known that at present the fishermen, in many parts of both England and Ireland, only work according to the demand for the commodity, and that they could readily furnish twice or thrice as much as they now do. Is it too much to expect that they would give their attention to a market which, if at lower prices, would unhesitatingly take everything they had to offer? When some of the bone-manure mills were first established, there were serious doubts as to the manufacturers being able to obtain anything like the quantity they required. They soon found, however, that the more they used, the more were there collected for them.

There is no topic could have come more apropos, none more worthy of the attention of a Council Meeting of the Royal Agricultural Society, and few that would promise to lead to better results, than that which was considered on Wednesday last. It was not confined only to fish-manure; but various other materials were named, which might be advantageously used by the farmer. Mr. Cuthbert Johnson and Mr. Slaney reverted to the wealth to be obtained from the refuse of our towns, and gave hopes of our soon being able to make it available. Mr. Caird dwelt on

the value of blood as a manure, and the portable form in which it might be taken from sugar refiners and others who had the first use of it. Mr. Fisher Hobbs spoke to his experience of sprats, and the price at which they could be obtained; and Professor Way as to the difficulties hitherto found in extracting the oils from the fish. It was a discussion, in fact, in which the knowledge of the practical and that of the scientific man were brought to bear well on each other; and one that, especially under present circumstances, could scarcely be made too public, or, in other words, invite too much attention. To what resources are we to look for our supplies of manure?

We believe there is a certain etiquette, in dealing with these weekly meetings, that we may have al-

ready infringed. A member must bring himself only to recollect what he may hereafter find recorded in the transactions of the Society. We candidly confess our regret that the rules will not permit such a discussion as that we refer to being given at greater length. We should be the last to advocate the Society being converted into a mere handle for any man's name who wanted to make a speech or "a point." At the same time there might be a certain discretion allowed. At any rate a meeting like that of Wednesday last loses its chief value from the too rigid exercise of such a condition. Whatever some of the Direction may think, these weekly meetings are, or *might* become, one of the most useful features in the proceedings of the Royal Agricultural Society.

G U A N O.

To transmute base metals into gold at pleasure—to live for ever in this world—to find one remedy for all diseases—and to be able by one substance to dissolve at leisure every other substance—have from time to time (with sundry other similar objects, such as to invent machinery to go for ever) occupied the curious, the ambitious, or the studious; and if ever a philosopher's stone, the elixir of life, the infallible catholic, the universal solvent, or the perpetual motion were discovered, it is the application of guano in agriculture. We know of no crop which it will not benefit, if properly applied. We are unacquainted with any soil which it will not improve; we can scarcely point out a stage in the crop or a season when it may not be advantageously applied. The fear at one time, of sowing it when rain might not speedily fall, is now happily obviated by all kinds of water drills and liquid spreaders; so that it may be at once considered as a source of food, of medicine to the plants, of fertility to the soil, and of money to the occupier.

And yet this very article is now so scarce, that in times when the necessities of millions of human beings are demanding more food—when prices are so high as to stimulate the farmers to grow as much grain as possible, and so make hay while the sun shines—they are told they cannot have the quantity for either love or money. A slight attention to present facts will show us the immense importance of this question. The average wheat-growing acres of land in Great Britain are given by M^rQueen at 5,500,000 acres. This is probably below the average number; but this year, when a large breadth is sown in all directions, it may be taken at safely 6,000,000 acres.

In this rapid stimulus given to the growth of

wheat, much of this land is undoubtedly unfit for a crop. In ordinary circumstances, three-fourths of the land is capable of giving more than it does; but this year there is a far greater breadth, to which the application of fertilizing manure would be decidedly beneficial.

But assuming that three-fourths only of this land, or 4,500,000 acres, could have its produce increased by one quarter per acre, we have at once a large amount of corn more available for the farmer—so many quarters of corn saved to the nation politically, and so much supplied to the community, without the cost of freights and occupation of shipping, and without having to export our specie. But then these 4,500,000 acres would take nearly half a million of tons of guano—say 450,000 tons—and this would be an impracticable quantity.

Still when we find that the United States last year, without this stimulus, obtained 70,500 tons, it only requires us to take little more than seven times as much as the United States to supply our people with two millions and a quarter in money value of corn for our population.

Nor need we fear the exhaustion of the supply, even if vastly more used than it is. Mr. Caird said he thought the Chincha Islands alone contained 12,000,000 tons; and some French officer, by survey, has made the quantity 12,376,100 tons by measure—equivalent to some 16,501,466 tons as sold in the market.

We believe both calculations to be vastly under the mark. In these islands, the guano is from 40 to 100 yards in depth.

In the year 1845—no long period ago—M. de Rivero made a survey and report of the quantity by weight and measure; and later still, in 1847,

Mr. Edward Cater made a similar survey, and, taking the guano to weigh two cubic yards to one ton, he found in the Chinchas,

In the Islands of the North,	15,200,000	cubic yds.
" Centre,	12,900,000	" "
" South,	8,400,000	" "

Giving a gross amount of guano, in the Chinchas alone, of 18,250,000 tons.

But this is not nearly the whole available resource. North of these are the Lobos Islands, with Guape and Ferrol; and these contain a quantity of no less than 854,086 tons.

Yet more important still are the group south of the Chinchas, consisting of Chipana, Huanillos, Pabellon de Pica, Puerto Ingles, &c., &c.; and these contain masses of guano amounting to 7,621,407 tons, giving an aggregate of the whole of these Peruvian Islands, not of 16,000,000, but of 27,024,493 tons. We cannot imagine why some steps as effective should not be taken by our Government to obtain for us a supply as open, as free, as cheaply as the United States have; for it is a subject as worthy of the English people as of the speech of the American President.

It may not be amiss to remind our readers of the practical points to attend to, in the application of guano—for such, at least, as are fortunate enough to obtain it.

First, Never mix it with anything. All lime-

composts, ashes, and similar ingredients, too often contain enough caustic alkali to drive off the ammoniacal parts before the soil can surround and absorb them. A vast amount of mischief and loss often follows this sad mistake. If they could apply it alone, the soil can best adapt it for plants.

Second, Mix as much as possible with the soil, not too deeply, but plough it in after sowing it broadcast, unless it be for beans, or drilled and ridged crops, when it may be sown on the surface before the ridges are made.

Third, If applied as a top-dressing, always apply it, if possible, before rain, or when snow is in the ground; and, if on arable land, harrow, hoe, or scuffle, if possible, immediately after the operation.

Fourth, The best mode to apply it is by water. A slight solution of it is by far the most powerful and speedy application.

Fifth, If sown with drilled corn, or indeed any seed whatever, it should never come in contact. It is not a bad plan to sow broadcast after the corn-drill, and then harrow, as it is kept in the nearest proximity to the seed, without coming in absolute contact with it.

And, lastly, Be sure you get, if possible, the genuine article. *Cheap* guano there is none. It must be above a certain maximum price, or it cannot be genuine. It is best to have a quantity purchased together, and analyzed by a practical chemist.

WOODS, HEDGE-ROWS, AND HEDGE-ROW TIMBER.

We recently offered some cursory remarks on the aspect and condition of the woods, hedge-rows, and hedge-row timber of this country, compared with the like productions on certain parts of the continent of Europe. In reverting to the same subject as one eminently deserving the thoughtful consideration of those who possess an interest in the broad acres of England, we glance for a moment at what our ancestors possessed, did, and thought of their woods and hedge-row timber. In the prosecution of this purpose, it is not our intention to go back to the direful story of the first tree, the great transgression of plucking and eating the fruit, and the penalty which immediately fell on our first progenitors and their offspring; nor need we dwell upon the fact which we also learn from the same source, that Solomon possessed and encouraged the growth of trees, for he had not only an orchard for trees "bearing spices," but he had collected timber trees, and amongst those the cedar, and this he must have imported from Judea. In hastening back again from thus hurriedly touching the very ex-

trinity of time and things, we pass Pliny discoursing on trees, and feel shocked at the idolatry of the primitive naturalist, as he tells us that "in old times trees were the very temples of the gods;" and further asserts, that "verily we ourselves adore not with more reverence and devotion the stately images of gods within our temples, made though they be of glittering gold and beautiful ivory, than the very groves and tufts of trees wherein we worship the same gods in religious silence." We are, nevertheless, indebted to the same great authority for much valuable information, besides the fact that in his time the great landowners then, just as the great landowners now, grew coppice-wood for fuel, props for vines (hops), and rails for fences, willows for baskets, and osiers for hoops; and, among the cultivated trees in those times, special notice is also taken of the larch as one of their most useful trees. We observe also, in passing, that the whole of the native trees which were known to our Saxon ancestors were the birch, holly, alder, oak, yew,

ash, Scotch pine, mountain ash, elder, and half-a-dozen dwarf shrubs; and these were found sufficient to supply the economical and industrial requirements of the period.

Besides the above, foreign trees began to be introduced about the time of Henry the Eighth; and, if we take as an example of what was doing in this particular at the time, we learn from certain records that, in 1588, Sir Thomas Cecil rebuilt "Wimbledon House," and that in 1649 the house and grounds were reported upon to the Government of the day. In this report we are informed that the garden contained mazes, alleys, knots, wildernesses, and many strange trees; amongst these was a "faire bay tree"—"a very faire tree called the Irish Arbutis, very lovely to look upon, and worth £1 10s." In Girrard's garden, in Holborn* (1596) there were several foreign trees—as the Judas-tree, the white mulberry, the laburnum, pinaster, laurestinus, lotus, &c., &c. In Cocker's "Survey of Dorsetshire," which is believed to have been written in the time of James the First, we are informed that Sir Walter Raleigh built, in "the parke" adjoining the old castle, "a most fine house, which he beautified with orchardes, gardens, and groves of much varietie and great delight." The whole of the woody plants introduced to this country up to the end of the sixteenth century were under one hundred; and amongst these, as large growing kinds, were the common spruce, the plane-tree, the black and white mulberry, walnut, quince, evergreen, oak, laburnum, celtus australis, and those just noticed.

In the following century (seventeenth) the importation of trees was still more extensive. Dr. Compton, Bishop of London, Tradescant Evelyn, and the Rev. John Banister were amongst the chief promoters of this department of rural economy; and in their time, notwithstanding the difficulties of the period, many ornamental trees and some useful timber trees were introduced, chiefly from America, sent home by Banister to his patron Bishop Compton, under whose auspices Banister was employed as a missionary in America. The Bishop of London's garden at Fulham owes its celebrity to the early efforts of Dr. Compton, who presided over the see of London from the year 1675 to 1713. The impetus and taste which were thus given to the introduction of foreign trees by the example of Bishop Compton became very general, and, notwithstanding the great difficulties arising from the turbulent spirit of the period, vast numbers of useful and ornamental trees were introduced; and we shall only stop to specially notice the fact, that in the Bishop of London's grounds at Fulham, in 1683, was planted, by

Dr. Compton, the first Cedar of Libanon. In the grounds formerly belonging to this excellent prelate it deserves to be remembered, were very recently the remains of some of the finest and oldest lime trees in this country. It was also during the time of Bishop Compton (about 1688) that the introduction of avenues of the lime tree became fashionable in England. About this period, also, we learn from Evelyn's *Sylva*, the tulip tree was introduced by Tradescant, from Virginia, and was spoken of at that time as "a poplar." Amongst the singular records relating to the middle of the seventeenth century, and the persons then most concerned in the introduction of trees, appears the interesting fact that the son of John Tradescant having inherited his father's museum, of which he published a catalogue, died 1662, and bequeathed his museum to Mr. Ashmole, who was at the time a lodger in Tradescant's house at Oxford. Hence the origin of what is now known at the place in question, the "Ashmolean Museum." Surely in fairness the name of Tradescant ought to have been associated with this institution.

Some of the more prominent incidents immediately bearing on the subject in question during the eighteenth century may be mentioned: such as the introduction of foreign trees, which became so general as to wholly cast into the shade all that had been previously done. The taste for arboriculture now ascended from the humbler ranks of medical men, merchants, and tradesmen, and diffused itself extensively among persons of wealth and title. For example, the Princess Dowager of Wales established the arboretum at Kew, and, following her example, Archibald Duke of Argyle at Whetton, and the Duke of Richmond at Goodwood, became great patrons of planting. Also Pope, Addison, Kent, and others created a taste for trees and landscape scenery; hence at Claremont, Syon, Croome, Braxted Lodge, and Upton House, still exist more or less of the largest of the earlier introduced foreign trees, and may be called the first rudiments of what in the present day are termed arboretums. Few persons who care to know anything about trees but have heard of the wonderful things which were recently effected in the lifting of large trees by the Earl of Harrington at Elvaston, near Derby. It must be that there is nothing new under the sun; for in 1734, more than a hundred years ago, we have the most minute details given upon authority the most credible,* that "Lord Peter was the ornament and delight of the age. He lifted in the spring of 1734, twenty-four full grown elms, about 60 feet high and two

* Now Ely-place, and the brow of the hill towards the ditch.

* We refer to a manuscript in the hand-writing of Peter Collinson, in one of Miller's Gardener's Dictionaries, in the possession of the Linnean Society.

feet in diameter, all grew finely, and now (1764) are not known from the old trees they were planted to match," and "in 1738 he planted an avenue of elms 15 or 20 years old, cedars 20 years old, and larches 11 years old." Thus we find the improvers of the present time left but small room to plume themselves with any very large measure of practical skill on this subject which was not as fully and successfully practised by those who preceded them in the same pursuits a hundred years ago. In 1761 the Duke of Richmond purchased of a gardener of the name of Clarke a thousand fine cedars, which he planted at Goodwood.

From another source we learn that Peter Collinson (already noticed), who was a linendraper in London, a Quaker, and a great lover of trees, saw in the garden of Mr. Vernon, of Twickenham Park, in 1748, the first weeping willow, which had some time previously been brought by its owner from Aleppo. It is not less worthy of notice that this said Peter Collinson, who, acting upon the guiding principle of the Society of Friends, in keeping his expenditure always at a goodly distance below his income, was necessarily compelled to become rich, and therefore established himself in a mansion and large grounds at Mill Hill. This mansion and grounds, after passing from his son Michael, fell into the possession of Richard Antony Salisbury, a kindred spirit, whose name is handed down to us

in many ways as a man of science and a lover of trees and natural history: the Maiden-hair tree (*Salisburya adiantifolia*) commemorates the name of Mr. Salisbury. But what we wished to notice was the fact that about the end of the last century the mansion, garden, and grounds of Collinson at Mill Hill were purchased by the Protestant Dissenters, and is still known as the Dissenters' Grammar School at Mill Hill. Collinson's stable was transformed into a chapel. The whole of the erections have since been pulled down and rebuilt; but some of the earliest introduced trees of their kind were first planted there, and about a dozen of these still exist, and are scrupulously watched over by the society in question.

In contemplation of a more practical consideration of what trees are, in their various relations to the progress of industry and civilization, the comforts and habits of the people of this country, we have been thereby led into the preceding path; but in future papers our road will carry us through a more familiar highway, where we shall part company with Pulteney, Sir Thomas Cecil, Bishop Compton, John Banister, Tradescant Gerard, Sir Walter Raleigh, Sir Hans Sloane, Parkinson, Pope, Addison, and others, who have all left living memorials of their zeal and love of natural history, but especially trees, and join the converse of those who occupy our own times.

CATTLE REARING AND FEEDING IN ABERDEENSHIRE.

STR,—As the above subject may be interesting to many of your readers, who are not acquainted with the successful and economical system of this district, I have collected together the following notes, which I hope may be of interest, and perhaps profit to many. Previous to entering upon the immediate subject before me, it may be as well to state the system of cropping followed out in this district.

The greater part of this county and the neighbouring one (Banffshire) is farmed on the five-course shift; viz.: 1, turnips; 2, oats, sometimes barley; 3 and 4, grass; 5, oats. I should mention that many first-rate farmers are extending the five to a six shift, by taking three years grass—thus, 3, 4, 5, grass; 6, oats. The soil is in general fine, light, turnip land, peculiarly adapted to the growing of green crops. In some of the best districts to the east of the county, I have seen as fine grass and turnips as could be found in any county in the island. I have heard south-country farmers say, that all the success of the Aberdeenshire farmers in rearing and feeding cattle was owing to "something in the land." Whether it is indeed owing to that, or to their judg-

ment and skill, I will leave others to judge; and will now proceed to my subject, which, to avoid useless repetition, I shall divide under three heads: The cattle, their lodging, and their treatment.

THE CATTLE.—The exclusive breeding of the pure Aberdeenshire cattle, or Angus and polled Galloways (as they are otherwise called), was given up, except by a few breeders, upon the introduction of the short-horn into this country; the farmers finding that they could get a better beast at an earlier age by crossing the slow-growing Aberdeenshire (with his light hind-quarters, but well-formed fore-quarters and hardy constitution) with the shorthorn, so celebrated for his early maturity. The cross they have obtained, when well bred, combines the perfections of the two breeds—the weighty fore-quarters of the Aberdeenshire with the perfect hind-quarters of the improved shorthorn, and the easy temper of both. Of course, in a large country, where crossing has become the rule, there are many rough inferior beasts bred; as many have not the skill to choose a good bull for the purpose, and good cows to put him to. From the bulls one sometimes sees through the country, it

would appear as if the owners did not care what they were like, as long as they were shorthorns and to be got for little money.

There are some gentlemen who have tried, with great success, a cross between the shorthorn and a West Highland cow; and certainly the produce is of the finest quality, and always commands higher prices than any other kind of cattle in this district, but they have the drawback of being rather fresh in their tempers. They are a paying cross, as there is little expense upon the mothers; the cows doing admirably on any rough pasture, or in an old wood, during the winter, thus saving the most expensive part of the year's keep. Some breeders have produced such fine animals from this cross, re-crossed with the shorthorn, that they have been pleased to pass them off as pure Teeswaters; but however fine the individual animals may be, I suspect they would prove a bad bargain to those using them as shorthorns, as, wanting the originality (if I may so call it) of the parent breeds, they would fail to stamp their own perfections upon their progeny.

We have also in this and the neighbouring county several breeders of pure shorthorn stock, several of whom have been very successful. Their young bulls, which are dispersed through the country by annual sales, are generally superior, and are in great favour; but as a stock for ordinary rearing and feeding, the shorthorn does not seem likely to become established in this quarter. Complaints are brought against them as being rather subject to various diseases; especially the cows at the calving, and the young stock. Although, as a writer in your pages observes, they are not "hothouse plants;" yet they do not seem sufficiently hardy for this district. I may mention that the bull Grand Duke, sold in England for £1,000, was for some time in the hands of one of our breeders here; and left, I believe, some promising stock behind him.

As I before mentioned, there are a few farmers who still continue to breed the polled Aberdeenshires; but although they have very fine heads, and produce some noble animals, and prizes are given for them at all the local shows, I much doubt if they will come into general favour again in this county, whatever they may do in the counties south of this, where "doddies" (as they are called) are held in great estimation. An extensive breeder of the Aberdeenshires was once very outrageous at my remarking, when looking at some very fine young heifers of his, that they would throw splendid stock if put to a shorthorn bull. He indignantly asked, "What would be the use of crossing, when he could produce finer animals of that breed than any in the kingdom, ages being equal?" However sincere he may have been in this opinion, few here, I think, will agree with him. But when the Aberdeenshire farmer comes to

choose a beast to tie up and feed for the butcher, he cares little whether he be horned or polled, pure or cross, so that he possesses the points of what he considers a profitable feeder. The principal of these are: a broad straight back, lengthly from the hooks to the tail; well set up at the tail; a deep broad chest, fine neck, clean head, and a large, prominent, placid eye; but little space between the ribs and the hooks; and the ribs spreading well out, and covered with plenty of good, loose, thickish, but soft and buttery skin, covered with fur-like hair, in which he can stow away to good purpose the food put into him.

HOUSING.—Our cattle are tied up in pairs in byres, not only the feeders, but all the young stock. There are two good reasons for this system. First, the climate is too cold and changeable for out-door feeding; it having been satisfactorily proved that warmth is as necessary to the economical laying on of flesh and fat, as food. It might be well urged that the young stock would be better, and thrive faster when put on the grass in the spring, if they were kept in courts in winter; but to this I would oppose the second reason for the course pursued, namely, that working upon the five-course shift, and thus having only two-fifths of the land in corn, and requiring a large portion of the straw for fodder, both for horses and cattle, they would require more straw than we could possibly afford, to keep them anything like dry and comfortable in courts. The accommodation for cattle in the homesteads throughout the country is generally good. The byres are well ventilated, and sufficiently commodious, being laid with drains or gutters for carrying off the liquid manure either to the tank or compost-heap: great attention is paid in keeping them clean and comfortable. Turnip sheds are placed near, and opening into the byres, so that the turnips are kept free from frost and wet; which is important, as cattle never thrive well when their turnips are given them covered with frost and hard as bullets; indeed they rather fall off.

REARING AND FEEDING.—Of course there are slight differences in the treatment of cattle through the district; but as the differences are not important, I shall describe only what I consider the best system. We generally like our cows to calve early in the year, say from January to April; and if possible, two or three about the same time, so as to be able to put two calves to one cow, and reserve the other for milk. If this cannot be obtained, and the cow calving happens to be a good milker, we take the calf from its mother immediately it is dropped, and put it into a small pen, where it is supplied three times a-day with new warm milk. For the first six days it is found expedient to regulate the quantity of milk given; but after that the calves get as much as they will take if the milk is

plentiful; but if there is a scarcity, it becomes necessary to diminish the quantity given, and mix it with some other nutritious substance. Some people use eggs beaten up with the milk; but as this substitute of course must depend upon the supply of eggs and their price in the market (as it would not do to be giving calves eggs when they could be sold for 9d. or 11d. per dozen), I think the best and cheapest substance is a jelly made from pea-meal boiled in hay tea, and mixed while warm with the warm milk. Linseed meal is also frequently used in place of the pea meal. The calves readily learn to drink the milk out of the pail; and if fed with great regularity and kept clean, they thrive fast. Great attention is necessary to see that they always get the milk while it is warm from the cow; as the same quantity of such milk will do them more good than half as much again cold or artificially warmed. Young cows and bad milkers, as also those I have mentioned as having an extra calf put to them, are allowed to suckle their calves, and are separated by partitions until the calves are able to take care of themselves, when they are allowed the freedom of the byre, their mothers remaining tied up. Generally the suckled calves are finer looking than those brought up by the hand, besides being much less trouble in bringing up. But still it would not do to let a large milker suckle a single calf; as when the cows get on the young grass, it brings on a flush of milk, and if the calf is not able to take it all, the udder thickens, and the cow becomes a worse milker, even if she do not contract some disease of the udder. I remember seeing one of the handsomest cows I ever saw sold to the butcher; as, on account of a thickened udder, she was unable to give a drop of milk. About the month of May they all go to the fields, the suckers with their mothers: those fed by the pail are put into a field or paddock near the house, where they continue to get their allowance of milk until harvest, when the milk is required for the extra hands employed at that busy season. Upon the best managed farms they get a bundle of tares or cut grass once or twice a day, immediately they are deprived of the milk. The tares are the best food for them; they are either given in the field, or any neighbouring shed.

The suckers are not generally taken from their mothers till they are housed for the winter, about the end of October or beginning of November. Any very late calf is allowed to suck even longer. The first winter they get two feeds of yellow turnips a day, one in the morning and another about mid-day; they get as much as they can eat clean up at each meal. After each feed of turnips they get a bundle of straw a-piece, and another larger bundle in the evening. A few farmers give them half-a-pound or a pound of oilcake each daily, but it is not general; although I think it would make them thrive better,

and is said to be a good preventive of quarter-ill. It may be mentioned as an objection to the use of cake, that the young beasts feel the want of it when turned out to grass in spring. The second winter they get the same keep, only the turnips and straw being proportioned to their increased powers of consumption. By this simple feeding the beasts are always in a thriving state; and, although of course not full fat, they are in such condition that it is an easy matter to push them forward for the butcher the following summer. It is a maxim among all farmers here never to let a beast fall back for want of sufficient food; but always to keep him as fat as possible, without going to great extra expense for food.

In the spring, as two-year-olds, they are put upon the new grass; and through the entire summer they have fulness of keep, being always kept on the best grass the farm affords. By the end of summer the heifers and the steers, which do not seem likely to return a good profit for the winter keep, are sold to the butcher. The others are housed before the grass fails, about the beginning of October. If the turnips are not ready for eating, they get grass, or tares, in the house. When on turnips, they get three full feeds every day, with three fodderings of straw, and from two to four pounds of oilcake at mid-day. Many farmers never use oilcake; but it tells both on the beast and in the manure. But I have seen as fine fat cattle as you would wish to see, three years old, which had never tasted anything but grass, turnips, and straw. The first fat are sold about Christmas, and the rest during spring; all being sold off by the time they are three years old.

The great secret of feeding cattle of any age successfully, consists in supplying them with their food regularly, and keeping them quiet, clean, and warm. To accomplish this they are fed and cleaned at stated hours; the cattleman performing all the necessary operations about them with quietness and despatch; and after giving them a good dry bed, to entice them to lie down and ruminate, they close the doors and leave them to repose, as nothing irritates a beast more than anybody working about him when feeding or lying. It is a good plan to make the cattleman clean the feeding cattle every day with a currycomb and brush, as, being tied up, they cannot easily lick themselves clean.

Oxen thus fed fetch at two-and-a-half or three years old from £18 to £24. At one of our local markets (Turriff) Saturday, January 7, six two-year-olds brought £18 a-piece; and a pair of older cattle £60 the pair. These, of course, were considered high prices; but it shows what can be done even with plain keep and good management.

I think the Aberdeenshire farmers owe somewhat

to the Aberdeen fleshers and Aberdeenshire cattle-dealers for the briskness of their markets, and their profitable returns for stock. These enterprising men attend all the local markets, and are always ready to give fair prices for good stock. They ship hundreds, aye, and thousands of cattle to London every year, where they cut so fine a figure at Smithfield, in the lots of Messrs. Morgan, Giblett, Guerrier, &c. I would also mention another thing, to which I think

they owe their success in this branch of farming, and that is, that they breed, rear, and feed their cattle themselves; thus keeping in their own hands the profits of the breeder and cattle-dealer.

I will now draw my remarks to a close, having, I think, stated the most important points of our system, which I hope may be of interest to some, and use to others.

G. B. BLANC.

Aberdeenshire, Jan. 9.

HOWDEN FARMERS' CLUB.

REPORT ON THE MERITS OF WOOD AND IRON PLOUGHS.

In the usual occurrence of seasons, after the conclusion of harvest operations the general practice with farmers is to commence ploughing, in order that the land, being turned over in a dry state, may be ameliorated by the action of the winter's frosts. Without further comment upon the many and very necessary cases that the plough must be brought into use in the subsequent seasons which elapse prior to the husbandman reaping the advantages of his labours, we shall endeavour to describe the action of ploughing as simply as possible.

It is well understood that the plough serves the same purpose to the farmer as the spade to the gardener; and the object to be gained from their use is to obtain such a command over the soil that, as previously stated, it may become ameliorated, or friable.

The spade, we all know, is an implement entirely under man's personal control; though means have been devised to wield it by the application of horse power, but no locomotive machine can compete with the human body in executing work within the sphere of its strength and dexterity. The plough is certainly the nearest approach we have yet made in obtaining a substitute for spade labour: being too heavy an implement for manual use, it is not therefore so entirely under man's control; but, by the use of horses, with approximate appliances, known as gearing or harness, he can command its motions pretty effectively. The quantity of produce is usually larger when manual labour solely has been resorted to; but the comparative cheapness of the cost, combined with the fact that, within a given season, a much larger breadth of soil is under the farmer's command by the use of the plough, the deficiency is amply compensated for.

Spade husbandry, to the casual observer, seems both a simple and easy operation; but experience proves that the act of digging is the reverse, as it requires every muscle of the body to be put into action, so that any machine to imitate it must have a very complex structure. And it is a difficult problem in practical mechanics to construct a light, strong, durable, and convenient instrument, of easy movement, which will produce by a simple action the desired effect; yet we have in the plough an implement possessing all these properties in an eminent degree.

Various have been, and still are, the opinions, whether this valuable implement should be made of wood and iron, or totally of the latter material. From Northumberland to Aberdeen, in many parts of Lincolnshire, and some of the southern counties, wood is the exception—in this neighbourhood the reverse. Of late years a few of our leading agriculturists have endeavoured

to supersede it by the use of iron; but the prejudice of the labourer in too many instances has triumphed over the employer, and the intruder allowed to be cast aside, only to be used when no other was to be had. A wooden plough seems to the unpractised hand a clumsier implement than an iron one; but in weight it is lighter. This, we suspect, to be the true reason of its popularity.

The recent advance in the value of manual labour and horse power, renders it highly important that these two principal outgoings of the farmer should be economised. Large sums, for many years, have been wasted, partly from the supineness of the agricultural class to deviate from the systems laid down by their ancestors, and partly from the want of means to calculate with accuracy the great saving to be effected by carrying out some of the more modern views of the present race of the occupiers of the soil. To overcome the prejudices of the former, we are indebted to our agricultural societies and farmers' clubs; to obtain the latter, to scientific men, who have spared neither pains nor expense to effect so desirable an object; and, particularly in this report, we must make honourable mention of Mr. Bentall, of Uxbridge, the patentee of the improved dynamometer, who, in the most handsome manner, not only lent us the use of the implement, but personally superintended the testing of the relative draught of the ploughs, thus enabling us to arrive at a conclusion not only most satisfactory to ourselves, but we trust to the agricultural community generally, as regards the most difficult part of the test—draught. This, with the other points which we consider it our duty to lay before you for discussion this day, viz.: durability, relative cost, weight, and performance, we will now go into *seriatim*; merely observing, that the trial which we were called upon to give our opinion, took place at Messrs. Wells' Booth Ferry farm, in the month of October last, and was arranged by Robert Scholfield, Esq., of Sand Hall, and Mr. John Wells, of Booth Ferry House, for the express purpose of arriving at an accurate decision on these points, the former gentleman having hitherto used the wooden plough, the latter having superseded it by the iron one. The land chosen for the work was wheat stubble, the quality deep old warp, the depth of the furrow to be ploughed eight inches, and the width twelve inches. The competing ploughs seven in number; four composed solely of iron, and three of wood for the haies and beams, the remaining parts wood sheeted with iron. All the ploughs to be drawn by the same pair of horses, but each plough to be held by the person accustomed to use it. The result was as follows:—

	Weight of Im-plement.		DRAUGHT.		Relative cubic inches per 100 feet.
	st.	lb.			
IRON PLOUGHS.					
1. Mr. Wells, Booth Ferry, own manufacture	17	0 100	33 ³ / ₄	100	37 ³ / ₄
3. Ditto, ditto, Fifeshire ditto	13	7 105	33 ¹ / ₂	100	31 ¹ / ₂
4. Mr. H. Smith, Drax Abbey, Busby, maker	17	11 106	29 ² / ₈	100	28 ¹ / ₂
7. Ditto, do., do. with wheels	20	13 101 ¹ / ₂	32	100	31 ¹ / ₂
WOOD PLOUGHS.					
2. Mr. George Clark, Howden, Prince, maker	12	0 95	36 ¹ / ₂	100	38 ¹ / ₂
5. W. Scholfield, Esq., Sand Hall, Foster, maker	11	13 100	35	100	36
6. Mr. W. Smith, Potter Grange	11	4 97	39 ¹ / ₂	100	31

In making the average one hundred cubic inches for each plough, we have calculated at the same rate those whose furrows were below, as those that were above one hundred cubic inches. This is in favour of Nos. 2 and 6 ploughs, they having averaged below one hundred cubic inches; and adversely in proportion to Nos. 3 and 4, whose average exceeded one hundred cubic inches. The additional land ploughed by the latter, caused a greater draught in proportion than the calculation gives; it is therefore evident that the iron ploughs, 3, 4, 7, have the superiority in lightness of draught over all that were tested. No. 6, wood plough over No. 1, iron; and Nos. 2 and 5, wood ploughs, notwithstanding the average weight of the wood ploughs was twenty-five per cent. less than all the iron ones, excepting Mr. Wells' Fifeshire plough (No. 3)*.

Having laid before you the draught and weight of the competing ploughs, we proceed with our opinion upon one of the most important points of this description of agricultural work, namely, the laying of the land, and the turning of the furrow. In this respect, Mr. Wells' Fifeshire iron plough stands pre-eminent. Mr. George Clark's, No. 2, and Mr. William Smith's, No. 6, wooden ploughs, the next in order.

It now only remains to state what we conceive to be the cheapest and most durable implement. The cost of a wooden plough, when new, is about three pounds, capable of being serviceable, with repairs, for a lease of five years, at one pound per annum. An iron plough, four pounds ten shillings, capable of being serviceable, with repairs, for a lease of twenty years, at eight shillings per annum; and half the prime cost for the wrought iron parts, such as hales, beams, and shackles.

Thus we have—	£	s.	d.
Wood, prime cost	3	0	0
Repairs, five years	5	0	0
	8	0	0
Deduct old iron coultter, shackles, and shares	15	0	
Total for five years	7	5	0
	£	s.	d.
Iron, prime cost	4	10	0
Repairs, twenty years	8	0	0
	12	10	0
Deduct old iron	2	5	0
	10	5	0
Add interest on difference	4	6	
Total for twenty years	10	9	6

* See tabular statement.

The average expense of a wooden plough, therefore, will be £1 9s., an iron plough 10s. 6d. per annum, or a saving of nearly two hundred per cent. in favour of the latter.

In making this calculation, we thought it better to fix a terminable date to the iron plough. Mr. Wells showed us ploughs that have already been regularly used for upwards of ten years, and they appear, in their skeleton parts, nearly as good as new. The vicissitudes of the weather, to which this description of farming implement is necessarily exposed for nine months in the year, operates powerfully upon the beams and hales of wooden ploughs; whilst its competitor, with a single coat of red lead annually, escapes comparatively scatheless.

You are now in possession of the result of a competition which, to our minds, clearly demonstrates that, in lightness of draught, the wooden plough can bear no comparison to the iron one, whilst in every other respect, especially as regards economy, the latter supersedes it.

We trust that the kindness of the gentlemen who originated and subsequently brought to a conclusion this practical test will be duly appreciated; as experiments on controverted points thus carried out by its members must tend to the advancement of the Howden Farmers' Club in the opinion of the country, as beneficial to agricultural pursuits.

SAMUEL STORR.

WILLIAM THOMPSON.

THE CLOVER FAILURE.

SIR,—Although the cause of failure in clover, when sown at short intervals on the same land, is a subject on which public opinion is by no means unanimous, the fact itself is well established, and one which I fully admit. My object, however, in this communication is to endeavour to show that the frequent disappointments we meet with in this plant are not nearly all attributable to over-cropping. The universality of belief that clover will not succeed if sown too frequently, deters farmers from willingly risking such a loss as the failure of that crop incurs. Hence we see great caution practised in this respect. Still we experience failures, and that, perhaps, where we least expected them.

For instance, two years ago I had a field of twenty acres which was a full plant, and looked very promising till about February, when it began to die; and continued doing so till nearly the end of May, by which time there was not more than one-fourth of the original number of plants left. This field had not been clover for ten years previously. Another field is now going off in precisely the same manner, which has not been in red clover for twelve years, but has borne a mixture of white clover and trefoil once in the interval. In the former case the entire field was cut for hay; and although necessarily very thin, yet the plants that remained were strong, and the produce far beyond expectation. After this it branched out surprisingly, and grew most vigorously; so that from one part of the field used for soiling two more good cuts were obtained, and the other part produced a fair crop of seed.

In the other instance referred to, the plant at harvest was excellent; in fact, so luxuriant was it, that, in six weeks after the barley crop was removed, a good cut of clover might have been obtained, but it was fed down with sheep.

Were this an isolated case, there might be much reason in ascribing the present decay to weakness resulting from this autumn luxuriance. It is, however, a circumstance of every year occurrence to a greater or less extent; and numerous cases of a similar character might be adduced if necessary, but those already specified are sufficient, I think, to shew that the

failure does not arise, in these instances, from the land being tired of clover—first, because there was a sufficient interval between the crops for recruiting from natural sources those elements necessary for its production; and secondly, because such vigorous growth could not have taken place where the essential constituents of the plant did not exist.

From these circumstances, as well as from all the observations I have made, it is the firm conviction of my mind that the loss of this plant is generally attributable to the ravages of an insect, very similar in its habits to the wire-worm. This view is strengthened by the well-known fact (referred to by some of the members of the Croydon club) that it will frequently stand good on the headlands and firmer places, when

it fails in other parts—just as we frequently see a field of wheat or oats good in those places consolidated by treading, or otherwise; while the rest is destroyed by the wire-worm. If any one will take the trouble to examine a dying plant of clover, it will be found to be nearly severed, apparently by an insect, just beneath the surface of the ground; while the root below is perfectly sound. The failure of the lighter portions of the field I attribute to the facility of transition thereby afforded to the depredator.

Hoping that some means of destroying this enemy of the farmer will speedily be devised,

I am, sir, yours respectfully,

Feb. 17.

T. M.

R U S S I A .

So much is now being said of the empire of Russia, that a general view of her civil and military resources may not be unexceptionable; the more so, we believe, because of the many extravagant ideas entertained as to her aggressive power in the extremely conflicting state which the Eastern question has at length assumed.

The Russians themselves entertain—like the generality of nations in a similar state of civilization—the most absurd notions imaginable as to the power of their Government; and therefore it is not surprising that they have laboured themselves into the belief that the united kingdoms of western Europe are unable successfully to oppose the ambitious designs of the Emperor Nicholas, more especially as the conquest of Turkey at the present period forms part of their religious creed; but a moment's reflection must convince the greatest truckler to the northern despot that this is not exactly the position things are in. What would Napoleon I., for instance, have said had any one told him that he must enlist the services of England before he attempts to invade Russia? Has not France kept pace with Russia in the progress of naval and military affairs?

Area.—Russia, as our readers are aware, is situated partly in Europe, partly in Asia, and partly in America. The European division comprises about 1,700,000 square miles, the Asiatic 4,400,000, and the American 400,000; total, six and a-half millions of square miles, or 4,160,000,000 acres! With the exception of the Ural and Caucasian chains of mountains, this almost unbounded territory is one extensive plain, gently undulating in certain places, and interspersed with numerous swamps, steppes, and forests, some of the latter being larger than the whole of the United Kingdom.

Population.—About 60,500,000 inhabitants only (?) are thinly scattered over this immense territory. With the exception of St. Petersburg, Moscow, and Odessa, there are scarcely any towns above the size of an ordinary village. The inhabitants of every place deserving of the name of town would not, probably, amount to much more in number than are contained in the English capital; so that the vast majority of the whole are thinly dispersed over the most inhospitable regions of the globe, engaged in agriculture, hunting and fishing.

The European division is the most densely inhabited of the three, there being only in Asia and America about one inhabitant to every square mile, as the following tabular statement of the area and population will show, viz.—

	Square Miles.	Population.
Russia in Europe	1,700,000	56,000,000
Russia in Asia	4,400,000	4,000,000
Russia in America	400,000	500,000
	<u>6,500,000</u>	<u>60,500,000*</u>

Race.—The inhabitants have been divided into two races, the Caucasian and Mongul; but, of the whole, the latter do not comprehend one-hundredth part. The former is sub-divided into Slavonians, Fins, Tartars, Germans, Jews, and Greeks. Of these, the Slavonian race comprises nine-tenths of the whole population of the empire, and is farther sub-divided into Russians, Poles, Lithuanians, Lettes, Wallachians, and Servians. The Russians are estimated at about 40,000,000, and inhabit principally the middle portion of the empire, or that comprised between the Volga and Dnieper, and hence include the far-famed Cossacks of the Don. The Poles inhabit the provinces of their own name; the Lithuanians the governments of Wilna and Minsk; the Lettes, Courland and Livonia; while Bessarabia is inhabited by Wallachians and a few Servians who dwell among them; the Tshudes, or Fins, inhabit Finland, Esthonia, Lapland, Livonia, and the middle banks of the Volga.

The Tartar race inhabits the Crimea, northern declivities of the Caucasus, and both sides of the Ural mountains. The Teutonic and Hebrew families are interspersed throughout the whole. Germans are numerous in the Baltic provinces; Swedes on the Gulfs of Finland and Bothnia. In the governments of Wilna, Grodno, Volhynia, and Podolia the inhabitants of many towns are nearly all Jews; while the Greeks are more numerous in the southern provinces. The south-eastern steppes of Russia are inhabited by Calmaucks, who, like many of the Tartar race, are nomadic. In Siberia there

* The above is from the "National Cyclopædia" (1850) The "Popular" (1841) gives the area 8,060,000 square miles; and the "Britannica" (1842) 7,000,000.

are about forty distinct tribes, differing in language and physical character, partly belonging to the Caucasian, and partly to the Mongul families. Circassia is inhabited by from twelve to twenty tribes, who are independent of each other, and number about half a million. The inhabitants of Georgia consist of "Georgians, Armenians, Greeks, Koords, Turks, Jews, and Gipsies;" and in number are under one million and a half, including Mingrelia, and a few other principalities only partially under the sway of Russia. Such are the hordes of the Czar and their habitations generally speaking. They are, however, becoming annually more and more blended together; and, doubtless, will ultimately become one great people, unless the tyranny of their ambitious and unprincipled ruler compel them to revolt, dividing themselves into several separate and independent states before the work of amalgamation is thoroughly accomplished.

Language.—When the inhabitants of Russia consist of such a number of conquered and half-conquered tribes thinly scattered over so large a portion of the globe, there must of necessity be many languages. The Muscovite dialect of the central part is fast establishing itself throughout the empire; but the Poles, and several other races, are induced to cling to their native tongues with many associations of freedom from an arbitrary yoke. Improvement has made considerable progress since Peter the Great; and, but for the despotism of both state and church, would have been much farther advanced. The language is more pleasant to the ear than the eye of an Englishman, owing to the number of consonants used as suffixes and prefixes; the letters S, Z, V, and W, for instance, giving to verbs different significations.

Religion.—The Russian church is a branch of the eastern or Greek church, of which the Czar is the head. Its affairs are administered by the "most holy governing synod," composed of ecclesiastical and lay members. It contains forty dioceses divided into three classes, four of which are governed by metropolitans, sixteen by archbishops, and the remaining twenty by bishops. The sons of the clergy are obliged to follow the profession of their parents: thus literally reducing it to "*priest-craft*."

There are numerous dissenters from the established church, termed "*Raskolniks*," or schismatics, occasioned by an improved translation of the scriptures at an early period of its history. But there appears now to be other causes, for dissenters divide themselves into two classes—those having priests, and those having none; the former termed *Popovshcheena*, and the latter *Bespopovshcheena*. Each class is subdivided into different sects, those having no priests being the most numerous.

In many parts of the empire idolatry still prevails. The Calmucks, for instance, are Buddhists, and were subject to the ecclesiastical authority of the Dalai Lama of Thibet, until the emperor Paul, in 1800, induced them to choose their own great lama, to whom all the other lamas and priests are now subject.

Government.—The administration of the empire is

of the most despotic kind. In the language of the "National Cyclopaedia," "*the Emperor of Russia is as absolute as in the times of Jean Vasilovitch the Terrible.*" Any privileges enjoyed are entirely at his mercy, who gives and takes as he thinks proper, and generally rank is confined to civil and military office. The inhabitants are divided into five classes or castes—clergy, nobility, merchants, burghers, and peasants. The clergy are either monastic or secular, and are too often little more than state machinery in the hands of the Czar; who has assumed since the commencement of the Eastern question the imposing title of "*Emperor God!*" Formerly the nobility were virtually the rulers of the empire; but of late years their power has been greatly on the wane. There are three classes of merchants; the first and second of which are exempt from the capitation tax, military conscription, and corporal punishment. Burghers enjoy certain privileges by licence; but are subject to the above tax, conscription, and punishment, along with the peasants, with but few exceptions.

The Council of the Empire, presided over by the Emperor or his representative, is divided into four departments: 1, legislation; 2, naval and military; 3, civil and ecclesiastical; and 4, financial; each having a secretary. All decisions are submitted to the Emperor.

The "directing senate" is divided into eight departments. The first superintends the general affairs of the country; second, third, and fourth try civil cases; and fifth, criminal cases. These five are at St. Petersburg. The other three are at Moscow, where the sixth tries criminal cases; and the seventh and eighth try civil cases. These departments have their own respective provinces; each of which is ruled by a civil governor, vice-governor, procurator, court of appeal, tribunal of conscience, with public charitable and medical boards. Provinces are again divided into districts, each having a marshal and council of the nobles, a tribunal, and board of police magistrates; while towns have their separate jurisdictions, composed of burgomasters and ratmans (councilmen). Such is the state machinery with which the Emperor Nicholas governs nearly a sixth part of the habitable globe.

Agriculture.—Of late years Russia has been making considerable progress in agriculture—more, probably, than any other kingdom of the world; and when we view the many obstacles which stand in the way, no little praise is due to her farmers in this respect. She is still, however, far behind in this the parent of arts. The *modus operandi* must necessarily be very varied, owing to the diversity of climate: Over the principal portion of the empire its chief feature arises from the lands being covered during the long winter season with snow, their easy culture after the thaw, the rapid vegetation of summer, and the difficulty of harvesting crops from the shortness of the autumn, and the early period at which winter commences.

Soil.—"The soil of Russia is almost everywhere a soft black mould, of great depth," says Loudon, "and generally on a sandy bottom." There are, however, immense deserts of sand, swamps, and marshy grounds;

and, upon the whole, it is more diversified than in any other kingdom of Europe, owing to its situation and extent—in some parts sterile to a proverb, while in others inferior to none in point of fertility.

Climate and Produce.—In the more northern regions the inhabitants live on fish and the produce of the chase, the climate forbidding any other occupation save fishing and hunting. As we proceed southwards, towards the capital of the empire, barley, oats, and rye are grown; and wheat, with pulse crops, extensively after passing Moscow, and millet south of 55 degs. north latitude. From 48 degs. N., to the southern limit, Indian corn is grown. Flax and tobacco are also largely grown; the latter principally in the Ukraine, and the former over a large area of the empire. In many places the soil is well adapted for flax; while the short period required to grow it suits the climate equally well, and which, no doubt, accounts for the extent to which it is grown. The steppes yield in many places an abundance of pasture for large flocks and herds, such as the Calmucks and Tartars possess. North of 56 degs. fruit trees do not grow well; but in the southern provinces it is otherwise—peaches, apricots, quinces, mulberries, walnuts, almonds, pomegranates, and grapes being grown, with the usual root crops and garden vegetables kindred to such products.

Russia possesses immense forests of timber. One, in the northern portion of the empire, is said to extend over 150,000 square miles, principally pine. The oak forests of Casan, Nischni-Novgorod, Pensa, and Saratov, are valuable for ship-building, and have engaged the attention of Government on account of the navy. The central provinces have no more timber than they require, while some of the southern fall short of even that.

In the animal kingdom, horses, black cattle, sheep, and goats are reared in great numbers, and also pigs. Some of the nomadic hordes have large herds of camels. About Astrakhan there are a few buffalo herds, while the European bison exists in the forest of Bialoviza. In the northern forests there are elks, deer, hares, and wild hogs. North of sixty-six degrees the only domestic animals are the reindeer and the dog. Of wild animals killed for their skins, bears, gluttons, badgers, wolves, foxes, martens, polecats, weasels, ermines, otters, squirrels, and marmots may be mentioned. In the steppes of the south-east are wild asses in summer, and antelopes. All the European birds are found.

Gold, silver, and platinum are found in the Ural Mountains. Copper and iron are also found in abundance in the Ural, and other places. Siberia is rich in mineral wealth. Coals exist in a few places, but small in quantity. Salt is found in various lakes; and a salt formation extends along the western declivity of the Ural Mountains, to the source of the Kama, and thence westward on both sides of the Uwalli.

Roads, Railroads, Rivers, and Canals.—The country is miserable as to roads, but better accommodated as to water-carriage, from the numerous and large rivers of the Baltic, Black Sea, Azof, and Caspian being joined together by canals. From St. Petersburg to Astrakhan,

for instance, the length of canal, lake, and river carriage is 3,200 miles. The great drawback to conveyance on such arises from the severe frosts of winter. Between St. Petersburg and Moscow a railway was opened in 1850, and others are in progress; but the great barrier to their success is the thinness of the population.

Manufactures and Commerce.—A poor population, thinly scattered over a country like Russia, cannot be expected to make any appearance in the manufacturing and commercial world. At the same time, considerable progress has been made in both departments of late, more than could well have been expected under all the circumstances of the case, sufficient to prove that if her hardy sons enjoyed the same privileges and facilities as Englishmen do, they would not willingly linger far behind in the march of improvement. English manufactured goods are imported to a limited extent; in exchange for which the raw products of agriculture, forests, and fisheries are returned.

Military and Naval Affairs.—We mentioned the four departments of the Council of the Empire, one of which is the above; but made no observation whatever upon it. Russia is literally a nation of soldiers; every one able to “shoulder a gun,” the clergy excepted, belonging either to the army or navy. It is this, with her peculiar climate, which renders her formidable when acting on the defensive. When on the aggressive, however, the scattered position of her inhabitants, and the absence of roads and railroads, render it difficult to bring them to bear upon any given point; hence the advantages she has gained by the negotiations in the Eastern question—delay enabling her to bring up her troops to the Principalities. Both have made considerable progress, in a professional sense, during the last forty years, as if for the express purpose of conquering Turkey. The Black Sea fleet is formidable, many of the vessels being British-built, and a great part of the machinery of home-built steamers being also of English manufacture.

Such is a very cursory review of the immense Empire of Russia, scarcely yet more than half reclaimed, as it were, from the barbarous hordes of the north of Europe and Asia, and which contains more within itself to make a nation great than perhaps any other kingdom of the world, without any further additions.

CORNS IN HORSES' FEET.—A veterinary surgeon gives the following advice respecting corns in horses' feet:—“The corns should be regularly pared every three weeks, and then fill up with sealing-wax, melted into the cavity, he will soon find his horse better, and in time cured. I have tried the above twice, and am glad to say it answered.” Another practitioner states that “the most effectual remedy for corns in horses is, to cause the shoes to be made in such a manner as not to impinge upon the excrecence. By relieving the parts affected from continued pressure, the rigidity will relax, and ultimately diminish and decay. It may be as well to observe, that corns well saturated with oil of turpentine will yield with more facility under the above treatment.”

WHO OUGHT TO KEEP THE PAUPER POPULATION?

If the present age has a characteristic, it is certainly not inconsiderate haste, or any over-anxiety for "the despatch of business." We are prone rather to dwell over our ills, and to regard our difficulties from so many different points of view as to frequently prevent our in any way attacking them. Great indeed must be the blessings of *statu quo*; and many the dangers that will attend him who is sanguine enough to endeavour to improve upon them. Even if we do resolve on fronting the enemy, it must be to very slow time. The Augur who advised his master to "cut boldly" would find few now with confidence sufficient to follow his instructions.

We have been looking at one of our own social evils so long, considering its many difficulties in so many ways, and doing nothing beyond this, that we really hardly know how to appreciate his courage who at length volunteers for something more. If the Government, no matter of what variety of opinion it might happen to be composed—if the party in power did its duty to the country, one of its first acts should be some further improvement upon those laws which affect the condition of the working man. Let him be ever so well inclined, there were at present serious impediments to his doing justice to himself, or to fairly meeting that market there might be for his services. It was not only the workman who urged this; it was still more strongly put by his employer. Neither was satisfied with a condition which so closely circumscribed the field for labour, and that tended so much to the self-depreciation of those who had it to offer.

It might naturally be supposed that any one, who, acting on so unanimous an opinion, imposed upon himself the task of improving on this condition, would be tolerably certain of some hearty encouragement. The times, however, are out of joint for any such manifesto. We have taught ourselves, if anything, to magnify the obstacles in our way, and to ponder over them until they become almost invincible. A remedy is regarded with something more than suspicion, and thus perhaps after all—after all this complaint we have been reiterating year by year, it may be better on consideration "to bear the ills we have, than fly to others that we know not of."

The proposal of Mr. Baines for removing some of the ill consequences attributable to the present law of settlement has been met occasionally in this spirit. We have been asked rather to keep our attention on the difficulties in the honourable gen-

tleman's path, than to the good that might follow the attainment of his object. At a meeting held at Northampton last week, the chairman, a country gentleman of high position, introduced the subject with some such a prologue. He was evidently full of doubts and fears, and ready enough to give Mr. Baines anything but hopes of success. Two or three other speakers were quite as willing to see the law of settlement rest just where it is. At last, however, it came to the practical man's turn; and he appeared quite as confident that such a state of things could *not* be suffered to remain as they are, and that Mr. Baines was most assuredly taking a grand step in the right direction. A very strong majority of the meeting was also clearly of this opinion; and so, after all, it was allowed that the effort was a very creditable one, despite the difficulties in the way of its success.

If we recollect aright, it was one of the local prints of this very county that but a week or two since did its best to prove this question purely a party one, by which the agriculturist would be once more the chief sufferer. If we wanted a contradiction to this, we need not go far for it. The proceedings at the meeting of the Northampton Farmers' Book Club will furnish the best commentary on such a statement.

It is the difficulties, however, in the way, rather than the effect which will follow the proper attainment of his object, that Mr. Baines has to fear. The chief of these, we are assured, is injustice. By a pamphlet* just issued, we learn that Union rating would be to many parishes a monstrous hardship. Imagine one that now pays its eightpence or ninepence in the pound being called on to equalize its average with some less fortunate neighbour, which is perhaps up to half as many shillings as the other is pence. Picture the air of injured innocence with which the former draws himself up, and "keeps himself to himself." Attend to the marked emphasis of that argument with which he indignantly announces that he has "no connection with any other establishment." It is not a question of profitable or unprofitable labour, as far as the employer is interested, or of fair play and opportunity as regards the labourer himself. Nothing of the kind. It is simply as to who shall

* Observations on the Government Bill for abolishing the removal of the poor, and re-distributing the burden of pauperage, with a proposal for more equitably re-distributing that burden. By Robert Pashley, one of her Majesty's Counsel. London: Longmans.

maintain the pauper. "Now, here, my dear sir, we have no paupers. This parish, as you see, has been very ably managed. We had, to be sure, some poor in times gone by; but they have been gradually got rid of. What labour we want we send for, and then send the machine back again. We are sure you will see what a monstrous injustice it would be to call on us to share the burdens of other people. You would injure our property, and quite destroy our character as a model parish." This is really the chief injustice of Mr. Pashley's pamphlet. Is there no injustice as it is, with one over-crowded district keeping the people another has had the use of? The man from one college did not like saving the member of another who was drowning, because he had not been introduced to him! Our model parish is proportionately particular. He cannot help the poor man of another hamlet. He really does not know him. If you please, he will keep himself to himself.

It is but fair to say that our author, who confines himself strictly to the pounds-shillings-and-pence view of the subject—the question as to who ought to keep the pauper population—is prepared with a remedy, which has at least the recommen-

dation of going a good deal further than Mr. Baines has ventured. It approaches, indeed, to something very like national rating, with the proviso that each parish should still have some interest in its own expenditure. The proposal is

"That, on the repeal of the law of settlement, the yearly sum needed for the relief of the poor be raised by parochial rates on all real property; that the amount in the pound levied in each parish should be at such a sum as to equal one-third of the parish rate needed to raise the relief bestowed in the parish, added to two-thirds of the average poor-rate of England and Wales. According to this plan, two-thirds of the sum expended yearly in relieving the poor, though raised parochially, would be raised equally throughout the whole country, and the remaining third of the expenditure of the whole country would be raised by each parish contributing one-third of its own actual expenditure."

We have no inclination to quarrel with this. It is more than likely that, if Mr. Baines's proposition were found to work well, it would gradually extend to something of the same broad basis. We must repeat, however, that this is not an age in which we are by any means too ready to jump at conclusions, or to appreciate the virtues of a *coup-de-main*.

FOOD FOR THE MILLION.

At a time when the price of everything in the daily bill of fare is so high, a few words on the domestic economy of our provinces may not be unacceptable. No doubt, few agricultural labourers are readers of newspapers, to benefit directly by any information advanced on their behalf through this channel. Such is their misfortune; but we hope that those who take an interest in their welfare (and who does not?), and who do read newspapers, will not overlook the very heavy responsibilities consequently devolving on that account upon them. When we reflect how much the prosperity of this country is dependent upon their toil; how much of that toil depends upon cottage economy as regards the daily necessities of life; how much of that economy, again, depends upon information far beyond their reach; and how the many circumstances of their situation chain them to customs not less at variance with their own happiness and prosperity, than the welfare of the community at large—what heart is it which does not blush at such a state of things, where the very bond of Christian society or fellowship is almost wanting? We never knew a case of ingratitude, among ploughmen, for the perusal of a newspaper containing anything bearing upon their own peculiar interest, or any favour which gave rise to more healthy rustication. Indeed, we have often thought that a newspaper gratuitously circulated among servants would be the best invested capital on the farm.

"What is good for the man may not be bad for the

master." A moment's reflection is enough to convince any one that the spirit of revolution now abroad in our provinces is not to be kept out-of-doors by "lock and key;" for we are to have "revolution and progression" indoors also. It is impossible to avoid it any longer; for our whole domestic economy is subject to reformation, as much in the kitchen of the farmer as in the cottage of the labourer.

"Science and practice" must be the motto of indoors as well as out. It has never been a very pleasant or popular concern, it is true, to call in question the economical policy of household affairs, or in any manner to provoke what have been facetiously termed "curtain lectures;" but revolution is something of an extraordinary character, and therefore the question must be honestly put, and fairly answered, "*Is the pudding right?*"

In agriculture, prejudice has been experienced the greatest barrier to progress; and in cookery, this enemy of our "caste" will be found to exercise tenfold authority. When we look abroad upon the nations of the world, and contemplate the anomalous variety of productions comprised in the daily bill of fare, are we not forced to exclaim, *What a laboratory is the stomach of man!* But we may confine ourselves within a narrower circle than the circumference of the globe, to prove how far practice has been led astray from the path of science in the economy of human food; for every rural fireside will be sufficient to do so.

Nay, let each but ask himself how far prejudice, and a vitiated taste and stomach, through long usage, have to do in the selection and cooking of food, and how far science, and it will be found that the latter has little or nothing to do in the matter; for taste, in the vast majority of cases, is regulated by custom, and custom by prejudices as anomalous as they are antiquated and out of date.

We are all familiar with the many blessings associated with these words—"a thrifty woman." But what does a thrifty woman mean? Define it.

A thrifty woman, we should say, is one who "thinks twice before she acts once," one who brings what stock of science she has to bear upon her practice, or rather, whose practice is regulated by her science, and who embraces every opportunity to increase her knowledge of domestic affairs, being never too wise to learn or perfect to improve. In short, she is indeed the help-mate of man, performing her task cheerfully, with a mind as active and useful as her hands.

It is the misfortune of our rural districts that cooks have so few opportunities of acquiring information, and that the pliability of their natures to preserve the harmony of the family circle is directed into the opposite channel, so to speak, by the prejudices of those who "lord it over them." Let a man, for instance, be ever so perverse in his taste and mode of living, his wife will acquire a second nature, as it were, to please him—aye, and insist upon it, too, should any one venture to call his conduct in question, that he was right, and bring up his children accordingly. Farmers' daughters are occasionally sent to learn cooking of some professional cook, it is true; but, in nine cases out of ten, unfortunately on a scale altogether unsuited for their fathers' kitchens, or their own, when they get them—a scale by far too extravagant even for party dinners about Christmas and such occasions; while a few of the daughters of agricultural labourers learn the old routine of antiquated times in the farmers' kitchen, which they can never prudently and economically carry out in their own, but which they unfortunately often attempt to do. Now while we would most carefully avoid undervaluing the information acquired in both these cases, the minds of parties being greatly enlarged, yet such is not enough nor exactly the kind of tuition which either requires, for both want something of a more scientific and experimental kind at home. "Far-fetched fowls have fair feathers," it is said: nevertheless, foreign theories do not always correspond with home practices, more especially the nostrums of cooks—a class no more than sufficiently informed in the principles of their profession, generally speaking. What is obviously wanted is science and practice at home. In other words, we must examine a little more closely our list of those edibles within our reach, and endeavour to turn them to better advantage, laying aside all the prejudices of the past, and beginning to build upon a new and solid foundation experiment in accordance with science.

"Don't like it." It is more easy to conceive the force of the argument than to express it. A wealthy

baker once sent his son to learn farming; but young tyro brought up in a large city could not eat ducks' eggs! "Why?" "Once saw a duck eat something!" "What?" (Very reluctantly), "*A frog!*" He had never to his knowledge tasted a duck's egg in his life, but was sure he would not like it, in consequence of ducks eating frogs! and for that simple reason could not be prevailed upon to break the ice during the whole period of his apprenticeship. Very many Scotch farmers cannot eat pork. When residing in the north we helped an old respectable farmer to a very nice bit one day at dinner, who mistook it for Southdown mutton, then being introduced into the district, and who relishing it so well sent for another "small plate!" This we refused, telling him the true bill, and expressing our fears lest harm should be incurred; but the ice was broken, and he, "a heal-healthy man," got his own way to make "a fair experiment," as he said; and to this day he feeds and kills his own pig. Now here was a very intelligent man, on the borders of 70, who had never tasted pork up to that day, he and his family sustaining a very serious loss because he "didn't like it!" In 1847 we endeavoured to induce a large staff of labourers in the employment of a nobleman in Huntingdonshire, to use oat, Indian corn, pea, and bean-meal puddings, but in vain. All the examples quoted were easily disposed of by them, on the plea of "don't like it," save the feeding of their children. "The Doctor" in the village, or rather market-town, in which the most of them resided, gave his children oatmeal pudding or porridge twice a day, and they were the healthiest in the parish—a fact which had led many of them to conclude, and not unfrequently they confessed, that such would do well with their own, if they could only get milk. The moment we reverted to their families, they at once seemed as anxious as we to entertain the question practically, and on learning our experience in the northern provinces, lamented their own position exceedingly. Skimmed milk, however, what they anticipated the greatest barrier, could easily be had on terms to meet the circumstances of almost every family, were there once a demand for it. Even where families have cows, skimmed milk is the only thing they have to their pudding, and a pennyworth will serve each for one occasion, if the family is not all the larger. We have seen large families not have more daily; indeed, it is seldom that they have, even in the months of summer, where each has a cow, any balance being made into cheese. It was different, however, with the youngsters themselves when of any age; for some very small boys and girls, whom we allowed to join their mothers in gathering stones, weeds, &c., expressed the prejudices of older people without qualification. It is lamentable to think of the tender age at which prejudice is warped into the minds of our peasantry by those whose duty it is to divest them of everything of the kind.

Great caution, it must be observed, however, is necessary in changing the food of hard-working people. An agricultural labourer exposed to the weather, for example, must of necessity consume a large

quantity of food; consequently the stomach becomes distended, and the whole system, in short, naturalized to it. If a change, therefore, is made to a less or greater nourishing species of food, his stomach at first must have the old measure to satisfy it, so that in the former case a want of strength is very soon felt, while in the latter a surfeit and its consequences are experienced. We have known many families ruin their constitutions by incautions changes from a vegetable diet to one of animal food, and *vice versa*, although there is much less risk in the latter case than the former; still a certain degree of caution is prudent, beginning by degrees being necessary to secure success, especially in the case of weak stomachs. We know a foreman in a large upholstery in this great metropolis, who uses oatmeal pudding generally twice a day, along with his family, in preference to any other thing. When he commenced, he was sent north by his employer to superintend the furnishing of a large establishment, and where he employed a good many additional hands belonging to the neighbourhood, who used porridge at breakfast. Being free from prejudice, and convinced of the superiority of porridge to anything he could get, as tea, coffee, and cocoa did no more than agree with his stomach, he required little inducement to give it a trial. It was *queer stuff* at first however, and he once thought it would never agree with him; but a few days resulted in the contrary, and he now thanks the good luck which sent him so far north as to learn what was good for himself, and tenfold better for a young rising family, whose ruddy cheeks betray what they have for breakfast and supper—a source of comfort and happiness to his leisure hours which we shall not attempt to value.

We by no means, however, approve of the exclusive use of oatmeal, and oatmeal alone. According to the cookery of the north, "porridge," *alias* "crowdy," *alias* "stirabout," is neither more nor less than an oatmeal pudding. Now, a pudding made of three elements only—flour, water, and salt, or flour, milk, and salt—always appeared, and does appear, to us cooking in all its patriarchal simplicity. Although we do not approve of the ninety-and-nine extravagancies to be met with in cookery books, we are willing to concede that something more than the above might be admissible now that the East and West Indies have both been discovered, with all their unbounded *et ceteras* naturalized and imported. In short, progress within doors is just as much wanted in the north as in the south.

In cooking, it may be laid down as an axiom, that what is best for man will, or rather ought to be, best relished by him, and that the many exceptions which may be taken to it arise from a vitiated taste and stomach—the result of bad habits and hereditary imperfections. But, simple as such a rule may be in theory, it is no easy matter to reduce it to practice, owing to the influence of season, and the vast variety of edibles now constituting the food of the British people. But with all the difficulties which surround us in this respect, it is obviously our bounden duty to train up our rising generation—that portion of society which holds out the greatest prospect of success-

ful tuition, especially among the lower classes—to cook and use that description of food which is best for them. Different employments may require different kinds of food. That required by the ploughman, for instance, will require to be different from that of persons of sedentary habits, both as to quantity and quality, granting that both stand upon a footing of equality as to incomes; while capital must always exercise its own influence in procuring more or less of the productions of foreign agriculture. At the same time there ought unquestionably to be but little difference in the food of children, whatever may be their rank. That England is capable of rearing as good children within herself as any other kingdom of the world, is susceptible of easy proof. At present it is rather an anomalous circumstance to find children in the upper ranks of society brought up on plainer fare than the majority in middle life; while if our labouring population could only get their own desires, half their children would be laid in a premature grave.

The formal rules of theory, it must be observed, however, have always been experienced a barrier to progress in practice, owing to their imperfection. Were it possible, in cases of this kind, to lay down strictly scientific rules, no such barrier would be found. Could such be achieved, we say, and could we adhere to such rules afterwards throughout the subsequent period of life, it would be a triumph indeed over fallen humanity; but as nothing of the kind can be expected, owing to the shortcomings of the human mind, in other words, as "there is not perfection in man," he must consequently learn to progress in science as he progresses in practice, the former always keeping in advance of the latter in accordance with the good old maxim "*think before you speak*;" hence the absurdity of stationary rules or recipes.

Nowhere is the evil of which we complain more severely experienced as a barrier to progress than in cookery—the formal recipes enunciated to the world by professional cookery books, so to speak, more especially cookery for the cottage of the poor man, being such as to prevent him from even attempting to reduce them to practice, owing to their extravagance on the one hand, and the absence of a proper knowledge of his circumstances, on the other, which they involve, not alluding to their unscientific character. They are even beyond the reach of the majority of farmers not more on account of expense than the impossibility of getting many of the articles which they enumerate as essential elements, and without which no provision is made; hence the standstill predicament in which they place the non-professional cook. In short, they just take it for granted that country people live half-way between Mincing-lane and Covent-garden! In other words, they appear to have been got up under the belief that everything they enumerate can be had in the country, and that the peculiar wants of country people harmonise with, it may be, the peculiar taste of their authors, or the epicurean notions of professional cooks generally, which in practice is a very serious oversight; for, although everything in Covent-garden comes from the country, and a

fair share of everything in Mincing-lane goes to the country, yet these are the productions of different climates and provinces, while every province of Britain has its own peculiar animal and vegetable productions as food for its inhabitants, and while the inhabitants themselves have almost as many tastes as the kingdom provinces; hence the upshot.

The practical question of progress is, for cooks to learn to cook better than they have done. We are not here to be understood as finding fault with what has been done, *but with the notion of having already attained to perfection*—the unfortunate position in which more than rural cooks are to be found. Every farmer should, in the first place, see that the produce of his own farm and garden is turned to the best advantage; and, in the second, that as many of the productions of foreign agriculture be added as prudence and economy recommend, studying to carry out the principles of cookery rather than its formal recipes, all of which being less or more imperfect, and none of them probably adapted for his own peculiar case; and his servants and cottagers should follow his example, making the necessary alterations to meet their own circumstances individually.

The raw products of food grown by ourselves, or of home growth for cooking, will depend not more upon geological and meteorological circumstances, than those of an industrial and political character. A farmer, for instance, may have a large stock of corn on hand, and also cattle, with plenty of keep, the produce of last year. He may also have a large, well-sheltered, early, and fertile garden, capable of yielding an abundance of vegetables for his table; besides whole fields well adapted for early peas, cabbages, potatoes, &c., for supplying the demand of towns and villages in his neighbourhood, or for forwarding to metropolitan towns by railway. He may have all these; but the grand question yet remains to be answered—Does he turn them to the best advantage? Not satisfied with the present prices, he may, on the one hand, for example, hoard up his corn to another season, during which time a large amount of damage may be done by rats, mice, weevil, and other vermin, besides mildew and the natural decomposition to which it is subject in the probationary climate of Britain; while, on the other hand, he may neglect to procure from his fields and garden that amount of vegetable food which they are capable of yielding—so that, between the two, it is more easy to conceive the position of his family than express it, or the domestic circumstances of the country, if we could possibly suppose stackyards, fields, and gardens thus managed generally. Again, the food-consuming population of our provinces are the labouring classes, some of whom have gardens; but, unfortunately, a large number are oppositely situated. We should say, however, that the majority have either gardens, or the privilege of planting a few potatoes, or the like, in the field; so that the amount of vegetable food to be derived from this source prior to another harvest will depend upon the area of land which they have, and the use which they make of it.

Nor are the raw products of food, the produce of 1854, capable of being brought to bear upon the short supply of the preceding year, confined to the vegetable kingdom only; for a large supply may also be obtained from our fisheries, dairies, poultry-yards, and piggeries, if properly managed; to say nothing of rabbits, hares, and game. In short, our domestic economy comprises both the animal and vegetable kingdoms; and the supply of both from crop 1854 may greatly modify the deficiency of that of the past year, if economically farmed.

To what extent a supply of food may be obtained from those sources is a question which cannot satisfactorily be answered; but it may safely be affirmed, that if a liberal allowance of garden ground, or plots for growing vegetables, were given, and our fisheries and other resources of animal food properly farmed, a very large addition to the defective supply of last year would be obtained; for no one can estimate the quantity of food which an industrious and intelligent labourer procures from his garden but himself, or the loss which he sustains in the absence of such an appendage to his cottage. For some months before harvest, for instance, it is a daily source of supply to him, yielding little short of half the consumption of his family, and might even be made to go further with improved management. How many families are there at present on a short allowance of food, so much so as to be unable to perform their work! but who would be otherwise circumstanced had they well-attached gardens, piggeries, and poultry yards.

We might very profitably "take a leaf out of our neighbours' book," as regards the produce and domestic economy of their gardens and small farms, for the peasantry of France have long been justly celebrated for the judicious and frugal manner in which they grow and use vegetables. In this respect it has truly been said, without hyperbole, that "a Frenchman will luxuriate where an Englishman would starve;" for the far-famed "*potages*" of the former present a singular contrast to the dry crust, cheese, and "sloppy tea" of the latter—sufficient to prove this, charting out in the plainest manner the course in which our cottage economy has to move.

Cottage cookery can never consistently, therefore, be separated from cottage gardening; and the propitiousness of the season, so far as gone, augurs favourably for the narrowed and pinching circumstances of the former being to a certain extent alleviated naturally by the superabundant results of the latter, if embraced by us. In other words, an early and abundant crop of garden vegetables would do much to relieve the wants of many a poor man's cottage, and therefore we cannot urge too earnestly upon the attention of our readers the propriety of co-operating with a season so providentially suited to our wants—forcing forwards by a liberal supply of manure of the proper kind, where wanted, with shelter, &c., a succession of garden crops for summer consumption, both in fields and gardens. Ground for early peas, potatoes, and other vegetables, where a labourer had not a garden, would be of greater value to him than any advance of

wages which he could possibly expect. In France a laudable example in forcing forward an early supply of vegetables will doubtless be shown us, in every province of that great Empire, save where the extremes of poverty cramp the operations of her peasantry. By the end of April, for instance, they will be in some measure pendent of the shortcomings of crop 1853; and why should it be otherwise with Englishmen? In every province how many naked fallow-fields are there, a corner of which might well grow vegetables for the labourers, and be in good time for wheat-sowing, and in better condition, we venture to say, than they otherwise will?

What is true of cottage cookery and the produce of the garden, is equally so of dairy produce—poultry, eggs, fish, and home-fed pork. Every cottage ought to have its pig and a few poultry, to consume its offal and supply pork and eggs for family use. If adjoining the coast, fresh fish will always enter more or less into the bill of fare; and if inland, few things are more thrifty in a cottage than a barrel of herrings, or cured fish of some kind or other, according to price. Every cottage, again, ought to have so much milk regularly every day, be it new or only skimmed; for this is neither more nor less than the inalienable right of the agricultural labourer to partake of the fruits of his toil. The maxim of "money for all" (wages in money) we fully appreciate; but this does not in the slightest degree interfere with the privileges of the cottage; for, although its occupant does receive payment in cash, he yet retains his right to receive of the produce of the farm, such as milk, wheat, potatoes, &c., at market price, which, if complied with, would be of considerable advantage to him, and also to his master, if supplies of this kind were properly controlled. The consumption of the farmer and his labourers, for example, is something of a uniform character, each requiring so much daily, weekly, monthly, or yearly; so that parties have only to arrange among themselves, making a proportionate division so as to leave the former the gainer by the expense of marketing the consumption of the latter—a saving by no means unimportant in a national sense, when we take into consideration the fact that the total consumption of our labourers cannot be estimated at less than £20,000,000 annually. For the individual item of milk, the labourer could always afford to give his employer more than he could make of it in cheese or pork: in other words, milk, whether new or skimmed, can be more economically used in its natural form for food than in the shape of cheese or pork. Skimmed milk alone, without any other element of food, is no doubt defective of carbonaceous matter for respiration, but along with the cellulose sugar and starch of vegetables is much more nourishing than it is generally admitted to be. In point of fact, there is a deep-rooted prejudice against it, in almost all our provinces, deserving of especial comment, arising partly from our beer-drinking habits, partly from the fact of its being given to pigs, and in no small degree from the imperfect and extravagant notions entertained of the nutritive qualities of the cream and butter.

It is an old saying, that "to put milk and beer in

one bottle is contrary to sound practice;" and, accordingly, we find few beer-drinkers large consumers of milk. Indeed, but few stomachs can digest both when used at one diet; and as beer is generally preferred to milk by those who can afford the requisite description of diet to suit it, and as farmers generally are able to do so, comparatively little of the latter is used in many provinces, while the contrary practice of bread, butter, and cheese, with ale, has been established; consequently, from a proneness on the part of servants to imitate their employers, skimmed milk has been undervalued as food. That milk is the natural food of man, requires no proof; and those who have reversed the natural order of things, would have had less to account for, had the hard-working labourer been placed in circumstances to comply with the artificial system thus established; but when he only gets the bread and cheese, and a short allowance even of them, they themselves consuming the butter and the beer, there is obviously sufficient grounds for a little wholesome inquiry. Without, however, formally entering into the details of such a question here, there cannot be a doubt but the domestic practices alluded to have been effected at a serious sacrifice of human food; and it will readily be granted that there is not a more suitable time for the discussion of such a sacrifice than one of scarcity as now experienced.

Negative or indirect examples, so to speak, are often as influential as positive or direct ones; and therefore the fact that this beverage is so frequently given to pigs and dogs is of itself sufficient to establish a world of prejudices against it, in the minds of an ignorant but high-minded peasantry, who think and talk more about their food perhaps than what they should do. Proud of the privileges they enjoy when contrasted with the serfdom of the continents of Europe and Asia, to which many of them have been eye-witnesses in the service of their country, and accustomed to associate with the liberties they thus enjoy, their "crust of bread and cheese," "rasher of bacon," "roast meat," "glass of ale, and pipe," as inseparable concomitants, we have always found them more disposed to look upon skimmed milk, oat, barley, Indian corn, rye, and pea meal, as the natural food of dogs, pigs, and poultry, than entertain seriously the question of cooking such for themselves.

Butter and cream, on the contrary, hold a very different position in the minds of our peasantry; for, "when the cream is taken off, the strength of the milk for a labouring man is gone," say they. The question, indeed, is a settled one in their minds; and were any one to tell them the contrary, they would at once look upon him as nothing more than a jester. The price of butter and cream, again, is of itself sufficient to prove their value as food to the satisfaction of any reasonable person." Such is the line of argument adopted by our peasantry generally speaking; and we need hardly repeat that it is considered conclusive in minds so unsophisticated as theirs are.

Such is the threefold chain of prejudices which has almost excluded from the tables of agricultural labourers the use of this beverage in a large number of our pro-

vinces. Our observations of course have only been directed to those provinces; and our readers who reside in the north of England, in Scotland, and in Ireland, or in the provinces where labourers have a daily supply from their employers, will readily appreciate our motives for having said so much on this subject here, since we have promised to return to its chemical value, cookery, and use in a subsequent article, while another class of readers may not. But when we remind the latter that the non-consumption of milk is not only a barrier to the use of oats, barley, peas, and Indian-corn meal, but that it also upholds an antiquated, expensive, and opposite practice, they will readily perceive that a proper supply of it is the first practical step to be taken in the reformation of cottage cookery, and that the present dear season is the most favourable opportunity for taking such a step, and one, therefore, which we hope will not be overlooked by them. We prefer new milk to skimmed ourselves, and, as a matter of consistency, extend the same freedom of choice to labourers when able to afford it; but the difference in the price of the two is not in accordance with the difference of their nutritive values. In other words, new milk is much dearer food for a labouring man than skimmed. Butter and cream are such high-priced luxuries in the upper and middle ranks of life, and fetch such long prices, as to be almost altogether beyond the economical and substantial plainness of the cottages of our labouring classes, where cheapness and nourishment must ever form the sound basis of cookery.

Cooped up in villages, without gardens or the means of keeping a pig or poultry, and compelled to purchase in the daily necessities of life by *pennyworths*, is a system which is sucking the very life-blood of our peasantry, estranging the minds of the most intelligent, enterprising, and valuable among them, from the land of their nativity; rivetting, as it were, every "earthly hope" they have, to our colonies; a system which cannot fail ultimately of reducing the moral *status* of this most

useful class, by rendering them incapable of taking care of themselves, and, by sequence, the fit subjects of our poor-law system (?). But, to hold up to reprobation a system which has long since been condemned alike by heaven and earth, is superfluous; and, therefore, we pass over it in the most cursory manner, merely mentioning how much it stands in the way of progress in cottage cookery, before turning to the other and brighter side of the picture, the mutual advantages to be gained by the reformation in question.

Landlords and tenants will be no less gainers than their labourers by granting them cottage-gardens near their work, liberty to keep a pig, and so many poultry, with a proper supply of milk, wheat, oats, barley, peas, potatoes, and other products of their toil, at market prices; and by co-operating with them in the improvement of their domestic affairs generally. Unless they have cottages and gardens adjoining their work, a family meal or economical cooking is almost impossible; and for such, in return, they are able to give longer rents than otherwise can be had. Our large towns, again, are no more than properly supplied with good fresh butter, while railroads have opened up an easy means of procuring an ample supply from our provinces. If farmers, therefore, can get 1s. per lb. for their butter, and an equally good price for their skimmed and batter-milk at home, they will have no reason to complain. But before labourers can give long rents for garden-ground, and a fair price for such a beverage, they must learn to use oat, barley, pea, and Indian corn-meal; and before they can be expected to use such, they must have what they now have not an ample supply of—veg. tables of their own growing, with a pig and poultry to consume the offal. Hence the predicament in which we find ourselves involved, and hence the favourable season for practically commencing operations, so as to get out of it, and be established on a firm foundation favourable to all parties.

W. B.

(To be continued.)

EVERGREEN HEDGES.—THE COMMON LAUREL.

SIR,—In our rage for novelties we frequently overlook the good old plants that have been familiar to us from infancy, and we are all too apt to think that high-priced plants must be better for the money they have cost, and that extreme varieties—such as exists in what are known as "*botanical collections*" of plants—*must* be beautiful. Some of the most striking effects at Elvaston were produced by the old church-yard yew; and I can well recollect the time when no planter would have been considered of sound mind that thought of planting such a poisonous plant. One would have thought that the high and holy associations connected with this tree would have saved it from such degradation, for it was the tree that yielded the bow to the archer for deadly feud; and it was bound up with the budding willow, and distributed in the British church on Palm Sunday; and, lastly, its long life and evergreen foliage, emblematical of

eternal duration, earned it a place in consecrated ground. Still, we have seen that although it had yielded the brand to warfare, the palm to gladness, and the canopy to death, it had become a castaway, and not until an Earl had staked his coronet for its respectability could it be reinstated, and at the present time it is perhaps in as high repute as it has ever been.

I have entered into this prelude to prepare the reader for a far more humble plant, one of less pretensions than the yew, and, what is of infinite importance, one of far less cost at first, and far easier propagation after.

When the chilly blasts of winter come on, we begin to look with the greatest respect upon plants that *then* yield us shelter; even the sere leaf of the beechen tree is better than nothing, and a beech hedge is really a good shelter; but if we could paint its dirty-brown leaves a nice grass-green, it would be a vast improvement to the

beech hedge in winter, and then when we had given it paint, it would still be the brighter for a coat of varnish, and thus finished off, the hedge would be not only a good shelter, but quite handsome in winter time, when such bright leaves are scarce. Now, then, let us set about this work, and get an evergreen hedge cheap and good, to shelter man and beast, and give a gentlemanly air to the residence of the working clergyman, the village lawyer, and the sturdy yeoman; and at the same time give the song-thrush a home and the sooty blackbird a shelter for his young, hoping that if they do not pay us in coin they will in canticles.

I have purchased rooted plants of the common laurel at twenty shillings a thousand! Yes, at one farthing a plant; and I think I may guarantee them to any one home-grown at half that sum, provided the parties will propagate their own.

The plant is so beautiful in its foliage now, after the winter is past, that it is quite gladdening and summer-like to look it in the face; it is seldom injured by the severest weather, and would be altogether unscathed if used as underwood and as thickset hedges. I have seen it thirty feet high, with a perpendicular face—a perfect

evergreen wall—at Dropmore. I have also seen it rising from a point to 12 or 15 feet as a sloping bank by the side of a walk in a wood at Claremont. I have seen it clipped to the form of a perfect cone as a single standard, to a globular-shaped head on a clean pole, and to a low squat mushroom-shaped bush on a lawn, always beautiful as a back ground to such bold flowering plants as the hollyhock and dahlia; it is essential to the higher orders of cultivation as a shelter, and richly deserves to be better treated and more extensively cultivated than it has ever been. It is injurious to cattle, and consequently does not enter into agricultural hedge-rows; it makes about 18 inches' growth annually in good soil; its cuttings, put in in autumn, root during the next summer, and are fit to be transplanted forthwith. With such a plant, therefore, naked homesteads are altogether inexcusable, for it will grow either in the sun or in the shade, hiding ugly blanks under high trees, and garnishing poverty with a princely aspect by hiding old walls, low buildings, and the long train of inelegant but useful and necessary appendages that are invariably attached to all good houses and comfortable homes.

ALEX. FORSYTH.

THE GUANO QUESTION.

The anxiety felt in the public mind on the guano question, the discussion of probable substitutes at a cheap rate, and the temptation of "present prices," induce us to still pursue a subject so fraught with interest to the agriculturist. Though guano, at half its price, may not be obtained in illimitable quantities, there are many substitutes of a value nearly approaching it, which may be available at our very doors. Its economical qualities are extreme portability, high solubility, and cheapness, from its being useful only for the land, and therefore having no great competition from the manufacturing classes. For portability, we do not know its equal. Most manures contain vast masses of inapplicable material. We hardly know any perfectly free from useless compounds or from water. They are bulky or heavy, for instance, in proportion to the fertilizing material. Chemistry has shown that on ordinary cultivated land, phosphoric acid and ammonia are amongst the principal means of obtaining a crop of almost any kind; and though it would not argue that either carbon or lime, or possibly potash, could for ever be dispensed with, still they are the leading features of all good manures. And there are few manures which can be purchased, which are holding their elements so free as to be directly assimilated—ammonia ready formed and bone earth very finely disintegrated; (but most of them have to change) and yet so safely held that ordinary preservation will prevent their dissipation and loss.

Though we are not sanguine as to any real substitute for guano, equal in fertilizing elements, illimitable in quantity and for one hundred shillings per ton, we say we still think we have home resources of vast agricultural value. We allude not here to the sewage of towns—immense as is the value which they possess—because we think we know not, at least as yet, sufficient to say which process shall be applied to every town in the kingdom, with its black, stagnant, poisoning effluvia stagnating and destroying all around by fever and cholera, and a thousand other unsuspected and unseen diseases.

Attention has been directed to our internal resources in various ways, from cattle bones to locked-up coprolites; but an idea of the origin of guano will at once point out to us some sources of partial supply. The guano islands contain 27 millions of tons of guano, or 967,680 million ounces. Vast as is this quantity, it might be deposited by 409,599 birds, if each voided only one ounce of excrement per day, in say six thousand years. And this is all decomposed fish—first, with all the gelatine dissolved out to build up the bird structure; then the bone earth finely pulverised by the process of digestion, assisted by the waste; the urinary or ammoniacal discharge of the birds all incorporated in the dung, and this denuded of moisture and a little reduced by fermentation under a hot sun and in a rainless atmosphere. Rieviera saw the dung itself, from

being white, change colour, during his survey of these islands by the process of fermentation.

And have we no cheap fish, no refuse? and have we no chemical agent which can imitate the seabird's gastric juice, to reduce the fish and refuse to some portable, some concentrated, and some cheap manure? Let it not be supposed we are puffing Pettit's process of drying and rendering soluble in sulphuric acid, or Green's cheaper and more simple process of making fish manure; but we have vast amounts of cheap fish and of fish refuse and waste, which are of immense agricultural value. Every fishing town witnesses the most disagreeable of all sea-side scenes—heaps of fish entrails and dead dog-fish thrown sweltering on the sands, and offending the senses both of smell and taste, in a degree which it is surprising the "spawers" submit to for a moment.

For more than 40 years, fish have been used as manure. The sticklebacks, which abound in the slow streams or rivers in the marshes, are so numerous as to sell for as little as eight-pence per bushel; sprats have been successfully used in hop-grounds in Kent. The refuse of the pilchard fisheries in Cornwall have long ago proved an excellent manure. It was even calculated by Mr. William Young, of Inverugie, that the refuse of the herring fishery of Scotland alone, if preserved and made into compost—the bulky nature of manure making in his day—they would suffice to manure 3,600 acres of land.

Dr. Apjohn, in a recent paper before the Royal Agricultural Improvement Society of Ireland, and referred to at the English Society last week, shows the agricultural value of fish to be very great. He analyzed the haddock and the whiting, and found that the former contained 3.53 per cent., and the latter 3.43 per cent. of nitrogen, and that dried, they contained respectively 13.76 per cent., and 14.43 per cent.

He calculates that abstracting the oil, which is worth in some fish a considerable sum, drying the fish, and treating with sulphuric acid, the sprat and the herring, though worth £3 per ton, are more calculated to make fish guano than either the haddock or the whiting, which with refuse can be had at half that price.

He gives us the analysis of a specimen of the fish guano prepared according to Pettit's plan, which he had analyzed, and the constituents are many of them of great agricultural value. They are as follows:—

Water expelled by a heat of 212 degs.	5.05
Sand	0.33
Oil	2.40
Organic matter	50.72
Superphosphate of lime.....	9.85
Sulphate of lime hydrated	19.62
Sulphate of magnesia	0.71
Sulphate of potash	2.05
Sulphate of soda	2.42
Chloride of sodium	1.12
Sulphate of ammonia	2.72

100.00

The per-centage of sulphate of ammonia, or of ammonia in any form, will at once strike those acquainted with the valuable parts of guanos, but it is considerably understated when calculated as nitrogen; for though the saline ammonia is only about 0.67 per cent., the ammonia equivalent to nitrogen of organised matter amounts to 9.46 per cent., in all giving 10.13 per cent. of ammonia. Then the question occurs, does this stand equivalent to 10 per cent. of ready formed ammonia? This we must see experimentally tested; but we must also bear in mind that if decomposition is required to develop the ammoniacal contents of the fish guano, the phosphate is more soluble than it is in the natural guano. In the latter, it is simply bone earth or finely comminuted phosphate of lime; in this it is the superphosphate, arising from a small quantity of free sulphuric acid. Dr. Apjohn estimates the value of the constituents thus:—

Ammonia	6.00 pence per lb.
Bone phosphate	0.75 "
Gypsum and accompanying sulphate	0.16 "
Bi-phosphate	3.75 "

Giving the fish guano as worth £9 10s. 9d. per ton. He applies the same tests as to price to Peruvian guano, and it is worth £10 18s. 6d. per ton.

These facts alone, without either condemning or recommending Pettit's or Gautier's, or Green's process, show that we have the elements at home of making some not very despicable substitutes for guano.

THE WEST OF ENGLAND AGRICULTURAL SOCIETY.

There are few associations in the kingdom that have "come again" with more spirit, or that promise to effect more real good for those they profess to serve, than the West of England Agricultural Society. So great, indeed, has been the success of those meetings hitherto held, and so cordial the

support afforded those who chiefly promoted them, that we soon ceased to regard the resuscitation as merely in the light of a praiseworthy experiment. The gathering at Plymouth last summer tended the more to confirm us in this, and, so, to speak a little more candidly than we might perhaps have done

had the association been less firmly re-established. We are quite aware that some of those gentlemen to whom the chief credit is here due, were scarcely at first inclined to take the remarks, and few objections we had to make in that spirit in which they were offered. We thought, on the other hand, that "the West of England" was strong enough to be told of any little failings which might strike the eye of a stranger, perhaps sooner than those more closely associated with the business of the society. What, however, we had to say or suggest was solely with the view of perfecting these proceedings. We spoke only as "a friendly critic," and, as such, we are pleased now to be recognised in the new number of the Journal.

It was of this very Journal we had something to complain. It was too close an echo of the Royal Agricultural Society of England, while the papers composing it were almost equally applicable to any other part as they were to the West. It was palpable the Journal did not sufficiently represent or identify itself with the society from which it emanated. The second volume of this work is now before us; and had we the critic's taste for mere fault-finding, we believe our proper course would have been in no way to notice it. The Journal Committee say their first number was received with favour. Their second is one of the best edited books of the kind we have ever yet seen. Without attempting or wishing to do too much, it is now really "The West of England Society's Journal"—addressing itself especially to those within the limit of its operations, and advancing the agriculture of those districts in a way which hitherto has never been attempted.

The number contains three prize essays, all of high merit; the first, "On the Growing of Root-crops," by Mr. Spooner, of Southampton; a second, "On the Bridgewater and other Levels of Somerset," by Mr. Aubrey Clarke; and "A Prize Plan of Double Cottages," by Mr. Arnold, jun. In addition to these, the Committee have also published two commended essays on root-crops, one by Mr. Davy, and another by Mr. Webb King; thus "having the farming of North Devon and Mid Somerset well represented by practical farmers occupying land in each district." Mr. W. Miles, in accordance with a wish from the President, next gives a short paper, but excellent summary, of the different kinds of wheat now in use. He concludes his article with another, borrowed from our own columns, which we must allow him to introduce in his own terms. They convey a just compliment to one who has been, within these few days, subject to unmerited attack. Let us hear, on the other hand, what Mr. Miles has to say of the same man: "In regard to the cultivation

of this grain, I have scarcely ever read a paper which more shortly or lucidly details the best system of cultivation than that which I now enclose, cut out of the *Mark Lane Express* of this week, and purporting to be the substance of a lecture delivered by my old friend Mr. Baker, at the Sparkenhoe Farmers' Club. Coming from an essentially practical man, it may possibly be of interest to our readers."

We must hasten over the many other serviceable papers in a journal of which we repeat we can hardly speak too highly. Mr. Barnett Blake treats on "weeds, and the useful products of the earth;" Mr. Karkeek, of Truro, on "the hereditary diseases of horses and cattle;" and Mr. Robert Smith furnishes a careful and very sound report on the exhibition of live stock at the Plymouth meeting, with deductions as to those sorts best suited to the district in which they were shown. Mr. Acland—the Philip Pusey, we believe, of the journal—gives, with the assistance of Messrs. Pitman and Knollys, a companion account of the implements entered at the same meeting; while the *Farmers' Note Book*, and the usual appendix, with the rules, officers, members, and prize-lists of the society, complete a hand-book just now in its best season, and that cannot be too extensively circulated.

We are pleased, in fact, to find that the country gentlemen of the three counties, Somerset, Devon, and Cornwall, are now taking each a certain number of copies for gratuitous distribution amongst their small tenants. We are quite sure that they cannot but serve themselves equally with the occupiers of their land by the adoption of such a course. It is the small tenant above all others that requires this kind of instruction being dropped, as it were, at his own door. It is, too, from seeing names that he knows, and on whom from his boyhood he has been taught to rely—it is from hearing these telling him how to advance, that he will be induced to do so. There is not a paper in this second number of the West of England Journal, but that the man of limited means may yet make applicable to his own resources; and it is thus that we may further demonstrate the advantages which must arise from a closer union between landlord and tenant. We are told that the former class have generally answered the call made on them by this society. We know that the best of the practical men have done so, while we trust that others may be induced to follow them. "The friendly critic's" task is on this occasion a pleasant one enough. He has had to examine a witness who proves to the full how ably the West of England is doing its duty for the interest of agriculture.

THE LAW OF SETTLEMENT.

No. I.

It will be well to make ourselves acquainted with this portion of pauper legislation, as we are told that it is to engage the attention of our representatives during the present session. The people by rights should be before their representatives, and should give them full instructions as to reforms to be introduced, &c.

As I am well convinced that the question is very imperfectly understood amongst the class to which my letters are generally addressed, I deem it important that a simple statement of the Law of Settlement, together with a slight sketch of its history, should now be drawn. When the subject is discussed in parliament, we shall then be in a better position to form opinions and appreciate merits.

This law, as we shall discover, is of too ancient a date, too universal an operation, to allow us to form a correct opinion of what we should be without it. We can scarcely estimate how a man free of such laws would avail himself of the common resources of the country. It is difficult to see the manner in which a parish would act in its absence, and the same difficulty would exist were we to attempt to compute the effect of freedom on wages—the facilities for movement and habitation on the labouring class, “or their command of comfort for themselves and families, or the connected effects on the employer of labour, and the progress of the industrial arts and the application of capital, or on pauperism, or vagrancy, or taxation.”

Under the operation, for nearly two centuries, of the most stringent, despotic, and searching law that ever controlled the domestic condition and industrial habits of the people, all such matters have been effected, and their character determined. “Under this inevitable law every labourer’s and employer’s habits, the policy of every parish, were formed six generations ago, and ever since every man’s expectation and aspiration have been moulded to it. No man, during all that time, has ever seen one free labourer, or could judge practically what a free labourer would in any circumstances do, or how any employer would really act if he could encounter with such a mere figment in an Englishman’s imagination.”

This being the case, our action of course requires more care; and although I am myself convinced of the detrimental effects of this law upon the vital energies of the nation at large, I will endeavour to avoid all rash assertion, and will employ only the dispassionate test of common sense.

I will in this letter state only the objects and provisions of the existing law, under the general Poor-Law Amendment Act of 1835, as well as under the temporary Removal Act of 1846, and then I shall be able to trace briefly from its origin to its present condition the growth of this form of pauper legislation.

When we know that some men of weight amongst us—the Bishop of Exeter (1), for instance—doubt whether it is not now necessary that settlement of some kind should confer a right to relief, we can have little reason to expect that formerly it was generally thought necessary. Notwithstanding this, Lord Ellenborough, in the case of *Rex v. the Inhabitants of Eastbourne*, very unceremoniously over-ruled a supposed dictum of Lord Holt’s, which certainly implied that a person without a settlement might starve! The obligation to afford relief, irrespectively of settlement, was equally recognised by Justice Bayley in 1824. There is consequently no doubt but that the courts would now enforce the right of a destitute person to relief, be his settlement where it might. The interest of a poor man upon this question can not therefore be upon the ground that a settlement is a necessary condition to relief, because we see

(1) “On the particular hardship” (that of removal) “which has led me to these remarks, I do not think so seriously as you and many humane and wise men with you. I do not see why so great a benefit as gratuitous support, at the expense of the public, should be thought hardly earned by compliance with a condition which the good of the public requires. If even in this age of excessive sensibility it were attempted to excite our compassion for the unhappy officer or soldier whose substance is made to depend on a condition often the most painful to his feelings, who is torn from his family and connexion ‘to die in a remote garrison,’ few of us I conceive would think the complaint worthy of a serious answer. I am myself hard-hearted enough to feel as little sympathy in the present instance. If, indeed, it can be made to appear that the public good does not require the sacrifice, nothing more can be said: every generous mind must rejoice in relinquishing it. But till that is clearly shown, I venture to hope that the Legislature will not be led by its compassionate feelings to abandon a condition which, defective as its operation is found to be, is yet one of the few remaining checks on the most crying evil of the present system—the excessive ease with which parochial relief is obtained. Be it remembered that the misjudging tenderness which has sometimes presided at the enactment, as it has too commonly done in the administration of our poor-laws, has proved in its effects the very reverse of true mercy: it blesseth neither him that gives nor him that takes.” I, who cannot agree with any organized plan of pauperizing a people, and sapping a nation’s strength, can here coincide with the Bishop, though it is possible that we might take our stand upon different ground when preparing for the same action.

that the right to relief is judged to be independent of it. The settlement thus viewed merely represents an ultimate obligation on the part of a particular parish to defray the cost of whatever relief the pauper who is settled in it may require. And the right, accordingly, corresponding to this obligation is—not that of the poor man to relief, but that of any other parish aggrieved by the charge of relieving the pauper in question in the first instance, to transfer the burden to the parish of the settlement. Such transfer is effected by a process called an Order of Removal. “By its authority, the pauper, and those who constitute his family, are delivered to the overseer of the parish to which the order is addressed. Such an order may be made on a variety of grounds, and these grounds form what are called ‘The Heads of Settlement.’”

Head of Settlement.	Origin.	Whether abolished, and if so, when.
Birth	Interpretation of the courts of law and ancient statutes.	No.
Parentage	Interpretation of the courts of law as to legitimate children. Statute as to illegitimate children.	No.
Marriage, with reference to the wife.	Interpretation of the courts of law.	No.
Hiring and service.	Interpretation of the courts of law and statutes.	Abolished in 1834.
Apprenticeship . . .	Interpretation of the courts of law and statutes.	Abolished as to sea service in 1834. Restricted as to parochial apprenticeship in 1844.
Renting a tenement	Statute	No.
Payment of parochial rates.	Statute	Restricted in 1795. Not abolished.
Serving a parochial office.	Statute	Abolished in 1834.
Estate	Interpretation of the courts of law.	Restricted in 1722 and 1834. Not abolished.
Certificate	Statute	Out of use.

These Heads of settlement are not intended, according to authority given, to determine whether a pauper is to be relieved, but to fix which of two or more parishes is chargeable with his relief. Although the heads are numerous, there seems to be one principle common to them all; for they are already directly or indirectly connected with residence—“A child is born for the most part where his parents reside: if he derives a settlement from his father, that original settlement was probably dependent merely upon residence, and involved the condition of a year’s service, or a dwelling in the parish for the statutory term of forty days.” It thus appears clear that the parochial consequences incident to residence (and it was the same with the derivative settlement by marriage) must always have been understood;

and it follows that, to a certain extent, proprietors and rate-payers, as I showed to be the case with the landowners in my letters, upon “Wages,” have been always interested in diminishing the number of cottages to a given parish. And if this is true, which of course we must decide when we trace the history of the Law of Settlement, it must be far from being true that such an interest was introduced for the first time by the act of 1846.

The act of 1846 did not create a settlement by residence, it only imposed certain restrictions on removals; and this it did by prohibiting the removal of poor persons who had dwelt in a parish for the term of five years, or who became chargeable under certain circumstances—such, for instance, as temporary sickness. The statute assumes that the obligation to relieve at once attaches to the parish where the necessity for relief arises; and while on the one hand it no longer allows a parish to transfer the burden to another by means of an order of removal, on the other hand, should a poor person once quit the parish in which he has resided the term of five years, he cannot be sent back to it as if he had acquired a settlement there by such residence.

Many of the witnesses that gave evidence before the Committee that sat in the Session of 1847, “thought that it would have been wiser to have enacted a settlement by the five years’ residence, rather than a mere exemption from removal.” “But,” as it was observed, “the difficulties, in such a case, in the way of establishing the fact of residence, and its character, would be enormous.” These difficulties, I must observe, are by no means slight under the act as it now stands.

The effect of Mr. Bodkin’s act of 1847 is to cause the relief afforded to a certain class of paupers to be repaid from the union fund. This class I find consists of such persons as have been rendered irremovable by the first clause of the statute of 1846, and who had received relief from the parish of their settlement, whilst residing elsewhere, within twelve months of that statute coming into force.

These are the principal provisions of the Law of Settlement and Removal now in force. The evils connected with it are of two kinds:—First, those which directly affect the poor themselves; secondly, those which directly fall upon the rate-payers and the community at large.

There is much indifference amongst farmers concerning the legislation that most nearly affects them, and necessarily much ignorance. If they then neglect their own affairs, and leave them to be managed or mismanaged by others—by an irresponsible and despotic power upon which scarcely the shadow of a check can be imposed—it is scarcely reasonable of them to abuse and complain. The subtle spirit of Centralization is stealing round us: it is winding its

coils about and about us, as we sleep in apparent security; so that when we shall arise, and essay to go abroad at will as was our custom, lo! our limbs shall be bound with fetters stronger than iron or brass. This same spirit has so fastened upon its victims on the continent of Europe, and sucked like a vampire the life-blood of many powerful nations: whose great carcases lie there, in helpless indifference, spoiled by this potent bloodsucker of all vital energy.

Let us beware that we are not so surprised, and robbed of all most precious to us, and at the very moment when we dream ourselves to be most secure.

No. II.

The difference between free institutions and despotic governments is simply the difference between men taking care of their own affairs, and submitting to have their affairs taken care of for them by others.

Having determined to make ourselves thoroughly acquainted with this vexed subject, let us proceed.

In reply to the question, What is our law of settlement? it has been answered—

“Our law of settlement is essentially a law for the maintenance of peace and good order, by determining the lawful place of residence for every man.”

With respect to its origin and progress, it has been remarked—

“Such a law has always been of the greatest importance in the most disturbed states of society: and has, within the historical period, served as a means (in every country in Europe at least) for reclaiming and settling its wild and adventurous, and, more or less, lawless conquerors.”

Upon analyzing this latter statement, and employing the test of historical evidence, we do find that as far as England is concerned, a straight but simple law of settlement, defining the domicile of every man, whatever his condition, is coeval with our earliest authentic institutions; “and these refer evidently to a complete pre-existing system, to which what we now have in writing is only supplemental, and of which we have only an inferential or traditional evidence” (1).

For the sake of arrangement and clearness, I will group the historic evidence under different periods.

FIRST PERIOD.—Men are certainly gregarious in their habits. Whether they are so by nature, or have been rendered so by circumstances, may be open to discussion; but sure it is that the state of society being, in the Anglo-Saxon, Anglo-Danish, and Anglo-Norman times, most disturbed and dangerous, they were forced into associated groups for the sake of mutual protection.

Adoption into such local communities was founded upon the promise to fulfil certain duties, common to all the members of the group. That is to say, every

free man was in his own person a soldier, a policeman, and a judge; having, moreover, pledged himself to be responsible for the peace of the “burh” or “tything,” or that of the free men amongst each other. This oath was called frankpledge.

Every man not so united was regarded as an outlaw—exposed to be slain with impunity (2), and to be chased from out any neighbourhood; and this rigorous observance when hostile races were in such close proximity, and the incursions of foreign tribes frequent, was a very necessary one. Not only were material fortifications raised by these communities, to resist the attacks of enemies; but social barriers were thus added, to thwart and detect any system of espionage. Had we lived in those times, when, in addition to the dangers I have mentioned, desperate malefactors flew from justice, and slaves from service, and evil passions were gratified in hearty barbaric style, we should have looked with suspicion and jealousy upon every unknown, coming to our community without a friendly introduction from the members of another “burh.”

Having such testimonials, the stranger was at once placed under the protection and kinsmanship of the earl or king. But if a man entertained a stranger without such provision, we see, by the following extract from the laws of Ilothaire and Eadric, kings of Kent, A.D. 673-685, that the host was answerable for his guest's deeds:—

“If a man entertain a stranger for three nights at his own home, a chapman, or any other who has come over the marsh, and then feed him with his own food, and he then do harm to any man, let the man bring the other to justice, and do justice for him.”

Every person was bound to shout and blow a horn while travelling, on leaving the high road (3); otherwise suspicion, and its fatal consequences, attached to him. All wandering monks, and witches, and fortune-tellers, &c., &c. (4), were put amongst the *classes dangereuses*, and hunted through the forests without mercy.

The head of a house was answerable for his family, including his servants; the lord for his retainers, bond or free (5).

(2) Laws of King Canute: “And we will that every free-man be brought into a hundred and into a burh, who wishes to be entitled to ‘lad’ or to ‘wer,’ in case any one shall slay him, after he is xii years of age,” &c.

(3) Laws of Ino, king of the West Saxons, A.D. 688 to 725: “If a far-coming man or a stranger journey through a wood out of the highway, and neither shout nor blow his horn, he is to be held a thief, either to be slain or redeemed.”

(4) The laws of King Ethelred, A.D. 978 to 1016: “And if witches or soothsayers, magicians or whores, monks (or death workers) or perjurers be anywhere found in the country, let them be diligently driven out of this country, and this people be purified; or let them totally perish in the country, unless they desist,” &c.

(5) Laws of Canute: “And let every lord have his own household in his own

Such laws, of course, conduced to settled life, to defined and permanent local habitation. And this was a valuable discipline to those who had been so long accustomed to the wandering and predatory habits of uncivilized life. We owe much to it. Our national character in certain respects has been built upon it; and from the conditions imposed upon every "burh," have sprung our municipal institutions. In every such community there must have been an unsettled element, more or less—generally more; and a law of settled domicile was, then, the indispensable condition of security and progress.

The co-operation of the members of each burh to maintain this security, and to promote their progress, amply compensated, and far outweighed the annoyance caused by the law that produced it.

"But the necessity for so despotic a law of settlement, though long felt on the continent of Europe, and still retained in great strictness in the domiciliary law of many states, gradually ceased in England; and with the necessity, the law itself was happily allowed to fall into desuetude. The districts formed by the operation of this law remained, under the name of towns or villas, the integral unit of our territorial division; and the assemblage of free-men continuing formally to hold a view of frank-pledge, constituted the lowest court for local administration for ages after the view of frankpledge, for which they were first framed, had become a mere formality, or was totally neglected even as a form (1)."

At the time when restrictions were placed upon the *right* of locomotion, this same *right* was of so little value to the well-meaning and honest, that the law could not be regarded as *burdensome* therefore: there was but little traffic, no manufacture, and an absence of all desire amongst labourers to carry their labour to better markets than what they found at home. So impartial was the law in its operation, indeed, that one class did not feel victimised to the interests of another.

We may, then, conclude that "the law of this period was what the law of no other period has been in England; really a law of settlement, in the plain and proper sense of the term."

It was, in fact, a restrictive discipline, that proved one of the first steps from barbarism to civilization. It brought men, rambling in the woods and wilds, together; gave them a "local habitation and a name;" and induced habits of civil life by making them protectors of each other's interests, and giving them a stake in certain defined districts, by means of the investiture of capital and labour in the cultivation of the soil.

"burh! and if any one accuse his man of anything, let him answer within the hundred wherein he is cited, as just law is. And if he be accused and run away, let the lord pay the man's wer' to the king," &c.

Lord Bacon says that "the settlement of communities has always been accounted a heroic work; whether it be by the subjecting of inferior people by conquest, by softening men's manners, by the introduction of useful arts, by the assembling of men into civil societies, by the revelation of moral or religious truths, or by the promulgation of humanising and politic laws."

To this law may certainly be attributed some of these results. Compulsory it was; but only so far as to oblige every man to have a *known domicile*, the choice and charge of it being *at his own option*.

A partial, compulsory law of removal it was not: a law of national and popular settlement it was.

NO. III.—SECOND PERIOD.

We may trace another period in the progress of the settlement laws, in the series of statutes against vagrancy.

From the time of the Conquest till the reign of Edward III., England appears to have been very little troubled by vagrant beggars or paupers.

In the reign of Richard II., A.D. 1388, there was an Act which prohibited "any labourer from departing from the hundred or town where he is dwelling" without testimonials; and another, at a later period, directing impotent persons (such as from age or the chances of war were unable to work, and were licensed beggars) to remain in the towns in which they be begging (1), both of which acts confirmed, only, the provisions of the ancient Saxon law.

We find permission given, subsequently, to such impotent folk, in case the inhabitants of any town objected to maintain them, to withdraw to other towns within the hundred; and here we have at least a relaxation of the law of settlement, and a beginning of a series of legislative authorities to *practise begging*, terminating with the 22nd Henry VIII., c. 12, which directs the justices to assign to the impotent poor the limits within which they were to beg.

Under this period we must also notice the manner in which the extraordinary enterprise and migratory energy of the labourers, mentioned in many histories, was met. This circumstance has some bearing upon our subject, although not a very important one. The destructive plague that ravaged England in 1348, (2) so thinned the ranks of free labourers, that the demand for labour rose greatly above the supply. Wages consequently became higher, and men naturally carried their labour to the markets where they

(1) 11 Henry VII., c. 2, and Brooke's Grande Abri'gment.

(2) Such were the circumstances of the poor at this time, that they pushed into any business, those even the most dangerous and infectious, heedless of consequences. This adventurous conduct brought the plague among them in the most furious manner; and their reply to all remonstrances was "We cannot starve; we had as good have the plague as die of want."

could best dispose of it. I will venture to hazard the assumption that they were not bound by any very strong cords of affectionate servitude to the masters they thus abandoned!

The preamble of the 25th Edward III., statute 2, 1350 (3), makes grievous complaints of the "avarice of the labourers in husbandry, artisans, and servants," however, in availing themselves of this rise, (what sort of previous conduct, think you, had engendered this spirit of cupidity?); while the statute itself made it a crime for the labourers to migrate, and the legislating landowners patented a machinery by which wages were to be arbitrarily defined for upwards of two centuries!

"The same statute shows that, before our husbandry labourers had been made inert by settlement laws, they were as ready to carry their labour where it was most wanted, as the Irish, still unparalyzed by such a law, now are." It expressly permits "the people of the counties of Stafford, Lancaster, and Derby, and the people of Craven, and the marshes of Wales and Scotland, and the other parts, to come in time of harvest and labour in other counties, and safely return as they were wont to do before this time." Owing to the great difficulty in allaying this spirit of enterprise amongst the labouring classes, this statute was renewed, confirmed, and extended again and again during the same reign. But as all such legislation, that would seek to sacrifice the interests of the many for those of the few, and dam up the great national river of industry for the sake of turning a few privileged water-wheels, and pleasing a few mill-owners, must be attended with failure, so was it in this case. Precisely as our great centres of manufacturing industry absorb a vast number of the ill-fed and ill-paid from the agricultural districts now, so—only in comparatively augmented numbers—did the husbandry labourers of the 13th and 14th cen-

turies flock to supply the vacuum that was created by the pestilence and other circumstances in certain parts. Nor can it be a matter of wonder that the landowners sought to restrain them by legislation. In those times men thought differently to what they do now (4)—at all events we will say they acted differently—for from many things I hear dropped by one and another, I conclude that much of the same spirit exists now as existed then, and that there would be the same oppression exercised over the whole class of labourers now as there was formerly, and this in the name of *right*, but that the external restraints of society forbid it. At that time a landowner owned property in the persons of his serfs; and whenever a villein fled to any privileged town "or other place enfranchised," and remained there one year and one day, without being seized by his lord, the lord could not after that time enter the franchise to retake him. There had, undoubtedly, sprung up a new class of villeins at this time, but we may easily see that the lords would not readily yield any of the power, and would endeavour to preserve some affinity between the new class of villeins, whose earnings they tried to limit, and the old ones whose persons they had before controlled. Sir F. M. Eden says of the period—"All the restrictions of the legislature on personal industry evince a disposition of this kind; and various statutes to regulate wages, dress, and apparel seem to have been framed with the same view—namely, to curb the aspiring exertions of industry and independency" (5).

As to the inflictions upon the persons of the devoted and "valiant beggars and sturdy vagabonds" of this period, it is not necessary to speak; but it seems that, notwithstanding all the penal statutes enacted against them, in spite of the revolting cruelties to which they were subjected—in defiance of the stocks, the whipping, the continual hard labour, the starvation, the cropping of ears, the slitting of noses, the branding of foreheads, and shoulders, and chests, the slavery for life, and death—they grew and multiplied; nay, they waxed fat, and kicked, like Jeshurun of old.

But we have something to do with the districts to which these poor unfortunates were to be confined, and we find them mentioned as "sometimes as wide as the country; sometimes the hundred, rape, wapentake, city, or borough—still comparatively wide dis-

(3) 25 Edward III. recites—"Whereas, late against the malice of servants which were idle, and not willing to serve after the pestilence without taking excessive wages. . . . And now forasmuch as it is given the King to understand in this present parliament, by the petition of the commonality, that the said servants, having no regard to the said ordinance, but to their ease and singular covetise, do withdraw themselves to serve great men and other, unless they have living and wages to the double or treble of that they were wont to take the said twentieth year, and before, to the great damage of the great men and impoverishing of all the said commonality, &c." It enacts—"That carters, ploughmen, drivers of the plough, shepherds, swineherds, deers, mowers of meadow, reapers of corn, and all other servants, be sworn two times a-year before lords, stewards, and constables of every town, to hold and to do these ordinances." Also 12 Richard II., c. 4. Item, "Because that servants and labourers will not, nor by a long season would, serve and labour without outrageous and excessive hire, and much more than hath been given to such servants and labourers in any time past, so that for scarcity of the said servants and labourers the husbands and land-tenants may not pay their rents, &c." Here the italics are mine. These last words are the window through which this portion of legislation may be viewed correctly! The landlord must have his rent; therefore, the 12 of Richard II.

(4) Sir F. M. Eden, *State of the Poor*—"Imprisonment and branding on the forehead with a hot iron was the lot of the fugitive servant, although he had never consented to enter into the service of his lord, and had been compelled to do so for wages less than he was justly entitled to receive." According to 13 Richard II., c. 3, even artificers and others were liable to be pressed by the lord to get in his harvest; and if a labourer's daughter 18 or 20 years of age was required to serve any master, she must consent to do so, or under statutory provisions be committed to gaol, &c., &c."

(5) Sir F. M. Eden, *State of the Poor*, vol. i., p. 42.

tricts; and sometimes the town—a district even more limited than the parish, which became the final limit, with the exception of the northern counties, where the township is still the limit."

The circumstances which determined the settlement of vagrants may be mentioned under two heads, being really "Heads of Settlement"—namely, Birth and Residence. None could be simpler.

The first mention we have of *Removal* occurs in the time of Edward VI. By s. 10, c. 3, of the 1st of Edward, we understand that "All aged and other impotent poor were, once a month, to be removed from places in which they were found begging, if they had not been born in such places, or had not resided there three years." They were to be carried under the escort of officers on horseback, cart, or otherwise, to the next constable, and so from constable to constable, till they were brought to the place where they were born, or most conversant for the space of three years, "there to be provided for, kept, and nourished of almes."

With respect to this statute there are two opinions.

Rapin says (6)—"This law was thought very severe in a country like England, where slavery seems inconsistent with the privileges of the people. But herein the Court had an eye only to the monks, who being gone from their monasteries, little inured to labour, could not think of working for their livelihood. Those men spent their time in going from house to house to cabal against Government." (These provisions were none the milder because they were made by those who had got possession of the lands of the wandering monks!) "The Court thought that to set them to work was the best means of overcoming this bad habit, and to keep them at home." Upon this our historian observes—"As the law was general, it occasioned *great murmurings among the people.*"

A later authority says of the same act—"Its provisions were not general: the penalty attached to the criminal, to him only; and the legislature did not, for so limited an object, see fit to put the entire population into fetters."

It is then evident that within the compass of this period the law was less a law of settlement and removal than a law for compression of labourers and depulsion of vagabonds.

As to *removal*, it was only applied to impotent poor.

NO. IV.—THIRD PERIOD.

"So hither, thither—upward, downward driven,
Like evil spirits in the tempest's blast,
To them relief nor settlement is given,
Nor hope that this remove will be the last."

DANTE.

I cannot comprise the events of this period, as I have those of the two former, within the limits of one letter.

A Frenchwoman once asked the famous Duchess of Portsmouth why the country is better ruled by Queens than by Kings. "Because," replied her Grace, "under the Queens it is ruled by men, whereas under the Kings it is governed by women." This shrewd remark will not be inaptly illustrated as we proceed.

The humane treatment of the poor was made a special object of attention during the reign of Elizabeth, and engaged the minds of those wise statesmen who shed a brilliance around her throne. Indeed, we have reason to suppose that the Queen herself was animated by the most kindly feelings towards "her poore," and that her personal feelings had something to do with the administration of the poor-laws. Though some acts of sternness and cruelty stained her reign, it was characterized by a long course of benevolent legislation in behalf of the most helpless of her subjects, and closed by the celebrated statute passed shortly before her death, under the provisions of which all relief of the poor in England has now been administered for 250 years. The repeal of those brutal and inhuman statutes of Henry VIII. and Edward VI., which we have noticed, was effected under Elizabeth's rule, together with that one grand act which looms out from amongst the others, and casts them into shade—I mean the emancipation of the serfs, which occurred in 1574.

In treating of the Law of Settlement we have nothing to do with the statute known as the 43 Elizabeth, c. 2, because by it no provision was made either for ascertaining a place of settlement by which indigent poor were to be maintained, or for removing them to any such place. The memory of the great evil that had arisen, and the conviction that little advantage was likely to accrue from any such attempt, had prevented the insertion of removal or settlement clauses in this great statute. The experience of four years, passed under the 39 Elizabeth, c. 3, which contained no such clauses, must have been favourably contrasted with the practice under the whole series of provisions contained in a former act of parliament, *i. e.*, 14 Elizabeth, c. 5.

Destitution was supported wheresoever it was found, without—except in the case of vagrants—any such interference with the labour of the poor, and with their personal freedom, as it was reserved for the restoration of Charles II. to sanction, and for subsequent ages to deplore.

In the second year of the Restoration, commenced under an act known as 14 Car. II., c. 12, A.D. 1662, a perfectly unprecedented system of settlement, the main principle of which has till now been maintained.

The earnest statesmen of those high-minded times, when the claims of civil and religious liberty were privileged to share with his royal mistresses the at-

(6) Rapin's History of England, book xvi., vol. viii., p. 24.

tion of the King, hearing sundry rumours that the poor people are becoming most "incorrigible rogues," and that the number of paupers is greatly increasing, instantly decide that there are "defects in the law concerning the settling of the poor." And these statesmen, being landowners, are urged by another motive to regard the poor and destitute members of the community. The increase of pauperism touches them nearly; and being thus made uneasy in the region in which the centre of English sensibility is by naturalists said to be situated, they hesitate not to seek relief in the arbitrary experiment of the statute. The supply was fully equal to the demand; for, with the demand for legislation arose four bills, two local, and two general. Before the result of this jumble became dignified as 11 Car. II., c. 12, it passed through the following ordeal:—

"The patchwork product of all these measures made its appearance in the house at what is described in the Journals as its *third reading*, on Saturday, the 15th February. The next Tuesday the bill was in the House of Lords. In the House of Lords it was, on the 20th February, after the second reading, referred to a committee of twenty-nine lords, who, leaving no trace of other proceedings, on the 20th of April reported it with some amendments, (none affecting the settlement and removal clause,) which were read and agreed to. On the 28th it was read the third time. All amendments by the Lords had reference to points foreign to the question of settlement and removal; and owing to the pressure of business at the end of the Session, there was a departure from the usual course, in order to facilitate this and other measures. The Commons had, on the 17th of May, requested a conference on several bills, including this; to which the Lords acceded by a message in writing, in these terms:—"That though it be not usual to have a conference upon the amendment of more bills than one at once, yet in regard of the shortness of the time, the Lords do agree to a conference as desired."

At this conference all the amendments were disposed of; and the most stringent, despotic, and searching law that ever controlled the domestic condition and industrial habits of a nation, was passed with less consideration than was bestowed on a Westminster Paving bill of the same date.

What! we say to ourselves, can the whole people of England consent thus to be bound in legal bondage without one hearty genuine English cry—"We will be free!"—ringing from John o'Great's to Land's End? Was there no second Cromwell, no Hampden, no Selden? Where was Milton? We scan the King's speech in vain for premonition of the Government's intention; and we come upon the notice of a determination "to reform the abuses in the packing of butter, and to regulate the pilchard fishery."

What, to our mutton-eating King, was the destruction of the free agency of all the "meaner sort of persons" of England and Wales, to the care of pilchards on the coast of Cornwall and Devon.

Still we are sure that some *independent* member would arise in his place in Parliament, and call the attention of the Legislature to the fact of its being highly probable that the whole grievance complained of—namely, the increase of the poor, and the incorrigibility of paupers—arose from the neglect conscientiously and strictly to administer the statute of Elizabeth, and was owing therefore to official turpitude (which it was), not to a defect in the law. He certainly would have added, "The cause of the pressure which certain honourable gentlemen feel, and to which they seek to apply an ill-contrived and inadequate remedy, is not understood. If honourable gentlemen will look at the price of wheat from 1654 to 1662 they will see that there has been a steady increase from 26s. to 74s. per qr. Now this steady increase in the price of wheat for so many years has not been accompanied by any equal rise in the wages of labour, and great distress is felt by the poorer classes. Hence an increase of pauperism from this temporary cause." But no independent member of that first Parliament of the Restoration arose, and protested against a bill that virtually imprisoned the great body of the English people, each in one-fifteenthousandth part of his country. As it excited no interest within the house, so did it arouse no public commotion without. The press notices it not; no clever pamphleteer turns a sixpence by it; nor is there one petitioner presented on the subject in either house! The whole nation appears to have been in a cataleptic fit—dead to all sense of right and justice—reactionary perhaps to the fierce struggles that had exhausted it during the Commonwealth. "O what a falling off was here!"

The terms of this act appear to be in the greatest degree careless and confused; they yet show us that the act is founded on hypotheses, which if true in the time of Charles II., cannot be so in that of Victoria.

A running commentary upon the statute itself may be useful; but before adverting to the grievances which it was intended to redress, we may as well recall a few facts to mind, well known to all students of the historical records of the Restoration.

The population of the year 1662 is estimated at 4,885,696, and consisted mostly of labourers, servants, artizans, small farmers, and tradesmen very little above artizans. Suppose that this class comprised 4,000,000, which I find to be the computation of a clever political arithmetician for 1688, we find that nearly the whole of the population would be subject to the arbitrary power of the parish-officer, who had license to interfere with any man's liberty tenantry a

house worth less than £10 a-year. Our labourers of this day, a superior class, do not occupy such expensive cottages; but looking at the difference of the currency between 1660 and 1854, such a house would have been worth £50 of our present money. The restriction might as well have been laid, consequently, upon all who had not £100 a-year of real estate; for all having less would have been in the words of the act "likely to be chargeable." According to our writer's calculation, it would have given in 1662 "more than 4,400,000 people as likely to settle in tenements under the yearly value of £10."

From this great mass we must subtract—some authorities say 1,300,000, or 23 per cent., which is simply preposterous; others say 300,000, which would be 1 in 16 of the population, and is nearer the mark—for the dependent and vagrant poor, who legally fall to the care of the Legislature.

We have still the astonishing number of 4,100,000 freemen who are described as "given to a hearty enjoyment of their freedom, apt and enterprising in using it, and resolute in maintaining it," submitting

without a struggle to be deprived, every man of them, of his free agency in choosing his residence, his associates, his employment.

Why, the shackles of serfdom were but just struck from the labourer when he seemingly inclines his ankles to their embrace! and though he is not called a serf, he is more a serf under the 14 of Charles II. than ever; for formerly, could the *slave* but steal away to some walled town, and there evade his lord's grip for a year and a day, he acquired his freedom; but no mere term of residence, endure as it may from generation to generation, can destroy the poor man's liability to removal.

No fact in the whole range of history so astounds me as this—the supineness of the people when such designs were hatching to destroy their liberties. The remark with which I commenced my second letter is admirably fitted to close this—namely, The difference between free institutions and despotic governments is simply the difference between men taking care of their own affairs, and submitting to have their affairs taken care of for them by others. F. R. S.

CENTRAL (OR LONDON) FARMER'S CLUB.

AGRICULTURAL STATISTICS—AND THE BEST MODE OF COLLECTING THEM.

The usual monthly meeting for discussion took place at the Club house, Blackfriars, on Monday, March 6th, Mr. W. F. HOBBS in the chair. Subject (introduced by Mr. W. Bennett): "Agricultural Statistics—and the best Mode of Collecting them." The attendance of members was very numerous.

The CHAIRMAN said, he was happy to see so influential a body of agriculturists assembled to discuss a subject which was of great importance, not only to the agricultural interest, but to the commercial portion of the community, and to the population of Great Britain at large. This question was brought before the club at the December meeting in 1846; and the farmers of England were therefore comparatively alive to it, and aware of its importance. He had no doubt that the gentleman who had been selected by the committee to introduce the subject would bring it forward in the manner that he might justly be expected to do, from his great knowledge and experience of agricultural matters. He hoped, too, that the members of the club who were present would view the question in all its bearings; not only as regarded themselves as farmers and producers, but also as regarded the consumers and merchants of the country. It was a broad question, and one in which farmers were certainly most deeply interested at the present time; and he trusted that the farmers of England would not fail to express their opinion as to the bearing of the question on their interests, and more especially with regard to the machinery and expense necessary for carrying out the object (cheers).

Mr. BENNETT said: Mr. Chairman and gentlemen, the subject I have to introduce to you this evening is that of *Agricultural Statistics*, or in plain phraseology, simply this—Does the nation require some more efficient record of the state or capabilities of agriculture? and if so, to what extent, and how best can this be accomplished? These, gentlemen, are the leading points to which I invite your very candid attention. I say *candid*, because I assure you I have consented to introduce it to your notice at the present juncture, in order to get before the public the enlightened sentiments of this club, rather than at all dogmatically to propound my own. Agriculture is that science whose great business it is to provide food for the millions; everything, therefore, relating to it cannot but be fraught with deep interest to the nation at large (cheers). For much as men may differ (and they do differ widely) as to the policy best adapted permanently to procure this ample supply of food to the great masses of the people, every true patriot must regard the object as of great national importance—I might say, as paramount to all others. Next in order, and only secondary in importance, is the procuring this supply with as little fluctuation in price as the precarious seasons and other contingencies inseparable to the production of corn will permit. Miserably low and extravagantly high prices of corn are alike injurious to the public welfare; for on the one hand, in times of excessive cheapness the means of the home grower are taken away, distress prevails through the rural districts, pauperism becomes rampant, improvements cease, the soil is impoverished, and the crops, as a necessary consequence, become mean and scanty; and then, if followed by adverse seasons, a fearful reaction ensues, producing on the other hand great dearth and scarcity, the effects of which are still more wide-spread and disastrous, becoming, in fact, no small national calamity. Great, however, as is the evil, I

scarcely need say to you, sir, and to the majority of the gentlemen I see before me, who know so well the varied casualties incident to agriculture, that an entire preventive to these fluctuations is utterly impracticable. The variation of the seasons alone often baffles the skill of the most eminent agriculturists, and sets at nought the wisdom and devices of leading statesmen. Of this we have recently had the most striking illustration (cheers). It is not my intention to go at all into the question which so long agitated the country; but it is to be regretted that so far the new policy, whatever else it may have done, has done nothing to produce equanimity in prices, nor, in my judgment, was it ever likely, because, by imposing a uniform duty whether corn is high or low, it offers no inducement to the bonding of corn in plenteous seasons, and, therefore, only facilitates fluctuation, so that here we are at one time below zero, and at another in the torrid zone. But although, sir, this is an evil we cannot entirely eradicate, the Great Author of our being has so ordered it, that many of the ills incident to life may, by the application of human skill and forethought, be greatly mitigated. The one just alluded to I regard as in that category. For if in the art of healing it is commonly thought to know thoroughly the patient's malady is half the cure, on the same principle to know the wants of the people, and the means you have at hand to meet those wants, must be regarded as most essential to the best interests of the community. It is notorious that at present in this great country we have no adequate means of knowing how far we can, from our own resources, feed the population; nor with any degree of certainty what foreign aid we must seek to supply the deficiency. Neither the agriculturist, nor the merchant, nor the government, has any satisfactory data to proceed upon by which they can come to any sound conclusion upon the subject. Hence one while, if supplies come in pretty thickly after harvest, everybody supposes that the season is an abundant one. The consequence is that prices are forced down beyond their legitimate level, till all of a sudden the nation is disabused. Intelligence arrives of failing crops in different parts of the continent, the effects of an unpropitious season at home prove to be more disastrous than was expected, and the nation, like an improvident family, having made no reserve in times of plenty, finds her resources diminishing, and knows not to what extremity she may be driven. Alarm seizes the public mind, excitement prevails in the market, merchants despatch their agents to scour the corn-growing districts of the world; till the thing is again over-done. The markets become glutted, to the great injury of the home-grower; merchants are impoverished, and not a few bankrupt, and all because corn is wanted, but nobody knows how much. This tragedy was played off with the most fearful consequences in 1817, and is doubtless still fresh in your recollection; and I am not sure, ere 1854 closes upon us, we may not have a repetition of the scene. Or on the other hand, these facts being patent to our merchants, and smarting under their former losses, they may hesitate to purchase from abroad even what is wanted, and prices still go up to an alarming extent, and this (we repeat it), because all are alike ignorant whether *five* or *seven*, or even eight millions of qrs. of foreign corn are required to meet the emergency. Surely the simple narration of these facts may suffice to show that some better system is imperiously called for, by which we may ascertain our poverty or riches, as regards the possession or non-possession of the great staff of life (loud cheers), and which it seems can only be effected by some general annual estimate of the probable supply of food within our own resources. This brings us to the next point of our argument—to what extent is this additional information required? And here I purpose to make short of it. I shall treat the question

simply as a question of food, and as such, I cannot believe for a moment that the yemen of this country, when they fully understand it, will hesitate to give their compliance. But for any man to suppose, as some do, that the agriculturists will be disposed to submit every operation of the farm, in all its details, to any inquisitorial tribunal, he will be found to calculate without his host. You are aware that our brother farmers are generally very sensitive on this point, and I do not wonder at it. I confess to great reluctance in entertaining the question; and I still think her Majesty's ministers are open to a little inquiry from the farmers. They may say, I think, without rudeness: "But why, my lords and gentlemen, did you not improve the statistics ere you changed your policy? and then, seeing how largely the people are fed after all of home produce, such contemptible notions of British agriculture could never have obtained throughout the country" (cries of "Hear, hear"). This point is, however, so ably touched upon by a noble lord (a supporter of her Majesty's government), in a communication with which he has honoured me on this subject, that I cannot hope to mend it. His lordship says, "I believe the reluctance of the English farmer arises from his distrust of all government interference. I have been and am a free-trader; but I never denied that the farmers have had great sacrifices imposed on them for the good of the community at large;" and then his lordship goes on—"When a horse has been beaten cruelly about the head, it becomes difficult to put on a bridle, even if you do it to take him to water, or to lead him out of a stable on fire." His lordship's simile is a remarkably happy one; there is no mistaking the ill-used horse. But I dare not trust myself further in this direction. Apart, however, from all these considerations, in my conscience I believe the great interests of the nation require some better mode of ascertaining our means. And if you, gentlemen, representing, as you do, a good share of the intelligence of your class, think with me, the wanted and well-tried patriotism of the farmers of England guarantees the object secured. The question, however, again recurs—to what extent, and how can we best attain it? That I do not regard it at all desirable or necessary to descend to the general management of the land I have already intimated, but to such crops and breadstuffs only as concerns the general sustenance of the people. Nor can the publication of private individual holdings be tolerated, although by some means or other these individual holdings must be obtained or you can come to no practical result. Gentlemen, I have read much that has been written upon this very difficult subject, and have been favoured by several useful hints from gentlemen who have kindly written to me upon it. Some, however, seem to me to form very extravagant and erroneous notions upon it. They seem to think that the thing must be done with all that punctilious exactness as regards everything going on upon the farm that it may even involve a fresh survey of the entire rural districts. To this I totally demur. On the other hand, I do not think that the mere sending out return papers, to be gathered in by an enumerator, would alone accomplish what is wanted. My own views are simply these—although I name them with considerable diffidence—that at the edge of every harvest, either the overseer of each parish, or relieving officer for the union, should deliver to every occupier of land, to corn merchants, millers, and perhaps to market gardeners of any extent, a schedule embracing something like the following questions:—What is the number of acres of wheat you have growing in your occupation? and what do you consider is likely to be the average yield per acre?—naming the fields and the acreage of each. Is that in quantity and yield above, or below, or about an average produce of your farm? Are you a holder of old wheat, and to the best of your judgment,

to what extent?—stating whether it is in stack or granary. Are you holding flour, and that to a greater or less amount than is usual at the same time of the year? Are you a grower of potatoes? if so, to what extent? Are they at present diseased or sound? and do you market them, or merely use them for the purposes of the farm? In those parts of the country where oats and rye are used for human food, they should be included. These papers should be filled up and sent, sealed, to the valuer for the union, appointed, I think, by the board of guardians, as such parties would be the best judges of a man's ability for the office, and of his general acceptability among the farmers of the union. Such valuer should be required, with these returns in hand, to inspect the wheat crops of each parish of the union, for the purpose of confirmation or correction, and after working them out, send the result collectively for each union to the Board of Trade. The valuer and his assistant might, if thought desirable, be annually sworn before two county magistrates not to make improper use or exposure of these individual returns; and no one else need have access to them, unless called for in any emergency by the Board of Trade. It might be important that the valuer for the union should be allowed, whenever in his judgment or in the opinion of the Government it was required, to make an addenda to his report in the month of November, when the full result of the harvest would be developed, and a pretty accurate estimate of the yield of the crops obtained. I hardly need add that, the thing being required on public grounds, the Government would feel themselves bound to defray the cost. By such means, Mr. Chairman, I am of opinion that the Government, and all others whom it may concern, might every year, ere that year closed, know pretty well the true position of the country. In bringing these remarks to a close, I may just say that I cannot hope, amidst so much conflicting opinion, to have met your views, or those of my brother farmers out of doors, at all unanimously. With some, I shall be regarded as too timid—as having not gone half far enough; and by others, doubtless, as having gone too far. My reply to the former is, that I can be no party to an unnecessary interference with the business of a farmer, any more than that of the tradesman or manufacturer. What on earth has the Government to do with the system of cropping, as to how much in fallow or how much in corn, or what stock is kept? how many sheep, and whether white or blackfaced? or the bullocks, the pigs, or the poultry—and, forsooth, whether they be of the Malay, Dorking, or Cochin China kind, &c., &c.? (Loud laughter and cheers.) Such returns, if obtained, could answer no valuable purpose. They might, by possibility, disturb the mutual feeling of goodwill and confidence between landlord and tenant, and furnish materials for litigation with a number of law land-agents, who know nothing practically as to the proper cultivation of land. To such objects, I repeat it, I can be no party, and sincerely trust this Club will give no countenance to any such system of espionage. To those who are opposed to any movement of the kind at all, my reply is, that something in this direction must and will be done to meet the requirements of the public; and I think, if properly carried out in some such form as has been humbly suggested, would pretty well meet the exigencies of the case, without any mischievous meddling with the general operations of the farmer; and I sincerely hope the great majority of my friends around me will show that they are prepared to make any reasonable sacrifice of their own personal convenience for the general interests of the country. (Mr. Bennett resumed his seat amid loud cheers.)

Mr. C. JOHNSON said he wished, in support of the observations with which they had been favoured in the

able address of Mr. Bennett—(cheers)—to draw the attention of the club to what was now doing in other trades and other professions besides that of farming (Hear, hear). As a guide for their own course of action, let them just consider what course other manufacturers pursued. He used the term “manufacturers” advisedly; because the farmers yielded in the importance of his pursuits to none of the manufacturers of this country, but stood forth the leader of them all, as the manufacturer of the food on which they all subsisted. As he had observed on other occasions, other manufacturers had an advantage over the class with which he had been for many years identified—the farming interest—in this respect, that they came together more frequently, that they were united in their inquiries, that they came to a common resolution, and that the acts of the majority ruled those of the minority (laughter). He was not aware of any exception to that wholesome rule. If a manufacturer of Manchester, or of Sheffield, were asked whether he could have too much knowledge of his profession, he would stand aghast at the inquiry. He would say at once, “Give me all the information you can. If a dozen pen-knives of a new description are made at the furthest extremity of the globe, let me know it; and let me see if I can get an idea from them.” The members of Parliament who represented manufacturing towns were in the habit of moving for certain returns, and he held in his hand a specimen. His surprise had been caused on observing the imports of palm oil. Probably many gentlemen present knew almost as little about palm oil as he did. Until that evening, when a couple of pots of this article were given to him, he had no idea that the importation of it was likely to trench on the interest of the farmer; but he had now found that there was something produced on the coast of Africa, which was being adopted in all directions as a substitute for tallow in soap, the consumption being increased by the circumstance that in this case the manufacturer was no longer subject to the regulations and restrictions of the excise-man. He had expected to find this article what its name indicated—a kind of oil; it looked, however, more like tallow than oil: it was as hard as pomatum, and was being imported in enormous quantities. Well, now, he found, from the parliamentary return to which he had referred, that a few years ago the quantity of palm-oil imported was only 2,000 cwt. In 1844 the amount was 414,000 cwt., and last year it rose to 523,000 cwt. Another return which he held in his hand contained an account of the number of animals imported—oxen, sheep, and calves—during the last twelve months, and also during 1852 and 1851; it being specified what number were introduced in each month. Then there was a return for every month of the importation of coffee, corn, guano, hemp, potatoes, rice, seeds, timber, and other articles. In fact, the most complete information was afforded with regard to every branch of the imports. Now, the conclusion to be drawn from all this was, that those who moved for such returns, being interested directly or indirectly in these several branches of commerce, felt, after mature reflection, that

the publication of such returns was not likely to do any injury to persons in the trade, but that the more information could be obtained, the better would it be for those who were engaged in the various kinds of manufacture to which it applied. Now, with regard to the question before them, though he came there as a learner, ready to adopt any resolution which might appear to him best for the interest of the farmer, yet he must confess that he could not conceive how they could at any time possess too much knowledge. It must be recollected that most of the kind of information sought for in other cases, by means of statistical returns, was, in some mode or other, acquired by dealers in corn and agricultural produce (Hear, hear). If the harvests were deficient—if the corn did not thresh out so well as had been anticipated, the first general information to that effect was obtained by the great corn-dealers. The farmers, though they might be aware of what was passing in particular localities, were the last persons to arrive at general knowledge (Hear, hear). He earnestly submitted, therefore, to the consideration of the farmers of the United Kingdom, that it was their interest to be put on the same footing as the merchant and corn-dealer in this respect. He could conceive no way of arriving at this result so effectually as by means of a well-regulated statistical return. Such a return, while it should be made with the greatest care, should not be allowed to extend to any inquisitorial examination of the affairs of cultivators of the soil. He thought that in some such way as that suggested by Mr. Bennett, information might be acquired which would extend the knowledge of the farmers of England, without at all trenching on their privacy (Hear, hear).

Mr. R. BAKER said, allusion having been made to the discussion which took place on that question some years ago, he well recollected that on that occasion he declared it as his opinion that this country was behind continental states, as regarded agricultural statistics, and that in a national point of view it was important that a better system should be established. That opinion he still retained (Hear, hear). He could not, however, concede to Mr. Johnson that the returns obtained through the influence of manufacturers had any direct bearing on the question under discussion (Hear, hear). Manufacturers, as was well known, sought these returns for the purpose of regulating their manufacturing operations. They had an abhorrence of a glutted market, because a glut had a tendency to produce depression of price, and they obtained statistical information in order that they might regulate their proceedings by it. Farmers were influenced by very different motives; they produced to the fullest practicable extent, and it was for the interest of the community at large that it should be known whether the coming crop would exceed, equal, or fall below the average, in order that the corn-merchant might be enabled to regulate his transactions accordingly. He had always maintained that well-ordered and well-arranged statistical information was desirable for the community generally, and especially for the traders in corn; and if anything were needed to cor-

roborate this opinion, it would be found in the strenuous endeavours that merchants were now making to obtain statistical returns (Hear, hear). Not that he supposed that farmers would be injured by such information; but he contended that it was the public who would be mainly benefited, and particularly that portion of the public that traded in corn for the sake of the profit which it hoped to gain (Hear, hear). The observations of the noble lord, cited by Mr. Bennett, with regard to the poor horse which had been beaten about the head, were very just. Farmers were not easily led into anything of an inquisitorial nature with regard to their affairs; and if anything compulsory were attempted, it would certainly not have a very good reception from them (Hear, hear). All that was necessary was, that farmers should be called to make a return of the number of acres of each description of grain, and that in each parish or district persons should be appointed, to determine whether the quantity was above or below the average, and if so, to what extent (Hear, hear). He hoped that if a return were made on such a principle, the result would be to get rid of jealousy, on the part of farmers—of their reluctance to state whether they grew a larger or a smaller amount. What was required was a correct average, each farmer being left to state the number of acres on which he grew any particular kind of grain. He did not profess to have studied the question closely; but he thought the boards of guardians were fully qualified to make a return of the average amount of the crops; and, if that mode of procuring returns were adopted, very large expense would be avoided. He could not suppose that farmers would make false returns, or endeavour to baffle the Government in its efforts to obtain correct statistical information. He was convinced that the excellent paper read by Mr. Bennett would tend to relieve the minds of many persons on this important subject. A gentleman who had had a great deal to do with statistical information—Mr. Saunders, of Hemel Hempstead—had lately published a pamphlet on the subject, which appeared to him well worthy of the attention of the public and the Government. He was very glad that the subject had been brought forward; and he trusted it would soon be manifest that farmers had not such narrow feelings as many persons supposed, but that they were as anxious as any other class to do all that they could for the public good, though, at the same time, without forgetting what was due to themselves (laughter).

Mr. WALTON thought the Government should have all the information with respect to the quantity of food grown for the people that was necessary, to guard against a dearth or against any unforeseen circumstances. He understood Mr. Baker to suggest that farmers should make a return, and that valuers should afterwards be employed to fix the value of the acreage.

Mr. BAKER: In districts.

Mr. WALTON continued: A very low estimate must be formed of farmers, if it were supposed that they could not give the value of their own crops. It would be a poor compliment to the British farmer to employ a sort

of middleman to value his produce (laughter). Last year the Government sent out papers to Hampshire, with the view of obtaining a statistical account of the produce of that county; but he for one was entirely opposed to the object, in the manner in which it was sought to be attained. If returns were made through the boards of guardians, they would be attended with very little trouble and expense. The making of returns would, he thought, act as a great stimulant to agriculture. Secrecy and the want of union had been the bane of agriculture, and had kept it in the back-ground (Hear, hear). In conclusion, he would observe that it rested with the landlords of the country to enable the farmers to provide food for the entire population; and, if proper security were given for the investment of capital, farmers would not hesitate to make proper returns (Hear, hear).

Mr. SPEARING said, coming as he did from the county of Hants, he was anxious to say a few words on this question. In the state in which the Government returns were sent to him, he had certainly refused to fill them up, feeling that they were too inquisitorial, and were not likely to be productive of any practical good. By those returns farmers were required to give an account of the number of acres sown with wheat, with barley, with oats, with vetches, with rye; the number of acres in permanent grass, and the number in annual grass; the number of cows, sheep, pigs; and so on. He felt that he should be doing an injustice, not merely to himself, but to the great body of agriculturists, by responding to such a call. To know the number of acres in fallow could be of no possible advantage to the Government; and he knew that there were many small farmers who, if they made such returns to the board of guardians, would probably have them used to their disadvantage (Hear, hear). He declined to make such a return, lest it should get into the hands of magistrates of the county, who sometimes belonged to the board of guardians, and who would probably examine the amount of cattle kept and of corn grown by their tenants, in order to use it against them. He entirely agreed with Mr. Baker that the chief advantage of returns of the quantity of corn would be derived by speculators and corn-merchants. The farmer generally made an estimate of his own production, and knew pretty well what would be the produce of his neighbourhood, and would therefore perhaps be little benefited by the information supplied by the Government return. With regard to Mr. Johnson's observation as to the manufacturers being desirous of knowing how many penknives were manufactured in a distant part of the world, he must say that he thought it had very little to do with the question under discussion; it had much more to do with the question, how many quarters of corn were brought from abroad? He should like to know how many quarters of corn were likely, within the next year, to be brought into competition with the home-grown produce; for no English farmer could be expected to compete successfully with the enormous quantity of foreign corn that had been introduced during the last few years. If they gave the Government information with regard to their own corn, they ought to have in-

formation to guide them with regard to foreign corn (Hear, hear). He could not help remarking that when he refused to make the returns sought for by the Government, he was a little suspicious with regard to the men who asked for them. He said to the man who left the papers, "I decline to make these returns, because I have had a taste before of these gentlemen in office, and because I have sustained loss through their conduct. Before I make such returns, I must have an assurance from them, in their places in the House of Commons, that they will not be used against me." In conclusion, he begged to express his general concurrence in the remarks of Mr. Bennett.

Mr. STENNING said the great question, after all, for them to consider was, what benefit these returns were to the tenant farmer. Might not the object be to lower the price of corn? Free trade had not been found to answer the purpose; the price was much higher than had been contemplated, and the advocates of free trade being alarmed, were now anxious for statistical information. It ought carefully to be observed who had been the chief parties to move in this matter. The movement originated in the sending of a letter to Hampshire by Lord Ashburton. The parties thought, perhaps, that they would succeed best at first with the lower class of farmers; but he believed they had now found out their mistake. As tenant-farmers, they were willing to make any reasonable sacrifice that might be required for the benefit of the nation at large; but they must not forget what was due to their own position, and he thought the object had been sought in a manner which might well excite suspicion. Who were the leaders in the matter? Here was a coalition government, composed partly of Whigs and Radicals who had never felt any concern about the agricultural interest, and partly of those who, boldly professing to be the friends of the agricultural interest, had entirely sacrificed it. The other day a very numerous deputation went before Lord Aberdeen on the subject. Of whom was that deputation composed? Having looked through the names, he had no hesitation in saying that he looked with suspicion on every one of them. He was one of those who went to Mr. Lindsay at the time when he promised to do wonders for the agriculturists, and introduced to them Mr. G. F. Young: they all knew what position Mr. Lindsay had taken up since. He had seen it stated that Mr. Lindsay and Mr. Caird were the principal originators of the memorial to the Earl of Aberdeen; while another active party was a Greek merchant, who had probably realized hundreds of thousands of pounds by his speculations. He maintained, therefore, that though the movement might be very important for the merchant and the ship-owner, it was not so material for the agriculturist. He admitted that they ought not to be backward in lending a helping hand to benefit the country. The time had arrived when something must be done to obtain correct statistical returns; they must put their heads together to discover how these might be secured with the least inquisitorial effects to the agricultural interest. There was one point which was important with regard to the acreage. They were all aware that there

were such things as leases, and that leases had covenants in them, by which the occupiers were materially affected. Under these leases they were restricted to so many acres of wheat, so many of oats, and so on; and if the return which was made showed any deviation, they would be liable to a penalty of so much per acre. (A voice—"So they ought to be.") He differed from that gentleman. If there was to be free trade, let it be complete. Mr. Bennett had suggested that the return should be made in July. They knew very well what would have been the result of making the return in July last year. Though all anticipated a deficient crop at that time, no one, perhaps, thought it would be as bad as it had proved. The return would probably have stated the deficiency at 5,000,000 quarters of wheat. Of course, the information would have been open to the public generally; but they all knew that the merchants were always the first to gain any information of that kind (Hear, hear). When the merchants had learned that there was a deficiency of 5,000,000 quarters, what security would there have been against their importing 15,000,000 quarters? (Hear, hear.) In all probability, the amount which would have come in would have been much in excess of what was required. Mr. Bennett had, indeed, suggested that there should be returns in the shape of addenda in November; but by that time the Baltic would be frozen over—no corn could arrive thence till the spring—and in all probability the result would be that in the next year there would be a large importation coming into competition with the extra corn sown in this country. It was, he conceived, most important that agriculturists should thus consider the effect likely to be produced as regarded themselves, as well as in relation to the community at large.

Mr. ACORN concurred in most of what fell from those practical agriculturists, Mr. Bennett and Mr. Baker. He believed that the voice of the country was in favour of statistics, and as they would come in some form or other, the question was what manner of obtaining them would be least inquisitorial to the tenant-farmer. (Hear, hear.) As statistics had been so much dwelt upon that evening, perhaps he might be allowed to introduce a few. The fluctuations of wheat during the last 20 years were enormous. According to well-authenticated statistics, there were 34,019,000 acres of arable, garden, meadow, pasture, and marsh land in Great Britain. There were also 9,934,000 acres of improvable waste land, and 12,885,330 acres of unimprovable wastes. Sir Robert Peel calculated, in 1846, that the grain produce of the United Kingdom was 25,000,000 quarters; while Mr. Caird, the *Times*'s commissioner, estimated it at 16,000,000. Mr. Caird said he would guarantee that agricultural statistics should be obtained for England for £20,000 a year; so that it was not so impracticable as it appeared at first sight. There appeared to be a disposition on the part of tenant-farmers to under-rate the value of statistical information. Correct statistics would afford a clear and correct medium of regulating corn and produce rents; it would also enable agriculturists to obtain correct title averages, which at present were in a most disgraceful state of uncertainty. (Hear, hear.) He thought also that great advantage would accrue to tenant-farmers, as regarded the extension of tenant-right; and whether it was carried out by private arrangement, by public enactment, or by means of "Laud Improvement Companies," he did not

care, so that these improvements, whether temporary or permanent, were persevered in. Again, agricultural statistics were necessary on the ground of humanity to the poor, who now felt more than ever the dearth of bread.

Mr. RAMSAY congratulated Mr. Bennett on the liberal views which he had expressed. He did not know that it was the business of the farmer to devise any plan of estimating agricultural produce, any more than it was the business of the maltster to dictate who should be the exciseman. He should dislike any arbitrary proceedings, but surely the Government would not adopt any method which could be subject to that charge. The object was to ascertain the truth, and the more agreeable the means by which it could be ascertained the better. He could see no difficulty in the way except that which might arise from the agriculturists themselves. He could never understand how a knowledge of the produce of the country could be any disadvantage to the farmer (Hear, hear). The farmer was as much interested in obtaining such information as any other trader was in knowing the produce in which he dealt. The experiments already made in England and Scotland had been very satisfactory, and he had no doubt that when the system became general, it would tend to the advantage of the agriculturists, and of the public generally. They must not, however, expect a perfect system at first; that would be too much to anticipate; but he believed they had nothing to fear. He could quite conceive that the farmer would sometimes be startled at the amount of his produce, for at present he did not believe the estimates were always correct; few men being capable of judging with perfect accuracy of the exact position in which they stood, and the amount of produce they possessed. Indifferent and impartial persons should be appointed by the Government, and the investigation should be made as agreeable as possible to the landed interest (Hear, hear). The proposed returns would, he believed, do away with very great fluctuations. When there was a large crop, speculators would hold some portion of it back for the next year, which possibly might be one of scarcity, and thus something like an average price would be maintained. The crop of 1852 was an immense one, and long after the harvest many millers scarcely touched it, but ground the old wheat; and but for that circumstance he (Mr. Ramsay) believed the wants of 1853 would have been dreadful (Hear, hear). He hoped the farmers would take up the question in earnest. They were now able to do so, for they were in a very different position from that in which they were placed two or three years ago. They had got over the pinch, and were now well able to put their shoulders to the wheel, and assist in the elucidation of questions like that under consideration.

Mr. THOMAS wished to know whether it was to go forth from the Farmers' Club that they were willing to unite with the Government in some plan of statistics, or whether they intended to put themselves in direct antagonism to that which the general opinion of the country considered to be conducive to the public benefit. He should be very sorry to find the farmers throwing obstruction in the way of anything that would be useful to the community. Possibly the proposed returns might not be of any particular advantage to the growers of corn; but farmers should divest themselves of any individual feeling, and allow their views and their interests to be merged in those of the country at large (Hear, hear). He desired it to go forth that the members of the Farmers' Club were willing to meet cordially the suggestions of the Government, without, however, pledging themselves to the adoption of any particular plan before it was clearly and plainly laid before them. Whatever means were adopted, none, he thought, should be sanctioned which might afterwards prove a source of litigation between the landlord and tenant (Hear,

hear). The returns should be given in confidence, not for the purpose of ascertaining the produce of particular farms, but with a view of obtaining a general result as to the produce of each county, as soon as possible after the harvest. But though such returns might not be productive of benefit to the farmer, they could not be in any way detrimental to him. He believed that the returns from the various counties would excite a spirit of honourable emulation and rivalry among them, and act as a stimulus to increased exertions. He could not agree with Mr. Walton, that each party should be at liberty to send in the valuation of his own crop; otherwise, certain amateur farmers would be sending in the most extravagant accounts of their produce, and the little expense at which it had been raised (laughter). Some competent person should be appointed to make the estimates, and then there would be a probability of securing a well digested return, which should be satisfactory to the Government and beneficial to the country (Hear, hear).

Mr. SIDNEY said there could be no doubt as to the public benefit to be derived from the proposed returns; and farmers only placed themselves in a false position if they regarded their own interests as different from those of the great body of the people. There was no doubt that the investigation would prove somewhat inquisitorial; but so were all laws. Such inquisitorial proceedings, indeed, followed a man from the cradle to the grave. When a baby was born, an account had to be given of it to the registrar. Then it had to be vaccinated, under a penalty; and a return was required of all the children vaccinated in the country. When a man was married, he had to answer a great many inquiries; when he entered into business other questions were put to him; and, not content with knowing how he earned his money, and how much he earned, the Government sent another impertinent gentleman to ascertain how many horses and carriages he kept, and whether his wife had one or two lap-dogs (laughter). In like manner, there were inspectors of factories and of lodging-houses; and in many other departments of commercial and social life, returns were required not less inquisitorial in their nature than those which the farmers would be expected to furnish (Hear, hear). At present, food returns were generally only the result of guessing. The corn merchant, however, who lived in town, and read the blue books and the newspapers, had a much nearer guess than the farmer who stayed at home and was content with knowing the extent of his own crops. But the farmer was, in reality, as much interested in the matter as the merchant; and if the proposed system were carried out, the farmer who took in his newspaper would obtain all the information now procured by Mr. Sturge and others, who, at the cost of a thousand pounds or more, sent round valuers to make special returns and obtain special information, which the great merchants kept within their own breasts for their own private purposes (Hear, hear). It often happened that farmers, not knowing the produce of the country, sold their wheat when it would be more prudent to reserve it. Afterwards, perhaps, came a panic; and what was the result? A large number of persons rushed into the speculation of corn-buying. They suddenly imported large quantities, and thus raised the freight of ships; the whole shipping trade of the country became disorganized, the price of coals and other articles was raised, and the greatest confusion resulted in all departments of trade. Formerly there were great fluctuations in the price of timber, tea, coffee, and other articles, leading to enormous and hazardous speculations; but now that the exact amount of importation of these articles was known, the prices were more uniform (Hear, hear).

Mr. TATTERSALL thought there could be no question as

to the benefit to the farmer, as well as to the public, which would arise from the proposed returns. He had lately read that the Emperor of the French had mentioned in his speech that ten million hectolitres of corn would be required for the country; that seven millions had been collected, and that the remainder had been purchased. The real wants of the people being known, and an adequate supply being secured, the public mind was at ease on the subject. But for the knowledge of what was really required, speculators might have bought 20 million hectolitres, and thus have inflicted a serious injury on the growers of France. (Hear, hear.) He hoped that the farmers of England would render the Government all the aid in their power, in order that accurate statistical returns might be obtained.

Mr. SKELTON repudiated the notion that the proposal to obtain agricultural statistics originated in a selfish and interested feeling on the part of the corn-growers. It was not a class question; and he was, therefore, glad to hear such a comprehensive view of the question as that taken by Mr. Thomas. Great fluctuations were a serious evil, and a steady market, especially in corn, would prove beneficial as well to the producers as the purchasers.

Mr. SHERER called attention to certain resolutions in favour of a system of agricultural statistics, which were unanimously adopted by the Farmers' Club in 1846.

Mr. ROBERT SMITH thought the resolutions referred to afforded an ample proof that the farmers were not slow in coming forward in such questions; and that they did not (as had been alleged) act as a drag to the Government wheel. He thought a good plan would be to establish a branch office at the Board of Trade, to be in communication with the clerks of the unions; such clerks to give the requisite forms to a properly appointed officer for each parish, who should deliver them to the farmers to be properly filled up and returned, under a penalty; the parish officer to condense the papers into one general return, to be forwarded in due course to the Government.

The CHAIRMAN said he hoped the members of the club would consider the question fully, before pledging themselves to bear the burden sought to be imposed upon them. Whatever might be the benefit to be derived by the public from the returns, he, as a farmer, did not think they would be beneficial to him. (Hear, hear.) He would not, however, oppose the measure, if made as little inquisitorial as possible, and made to include produce of all kinds, manufacturing, mineral, mechanical, and the like. He hoped the farmers would be wide-awake in the matter, and in coming to a resolution, would not allow themselves to be guided by popular feeling or the opinions of the press.

Mr. BENNETT briefly replied. He thought they could not come to a resolution (as desired by the chairman) respecting any other than agricultural statistics, that being the only subject for the evening's discussion. He begged, therefore, to propose—

“Resolved—That the opinion of this club is, that it appears to be expedient for the public benefit that an efficient system of Agricultural Statistics should be established, and also an annual report published of the stock of grain in hand; and, although this club cannot recognize any particular benefit to be derived by farmers from such steps, yet it will cordially concur in them, provided they be carried out in a manner as little inquisitorial as the subject will permit.”

Mr. THOMAS seconded the motion.

The CHAIRMAN then suggested an amendment, which was proposed by Mr. STENNING and seconded by Mr. GRAINGER, to the following effect:—

"That a General Statistical Return of all industrial produce would be most advantageous to the people of this country; that this club is aware of the importance of this great question, and, although they do not believe it will be beneficial to them as growers of agricultural produce, yet they will not give it

any opposition, provided it be carried out in the least inquisitorial manner, and at the expense of the nation."

A vote was then taken, and the original motion declared carried. The proceedings terminated with votes of thanks to the introducer of the question, and the Chairman of the evening.

AGRICULTURAL STATISTICS.

It has been said, and by no means in the way of a compliment, that few people amongst her Majesty's subjects are so apt to become unnecessarily alarmed as the agriculturist. He is continually being frightened at shadows, and flying from ills that are only terrible from the colouring given to them by an over-excited imagination. It is the fashion, we repeat, to receive any complaint the farmer may have to offer in something of this spirit. He is sure to be over-stating his grievances, while, if we only leave him to himself, he will gradually come to find how much ado he has made about little or nothing.

Such censure as this is anything but generally deserved, however applicable it may be in some few instances. We have one of these just now before us. There is an official Bogy, of very formidable aspect, about to march through the country, smelling out the blood of an Englishman, and crying out Fee, fi, fo, fum! wherever he chooses to direct his course. The cultivator of the soil, too, he boldly announces as his especial victim; him it is he will honour, before all others, with his company. And the farmer hearing this, and making the most of it, in the height of his alarm, bars his door, and sits himself down in gloomy silence, resolved to hold out to the last, however long or strong the siege may be continued.

Few will need to be told the title of this monster. He comes upon us in the not uncommon disguise of a national good, and, feigning a mild, persuasive tone, prays for admittance with the assurance that he does not mean to hurt us. His name, like those in the old plays, will give some notion of his character and object. He hands it in through the just raised casement, with some confidence as to its effect. This is startling indeed. Down goes the window, and up go the shutters. The terrified occupier knows him now; and visions of the Inquisition rise before him, and the best secrets of his family become the common talk of the country, and his balance sheet is passed on from hand to hand—and the value of his produce will be lessened, and his landlord will raise his rent, and a Government hostile to his interests will ruin him, and—he gives the key another turn, and is "not at home" to

AGRICULTURAL STATISTICS.

We honestly confess that we never knew the tenant-farmers so needlessly alarmed as some of them at any rate have expressed themselves to be on this subject. We never, either, saw them show less reason for the opposition they have thought it necessary to offer. There was some difference of opinion, as usual, it appears, at the Farmers' Club. We have gone carefully through the report, which is printed at length at page 342 of this number, and arise from it with still less inclination to believe the collection of these statistics can do the English agriculturist an injury. Let any of our readers follow our example, and try thus to make out a case against their establishment. There were present, let it be remembered, some of those Hampshire gentlemen who had previously and so signally declared themselves. Mr. Spearing, for instance, had refused to fill up the papers sent him, "feeling they were too inquisitorial, and were not likely to be productive of any practical good." What did they require? A return of every bushel of corn the farmer grew—head and tail—as Mr. Spearing himself recommended a few weeks since? Not quite so much; but, as he proceeds to tell us—

"An account of the number of acres sown with wheat, with barley, with oats, with vetches, with rye; the number of acres in permanent grass, and the number in annual grass; the number of cows, sheep, pigs, &c.; and so on. He felt that he should be doing an injustice, not merely to himself, but to the great body of the agriculturists, by responding to such a call. To know the number of acres in fallow could be of no possible advantage to the Government; and he knew that there were many small farmers who, if they made such returns to the board of guardians, would probably have them used to their disadvantage. (Hear, hear.) He declined to make such a return, lest it should get into the hands of magistrates of the county, who sometimes belonged to the board of guardians, and who would probably examine the amount of cattle kept and of corn grown by their tenants, in order to use it against them. He could not help remarking that when he refused to make the returns sought for by the Government, he was a little suspicious with regard to the men who asked for them. He said to the man who left the papers, 'I decline to make these returns, because I have had a taste before of these gentlemen in office, and because I have sustained loss through their conduct. Before I make such returns, I must have an assurance from them, in their places in the House of Commons, that they will not be used against me!'"

In the first place, we do not believe these returns would be of anything like so inquisitorial a character as those Mr. Spearing himself would wish to see

enforced. In the next, we are quite sure, as are nineteen reasoning men out of twenty, that they *would* be "productive of practical good." We do not know as yet, certainly, of any intention of each return being published separately throughout the country. We think, on the other hand, that especial steps would be taken to guard against anything of the kind; and that neither country gentlemen nor the Government would have any increased opportunity for venting that spite it would seem from this speaker they bear to the tenant-farmer. On one point we can very cordially agree with Mr. Spearing, and that is as to his being "a little suspicious."

Mr. Stenning (one of the few who followed on the same side) questioned whether the object of these returns might not be to lower the price of corn? "Free-trade had not been found to answer the purpose; the price was much higher than had been contemplated, and the advocates of Free-trade being alarmed, were now anxious for statistical information." Notwithstanding, however, the party from which this step emanated, Mr. Stenning proceeded to admit that they (the farmers)

"ought not to be backward in lending a helping hand to benefit the country. *The time had arrived when something must be done to obtain correct statistical returns; they must put their heads together to discover how these might be secured with the least inquisitorial effects to the agricultural interest. There was one point which was important with regard to the acreage. They were all aware that there were such things as leases, and that leases had covenants in them, by which the occupiers were materially affected. Under these leases they were restricted to so many acres of wheat, so many of oats, and so on; and if the return which was made showed any deviation, they would be liable to a penalty of so much per acre.*"

On which monstrous injustice some one added, in way of comment, "And so they ought to be."

These were the only two speakers, if we except with them the chairman, who really expressed themselves unfavourable to the establishment of agricultural statistics. On the other side were many men well known in the annals of modern agriculture: Mr. William Bennett, who introduced the subject in an address remarkable for that calm, clear tone of reasoning with which so difficult a theme should be handled. With him we may rank Mr. Robert Baker, Mr. Cuthbert Johnson, Mr. Robert Smith, Mr. Thomas of Lidlington, Mr. Skelton, Mr. Ramsay and others. From the very excellent speech of Mr. Thomas—one in every way becoming his position as an eminent agriculturist—we must repeat the following, believing, as we do so, that all the use the Government *would* make of the returns is precisely what Mr. Thomas thinks that they *should*:—

"He desired it to go forth that the members of the Farmer's Club were willing to meet cordially the suggestions of the Govern-

ment, without, however, pledging themselves to the adoption of any particular plan before it was clearly and plainly laid before them. Whatever means were adopted, none, he thought, should be sanctioned which might afterwards prove a source of litigation between the landlord and tenant (hear, hear). *The returns should be given in confidence, not for the purpose of ascertaining the produce of particular farms, but with a view of obtaining a general result as to the produce of each county, as soon as possible after the harvest. But though such returns might not be productive of benefit to the farmer, they could not be in any way detrimental to him. He believed that the returns from the various counties would excite a spirit of honourable emulation and rivalry among them, and act as a stimulus to increased exertions.*"

In coming to a resolution, the members were especially warned by their chairman from being influenced "by popular feeling or the opinions of the Press." We think that the Press of this country has only one opinion on the subject, and that the majority of the members of the Farmers' Club agree already very much with it. For our own part, however anxious and proud to represent the feelings of the agriculturists of this country, we shall ever pursue that course only which we conscientiously believe to be the right one. The experience of each succeeding day but tends the more to assure us that we are right here; and that "popular feeling, the opinions of the Press," and the interests of agriculture, are in this case by no means antagonistic to each other. We do not despair of soon hearing a unanimous expression to this effect—concurring as we do with Mr. Stenning, "that the time has arrived when something must be done to obtain correct statistical returns."

So we are to have an attempt at the obtaining of agricultural statistics. The principle is conceded; the only question is one of the details in carrying out the measure. "The time and mode of inquiry," said Lord Aberdeen, "are therefore now the only points to be determined." But these are precisely the points on which the greatest difficulty exists. The practicability of the system, on the one hand, and the value of it on the other, depend upon this most intimately.

The first manifestly necessary step is to obtain the acreage of the different products. A variety of plans, all simple and efficient, will be suggested for this, and most of them will be successful. The less inquisitorial the better. An overseer of the poor can obtain it without the least difficulty, and without any offence to the parties who supply it. A simple local machinery like this will be readily comprehended, and easily supplied. This will give us the acres in wheat, in barley, in oats, in turnips, and in other crops. But what have we gained? We find, for instance, that we had 15,000 acres of wheat in Haddington, 5,000 in Roxburghshire,

and 627 in Sutherland, on the 20th of May, 1853. And what then? We have 42,000 acres of turnips in the three counties, 443,000 sheep. But what the *available produce will be, is the real question*; and until we get some estimate of this, the whole will be utterly worthless, even if every occupier in the nation made a most careful and accurate return.

We have several pamphlets discussing the question, and some by very able hands. Mr. Dudgeon, of Spylan, who, we believe, acted as one of the Scottish enumerators—a clever and acute man, and an excellent farmer, as well as a man of influence—gave a very elaborate article in the “Quarterly Journal of Agriculture” so long ago as 1850, and gave therein forms for obtaining acreage quantities but not acreage produce. Mr. Dudgeon said—“Well would it have been for the country had we but possessed a full and sound knowledge of facts as regards the *capabilities* of our soil some years ago; and it is impossible to estimate the benefits which would have resulted from *correct information as to our agricultural produce* in 1846-7. A great part of the derangement of the currency might, perhaps, have been avoided, and much ruinous speculation and bankruptcy in all likelihood have had no existence.”

But how could a mere acreage return have helped us? It is true; part of the deficiency of last harvest arose from a small breadth of wheat sown; and this mere acreage statistics would help us a little. But as regards 1846 there was no such deficiency; it was the yield which let us down.

Another writer of considerable ability on agricultural statistics was Mr. S. Sanders, of Hemel Hempstead, whose articles have constantly appeared in our columns: he gave a vast mass of facts and reasonings, in 1847, to show the necessity and utility of the nation taking up the measure. He pressed it on the Government of the day; but they were too poor.

In the same year, Mr. Bailey Denton published a valuable pamphlet, which contained a great many valuable hints on the *modus operandi* of a system of collection, making the whole a rapidly ascertained and faithfully registered bird's-eye view of the agricultural area of the country.

But the *produce* is everything. This is the real pinch of the question; and, unless some mode is adopted by which this can be grappled with, the whole will be a failure, and the deputation which waited on Lord Aberdeen will find their labour to have been utterly lost.

If the grain could be weighed or measured—if it could be subjected to any quarter and bushel return—then merchants would have all they wish for. But, if it depends on the most careful and minute discrimination to ascertain

its varying produce, we fear that any enumeration will be in vain. The farmers cannot be expected to give it; it must be done for them by some one.

The only practicable mode which we have seen suggested is the one of Mr. Milburn, of Thirsk—indeed, we have seen no other attempted—who, in a letter to Lord Carlisle, and subsequently republished in the *Farmer's Magazine*, after describing the mode of ascertaining the acreage through the overseers of the poor, thus proposes to come at the *produce per acre*—the real want of the political economist, the merchant, and the trader:

“For each poor-law union let a valuer be appointed by the Government, who shall, on a certain day, commence and take these returns, either in detail from the overseer, or in a summary to be made by him; and let him make an inspection of the crops in each township of the union, and deliver in an estimate of the average produce, say by the 30th of July. This is to be attached to the schedules, and returned to the central office by the valuator within a certain day; and the officer and clerks of the central establishment shall calculate the whole. An aggregate would thus be obtained from correct and irrefragable data, and yet no occupier's secrets would be betrayed either to the Government, to the landlord, or his neighbours; the valuer making a return only for the aggregate township.”

To the question of the uncertainty of this, he reminds us that it is a mode in which the *produce* of thousands of acres is ascertained every year, in the case of out-going and in-coming tenants.

Lord Aberdeen clearly wished the question of *cost* to be considered. He would have that to submit to the Chancellor of the Exchequer; but it is surprising what very little cost this valuable estimate would really entail. Mr. Milburn thus disposes of the difficulty:—

“Assuming the poor-law unions to average an area of 80,000 acres each, and the average number of occupiers of above 3 acres to be 20 for every 1,000 acres, or 1,600 occupiers in the whole, the cost of enumerators would be £10, and the charge of the superintendent-registrar would be £4, so that the sum of £14 would be expended to ascertain the average of the union. Now, as there would be scarcely 20,000 acres of corn in the assumed area in any union, and as the grass-land crops would not have to be valued, the valuer might very easily form his estimate in ten days—eight for the view, and two for the calculation; this, at three guineas per day, would amount to £31 10s., or, if an additional allowance were made for expenses, it would still be within the sum charged for the enumerators, and supply an impartial, clear, and accurate estimate of produce on which to base any measure which might be required for the safety or advantage of the community in times of scarcity.”

The question will now, however, be fairly dealt with; and some of our establishments have the material and the machinery for working it out in a

manner unobjectionable to the occupier, and satisfactory to the country.

We trust all fair and legitimate assistance will be granted to a measure calculated alike to benefit the producer and the consumer of agricultural produce.

CITY MEMORIAL TO LORD ABERDEEN.

Lord Aberdeen received a deputation from the City on Feb. 25, at Downing-street, to present a memorial on agricultural statistics, which is believed to be one of the most influential, in regard to signatures, which has ever emanated from the City of London. The following gentlemen composed the deputation:—Messrs. John Masterman, M.P., Alexander Matheson, M.P., T. A. Mitchell, M.P., S. Gregson, M.P., F. W. Russell, M.P., John Ingram Travers, R. W. Crawford, W. S. Lindsay, John Dillon, James Caird, John Gladstone, Louis Huth, A. Ralli, J. D. Powles, &c.

Mr. MASTERMAN presented the memorial, and stated the great importance of its object to the commercial interests of the country, which was manifested, in so far as the city was concerned, by the numerous and very influential signatures appended to it. He trusted that his lordship and the government would be enabled to effect such arrangements as would secure the object sought by the memorialists—the collection of accurate returns of the agricultural produce of the country.

Mr. GREGSON, in following Mr. Masterman, said that he had mentioned the subject in the House last session, and received a satisfactory reply from the President of the Board of Trade. Since then some inquiries had been instituted, and returns had been delivered from three counties in Scotland. Similar experiments had been made in two counties in England, and every disposition had been shown on the part of the President of the Board of Trade to make progress in obtaining this information. He might state that the return should be obtained and published with as little delay as possible after harvest, in order to their being of any practical value, for in regard to the Irish returns the value they possessed was much impaired by the fact that they were not delivered till fifteen months after the harvest to which they referred, thus telling us the quantity of corn at our disposal three months after it had been consumed. He might offer, as a striking illustration of the value of such returns, in comparison with the cost of obtaining them, the fact that the quantity of corn annually sold in this country was estimated at 40,000,000 quarters, upon which a fluctuation of only 1s. a quarter amounted to £2,000,000 sterling. Correct returns would, in great measure, check excessive fluctuation. An objection had been made, that the returns might be viewed as inquisitorial in their nature; but it had been satisfactorily shown to the farmers, by Mr. Pusey and Lord Ashburton, that they were the parties who would be chiefly benefited. He could not presume to enter into the detail of the mode of carrying the project into effect. The Tithe and Enclosure Commission-office had been suggested as an already organized body, with competently qualified officers in every part of the country, whose services might be made available in this inquiry. At present there was an uncertainty to the extent, as stated in the memorial, of 1,000,000 of tonnage as necessary to carry the supplies needed from abroad before next harvest. The expense nationally would be nothing, compared to the magnitude of the object and the important interests at stake.

Lord ABERDEEN said:—Hitherto experiments have been made with a view to test the practicability of collecting accurate returns. Those made in Scotland have been very successful. In England the same system has been tried in two counties, Norfolk and Hampshire. At first it was not attended with the same success, as much opposition was offered, and more would have been if the returns had been made compulsory. It is therefore desirable to avoid measures which might appear compulsory. I am happy to say that now there is every prospect of the experiment being attended with perfect success. I have therefore no hesitation in saying, that enough has been done to prove that a system may be extended generally throughout the country, though I am not prepared to say by what machinery. The importance of the object is fully admitted, and its practicability proved. The time and the mode of inquiry are, therefore, now the only points to be determined. The question of expense would have to be submitted to the Chancellor of the Exchequer; but on that point I do not anticipate much objection.

Mr. LINDSAY, after what had fallen from Lord Aberdeen, felt it unnecessary to urge this matter at much length, his lordship having signified his concurrence with the views of the memorialists. He would therefore only add that the signatures to the memorial were those of men representing the most important interests in the city of London, and who did not put their names to any document the object of which they had not fully considered. As an extensive shipowner he was personally cognizant of the evils attending the want of reliable information on this important subject. To illustrate this he might refer to the great fluctuation occasioned in freights by this uncertainty—those from Odessa having varied from 60s. to 170s. since last harvest. This was an instance of the manner in which the want of statistics of the year's produce operated in shipping, but he was aware that it acted no less injuriously on most of the other great commercial interests of the country.

Mr. CAIRD, in reference to what had been said by Lord Aberdeen on the objectionable character of compulsory measures, expressed his belief that a system could be adopted, which he had indeed already prepared, but at that time felt it unsuitable to present to his lordship, by which this objection might be obviated. The main object was to get trustworthy returns at an early period after harvest, and in such a mode as should admit of an easy check on their accuracy. From his personal acquaintance with inquiries of this nature he had no hesitation in saying that a system might be introduced by which all these important objects would be secured. The great fluctuations already mentioned sufficiently proved that, in comparison with their value, the cost of collecting these returns was a trivial consideration. As a further instance of this he might add that the corn crop of the British Islands of 1853 is, when valued by the average prices of this week, worth 40 millions sterling more than it was in the first week of harvest, so entirely are we without reliable information as to the real value of our crops. Accurate information would certainly not remedy the injurious effects of bad seasons, but it would equalize prices, permit of timely arrangements for adequate supplies, and prevent those sudden fluctuations which all admit to be so injurious to commerce and trade. Such statistics were already obtained in the continental States and America, as also in our own dominions, in Ireland and in Canada. He could confirm what had been stated of the great importance to the agricultural interest,

with which he was more immediately concerned, of trustworthy agricultural statistics.

Mr. RUSSELL shortly urged the importance of the subject, which was fully acquiesced in by Lord Aberdeen, and the deputation then withdrew.

TO THE EDITOR.

SIR,—The subject above-named has for some time past taken strong hold on the public mind. The attention of Ministers has been drawn to it from various quarters, and they are pledged to legislate upon it. Such being the case, the discussion of the subject, by those who are greatly interested therein, may not be out of place.

No one can deny that it is the duty of all Governments to make provision for the people, as regards a supply of food, for their subsistence in seasons of scarcity; and of this we have an instance in the French Government at the present moment. The Emperor began his speech to the Legislative Chamber, the other day, to the following effect:—"That as to the measures adopted by his Government to remedy the insufficiency of the harvest, which was estimated at ten million hectolitres, the Government could not undertake to purchase; commerce alone could do it. The Government, accordingly, did the only thing possible, in encouraging purchases and in setting the import of grain free from all duties. Seven million hectolitres of foreign corn had already been imported for home consumption, and the rest was either in bond or on its way. But," added the Emperor, "scarcity hardly at an end, war commences." From this we may infer that the Government of France is much better informed as to the deficiency of the produce of corn at the last harvest than that of England, and know more accurately their position, early in the season, when we are left only to conjecture as to the yield of our own. Their system of collecting agricultural statistics gives them a decided advantage over this country in making provision in good time for a supply of food for the people from foreign countries, when their own supply falls short. This fact has been fully exemplified in the present season, for we find that the French merchants laid in their stocks of wheat at a much less cost than our own, in consequence of the early and correct information which their system afforded; and we scarcely began to think of our own wants till we found large purchases were made from France from the grain-supplying ports. With these results before us, we may reasonably ask, why our Government does not institute some system of the same kind, that we may obtain as early and as correct information as other countries on this important subject?

Perhaps it may be answered that France is under despotic rule, and there the Government can extort answers to enquiries into the particulars of a man's business and occupation, which would not be tolerated by the sons of John Bull, who mortally hate anything which bears an inquisitorial character as regards their private affairs. I do not think, Mr. Editor, that this feeling would predominate to such an extent as to prove an insurmountable obstacle to collecting agricultural statistics in this country, if a judicious system be adopted—one which shall be entirely free from exposing the produce of a farm, both in stock and corn, to the curiosity of the occupier's neighbours. No farmer will give correct statements if that be not avoided.

What I conceive to be meant by Agricultural Statistics, to be of any benefit to the country, is neither more nor less than this—That there shall be collected and registered from every occupier of land the number of acres he holds in permanent grass; what portion of this he grazes, and what he mows for fodder; what number of acres he has on tillage, and how many

under each particular crop of corn, roots, seeds, &c.; and what, to the best of his judgment, he believes will be the yield of each per acre. I do not think it practicable to come nearer to the actual produce than by estimation; because it cannot be thrashed or measured before the return will be required; besides, I think this will be enough to form a tolerably correct opinion of the general yield of any particular harvest. A return must also be made of every individual head of stock upon the farm—describing how many of each are for breeding, and what number for feeding purposes—a distinction being made between young and grown-up stock.

These inquiries may be said to be very particular; but I firmly believe them to be necessary to obtain information sufficiently correct as to the foreign supplies required by the nation before the following harvest. On these particulars, at present, I believe the people and Government of this country to be profoundly ignorant; and all that has been written by those to whom credit has been given for superior judgment on this subject, to be little more than guess-work. Even McCulloch's and Porter's statistics, as regards agriculture, are very far from correct. Such is the general ignorance on this question, that if farmers were asked how many sheep, beasts, and horses were kept in their lordship, what number of acres were in grass, and what in tillage, not one in fifty would be able to answer the question. Some farmers may think the publication of returns of this kind would have the effect of keeping down the price of produce. I admit that prices in all probability would not rise to so high a pitch as they do now, if we were better informed as to the yield of our harvests; but they would rise sooner, and remain more equal, so that the farmer would not get less for his whole produce in the end. Do farmers imagine that extreme prices are an absolute benefit to them? I much doubt this; for though they may obtain an advantage for a short time, a reaction will assuredly occur, which must damage them in the end more than they were benefited. Rents may jump in consequence—labour may rise and remain permanently at a higher rate—taxes and levies may increase, to which they must contribute liberally—beside all the derangement of domestic comfort, and the misery which famine prices entail upon a great portion of the community; which, in some degree, will ultimately be felt to the disadvantage of the producers. Then, for want of knowing our real position soon after harvest, a large quantity of corn is thrashed and forced into the market, and reduces prices below their legitimate level, to the great injury of those who can least afford to sell at a low price; and those only who can keep their corn on hand, from being more wealthy, receive the principal benefit from extreme rates.

It would, Mr. Editor, take up too much of your valuable space to enter into details as to the manner in which such a measure might be carried out; perhaps, at some future opportunity, I may say a word or two on that head.

GEORGE KELBY.

Queenborough, Leicestershire, March 7.

THE CORN AVERAGES.

SIR,—Permit me to convey, through the medium of your periodical, in behalf of myself and brother farmers, our sincere thanks to those members of the London Farmers' Club who so ably discussed, at their last meeting, that important subject—the Corn Averages; showing the incorrect manner in which they are registered, proving a serious injury to a large majority of the owners and occupiers of land, who are deeply interested, being the criterion by which the payment for the tithe commutation is regulated. Although the tenants in general covenant to pay such commutation, it is a rent-

charge upon the land; consequently, the owners of the soil have a considerable interest in the question.

But the incorrect mode of taking the corn averages operates to the injury of the tenant farmers to a much greater extent, who hold their farms subject to a corn rent based upon such averages. Although it may be considered the most equitable plan, if properly carried out, the rent rising or falling with the markets, still it must prove, under the present imperfect method, unjust in the extreme.

The system which was so fully alluded to, respecting the custom of farmers using the inferior corn for their stock, operates very much to their injury, the second quality not being sold, consequently a fair average cannot be taken of the produce.

Inferior wheat is used to a considerable extent for household purposes, producing very indifferent flour. No doubt the best corn would prove the most economical, weight being a sure criterion; such second quality so used is not taken into the scale of the averages, and operates against the producers.

In by-gone days, when the tithes were taken in kind, the tenth of the whole produce was collected without distinction, and such should now be fairly carried out, in conformity with the tithe commutation, a just average of the produce of the land. Great praise is due to the deputation who waited on the President of the Board of Trade, in order to point out the fallacy of the present system to obtain correct averages. They must have been highly gratified with the reception they experienced, also the encouragement by the assurance that the best attention should be given to the subject. By the said interview, with such high authority, it may be inferred that the agricultural interest will be considerably benefited; at all events, it is a grand move in the right direction, and will no doubt prove that an accurate statement of the corn averages cannot be effected until the producers are compelled to make a return, which would act as a check on the purchasers.

I am, yours respectfully,

CHARLES NEWMAN.

Court Farm, Hayes, March 1, 1854.

WINFRITH FARMERS' CLUB.

At the last meeting, the subject of discussion, "The present Corn Returns unsatisfactory and incorrect," was opened by Mr. Robert Damen, of Wool, who feared he had but a very dry subject upon which to direct the attention of his hearers, but he hoped the importance attached to it, both as regarded their own interests as well as on national grounds, would have the effect of inducing them to give to it the attention it deserved. He then referred to the late meeting of the London Farmers' Club, where they unanimously came to the conclusion that all corn should be returned by the sellers, and for non-compliance a penalty should be enforced; and the deputation that waited upon the President of the Board of Trade. "Now," said Mr. Damen, "with all due deference to those gentlemen who are rendering great service to agriculture, I contend the present machinery for taking the returns might be made much more effective, and less expensive, than if made compulsory on the large body of sellers. No one can doubt that the present returns are most defective, from the circumstances that, according to the lowest calculation, at least fifteen million quarters of wheat are annually grown in this kingdom, not six millions of which have ever been returned in one year; this must be a matter of serious consideration, when we reflect that a large portion of the rent of the land and the tithes in this country is based upon corn returns. The law now says that every corn dealer shall make a declaration before a mayor or magistrate that he will duly make fair returns of all the corn he buys in any of the two hundred and ninety towns appointed to receive the returns; on non-compliance he is subject to a penalty of twenty pounds per week. Notwithstanding this, how many are there who evade the law altogether, and that too with impunity! I therefore contend that if the law was so framed as to compel an annual declaration from all dealers to the effect that they would regularly and in due order make true and accurate returns, and at the same time have appointed a board of three disinterested persons in each of the towns to check such returns weekly, and that a list of the names of the corn dealers and millers attending their market should be kept by them, that in case of neglect on the part of either to make the returns the penalty should be enforced—I think this method would be more simple and efficient for obtaining a correct return, than if left to the large

body of sellers, whose returns might be viewed with some suspicion by landlords letting under corn rents, and also by the tithe owner, whilst the buyer has now no interest whatever in making a false return. I would here make an observation on agricultural statistics, as being intimately connected with the subject under discussion. It was hinted by Mr. Cardwell to the deputation that waited on him, that if the farmers would co-operate with the Government in obtaining correct agricultural statistics the Government would assist them in getting correct corn returns. I trust the growers of corn will render all the assistance they can in this matter, it being a subject of great importance to the people of this country, to merchants, manufacturers, and the general consumer, but to none greater than to the producer, who is more benefited by steady moderate prices than by having wheat one year at 40s. per quarter and the next year at 80s. per quarter. A true knowledge of the wants of the country would prevent the occasional excessive importation of grain, which causes great depression in prices for a length of time; and on the other hand the country suffers in times of scarcity from not knowing when to make the adequate provision. In returning to the original subject, it must be borne in mind, that incoming and outgoing tenants are much interested in having correct averages; the present method of striking the averages is manifestly wrong, because they are struck from the price of the lots bought, without taking into consideration the quantity of each, which occasionally would make a difference of seven shillings per quarter on the whole quantity." Several other members briefly addressed the meeting, and expressed their approbation of the views so ably propounded by Mr. Damen; and a motion embodying the sentiments expressed by him was unanimously carried.

TO PREVENT POTATOES FROM ROTTING.—In a recent conversation with John C. McVean, of Scotsville, N. Y., he informed us that last fall, at the time of harvesting the potatoes, he put two heaps in the cellar, dusting one of the heaps with quick lime as they were thrown in from the wagon. The potatoes in this heap kept well, whilst those in the other, not limed, nearly all rotted.—*American Paper.*

HADLEIGH FARMERS' CLUB.

HEADS OF A LECTURE LATELY DELIVERED BY MR. COOK, OF HOLTON HALL, SUBJECT, "THE CONSTRUCTION AND ARRANGEMENT OF AGRICULTURAL BUILDINGS."

The most casual observer cannot but be struck with the vast improvements which have been made within the last few years in agricultural affairs, and all must agree that the first half of the nineteenth century has been a period of great and unrivalled progress; but it is generally said that the tenant-farmer is yet behind other classes, and less disposed to adopt the improvements which are suggested, and to avail himself of the aid of science and experience. This, whether true or false, has its palliatives, inasmuch as the cultivators of the soil have less opportunities of congregating together, and of exchanging the results of their observations and experience, than those who live in populous towns, and whose intercourse is more frequent on that account. Till Farmers' Clubs were established no meetings took place of the members of the agricultural body, consequently there was no interchange of ideas; and the facilities now afforded, by meetings like the present, for discussing subjects connected with farming operations, must, I consider, be advantageous to us all. In these days of active competition it behoves us, therefore, as a class, to set our house in order, and to open our eyes to the improvements that are going on around us; to adopt such alterations in our system of management as will enable us to compete with the foreigner, and to avail ourselves of those beneficial changes which tend to promote economy in our expenses, and thus enable us to produce corn as cheaply as our brethren abroad, who have less outlay than ourselves in *direct money payments*.

I have been led to these few preliminary observations by the consideration of the subject which has been selected for our notice this evening—the *construction and arrangement of Agricultural Buildings*; and there are but few subjects on which we can prosecute inquiry more deserving our attention. It certainly behoves us to enquire whether any and what advantages are likely to result from the substitution of a different class of buildings for those now in general use; whether any saving can be effected, through those means, in the improved health of our cattle—in their aptitude to fatten—in the diminution of the quantity of their food—in the increased value of the manure made, and for general convenience and utility in conducting the business of the farm; in short, whether the open yard should be continued, the manure diluted by every shower, and stock exposed to the weather. My attention has recently been drawn to the particular consideration of these points, with reference to my own occupation. My landlords having last spring determined to erect entirely new buildings upon Holton Hall Farm, it was left to me in a great measure to suggest and arrange the plan on which they should be constructed. I have, therefore, inspected many farm homesteads in this and other counties, and I have availed myself of the opinions of several sound practical farmers and others connected with the management of lauded property. I find there is a decided preponderance among these authorities in favour of covered homesteads; and I entirely coincide with their views. I only regret that I have been so prematurely called before you, as you must be aware that at present I have not had an opportunity of testing by usage these assumed advantages, and that I have nothing to lay before you which has stood the test of my own experience; but I hope, at a future time, to be able to lay before you the

results of the system which I have adopted in my own case; and this I will do faithfully and truly, whether my present notions are confirmed or not.

Having thus arrived at the conclusion that the covered homestead is far preferable to others, I will proceed shortly to furnish you the advantages which I contemplate from its use.

First, the greater facility for fattening cattle, and economy in their food.

We are all aware that economy in this department of our business is much needed; for the process of yard-fattening, under the old system, is very generally attended with a serious loss to the grazier, and but seldom with a profit. I cannot but think that by the erection of lofty and well-ventilated buildings, thus ensuring a tolerably equal temperature and less exposure to vicissitudes of climate, the animals so treated must fatten faster and at a less cost. I am certain they require less food, and that there is much less waste than in an open yard. I assume also that the cattle so treated will be less liable to disease; and this, at the present time, is a great matter for consideration, as so much sickness and loss of life has prevailed in this locality. That these advantages are to be obtained, I have great confidence; and if a saving of only £20 or £30 a-year is effected under this head, upon a farm of 400 acres, it is an important item in the balance-sheet.

Next, I will take your attention to the increased value of manure made under cover, and the saving which is contemplated in its application to the land.

There can, in my opinion, be no question but that manure made under cover is far more valuable than that made in an open yard; and I wish to put a fair and reasonable estimate upon this item. I assume that on a farm of 400 acres (chiefly arable and in a fair state of cultivation) at least 800 loads are made in a year; and it surely is not putting too high an estimate to assume that manure so made is worth 1s. per load more than common farm-yard muck; if so, a further saving of £40 a-year is effected; but in order to keep quite within the mark, I will call this £25 per annum, and add to this the further saving which takes place in labour. As the manure thus made is fit for use from the yard, the additional filling, stirring over hills, and preparing earth bottoms is unnecessary. I had a conversation with a gentleman who farms largely near Chelmsford, a short time since, and he has had time to test the advantages we are discussing, and he assured me that his saving under this head is not less than £40 or £50 a-year upon 700 acres. Formerly the plan pursued was to keep what are called straw-yard beasts fed principally on straw; but experience has taught us that even with the prospect of little or no profit on animals, the farmer must keep a larger quantity of stock, and feed it better, for the sake of improving his manure. The consequence is, that a larger quantity of corn and cake is consumed, and a heavy outlay is thus created. Generally speaking, but little care is bestowed upon the manure so expensively made; and, fortunately, this care is not needed in the covered homestead. There is no surplus moisture; no tanks are required. The straw takes up all the liquid manure, and holds it: thus the quality is retained, and a much less quantity is requisite per acre than

of the common farm-yard muck; and by using it direct from the yards no waste ensues from unchecked fermentation.

Thirdly, I will call your attention to the "general convenience" and the variety of uses to which a covered homestall may be applied, and to the comparative ease of the farmer in his superintendence. I have already noticed the health of cattle; their aptitude to fatten; and the economy of food: to these I would add their adaptation to summer-grazing. I feel confident that if the buildings are properly constructed, with a sufficiency of height and good ventilation, the cattle will not be incommoded with flies, and that green food may be used during the summer months to advantage. The yards are also more easily subdivided, and a greater amount of accommodation can be obtained than on any other system. Next, their uses in a fickle hay time and harvest, for securing the loaded waggons from the weather, is, to say the least of it, a great convenience; and if the health of cattle is secured, a less outlay will be required for the veterinary surgeon.

I am, perhaps, to a certain extent antiquated in my notions—or, at any rate, I shall be thought so by some for not having enumerated amongst the advantages that of spine-feeding. I confess I am not friendly to this discipline. I have had several opportunities of seeing cattle fed upon this plan; but so far as I am able to judge from a short and casual examination, I do not put much faith in the results, and I doubt very much whether they will fatten as fast as they would do in a comfortable covered yard, on an easy bed of dry straw; but if they will, the object which most farmers have in view is defeated, viz., that of converting their straw into manure. I had an opportunity of seeing this system carried out in July last, in some low, badly-constructed boxes; the effluvia from them was most offensive; the poor brutes were punished dreadfully by flies, which were congregated in thousands, and they seemed to me to have just about as much comfort as a fellow on the tread-wheel, and about as likely to get fat. But assuming that all my prejudices against this system may hereafter be dispelled by the greater lights that now rule the day, and that the Mechi and Huxtable plan is the preferable one, then the covered homestall will become doubly valuable on account of the adaptation of the yards for carrying out the spine process. I hope you will pardon the digression in which I have indulged in this division of the subject. I am aware also that there are others whose ideas of progress in other particulars far exceed my own. Some are for dispensing altogether with stables; others with barns; but it will be seen by reference to the plans on the table that I have availed myself of the use of both these old-fashioned appendages. Where stables are dispensed with, boxes generally are used; and this is done to a great extent in some counties. These often are low and much too confined for working horses; and I confess I am unable to detect any advantage over the covered yard either in utility or expense. Others are substituting a circular horse-truck or threshing room for the barn. I can see no particular advantage in this; if there is any at all, it is in the less cost of erection, and even this is doubtful, for I know of instances where this plan has been carried out, that it has been necessary afterwards to build open or Dutch barns near. I come therefore to the conclusion that on a large farm the barn is indispensable; and it affords an opportunity for the employment of labourers in the winter months, when often other employment cannot be found; and I still think that a constant and uniform supply of soft corn, straw, and chaff during this period of the year is very desirable, and these cannot be had without barn-room.

In the early part of the evening I stated that I had relied more on the opinions of those I had consulted, on account of

their long experience in these matters, than on my own; and amongst others I have been favoured with that of Mr. Baker, of Writtle, who is known to most of you. In a letter just received from him he says:—"I some years since wrote an essay for the Royal Agricultural Society on this subject, and I supplied them with plans, &c., for farm premises; but I confess, however, my views are materially changed since that time. Covered yards I now see are best for fattening purposes, but young stock perhaps do as well in open sheds." I have also reasons for knowing that in these views Mr. Beadell, of Chelmsford, entirely concurs, and he has had great experience in his capacity of land-agent, and he has also a covered homestall in use for his own purposes.

I will now furnish you with the opinions of a very eminent agriculturist in Essex, who has had five years' use of a covered homestall:—

How long have you used a covered homestall?—Five years.

Do you find the dung made in it fit for immediate use?—Yes.

Is there any drainage so as to render tanks necessary?—No.

Is there any unpleasant smell during the time it is making?—No.

Is there more or less straw required for littering the cattle?—About the same.

Are the cattle warmer and more protected than in open yards?—Yes.

Do they appear to you to fatten quicker on that account?—Yes.

Is the consumption of food less?—I think it is.

Is the quality of the dung better?—A vast deal.

Do you generally use a less quantity per acre?—Yes: one-third less, with better effect.

Do you consider the homestall useful for cattle during summer?—As much so as in winter.

Do you, from experience, approve of the covered homestalls? and can you recommend them?—I should like to have them on all my occupations, and I recommend them most strongly.

State any objection your use of them may suggest?—I know of none.

Are they useful for the temporary protection of hay and corn during a fickle harvest?—Decidedly so.

Your opinion as to the comparative money value of the dung made in the covered homestall, as compared with that made in open yards?—Nearly double.

Having now enumerated the principal advantages contemplated by the uses of the covered homestall, and the opinions of several gentlemen respecting them, I will now lay before you the results as I estimate them:—

Fattening cattle, and economy in food.....	£2 5
Additional value of manure.....	25
Diminution of expense in labour.....	25
Summer grazing and minor uses.....	15
	—
	90

Say, in round figures, £100 a year upon 400 acres.

This surely is an important item in the year's account, and I do confidently hope and believe that this will be realized by a fair trial.

Having now given my reasons for the adoption of the system, I will state my ideas as to the best mode of construction of the covered homestall, and the cost of erecting it.

The plan on the table represents the accommodation afforded on my own farm; and the elevation and sectional divisions, with specifications, are before you. On the west side are stables for eighteen horses, with chaff and harness houses.

On the north side is a lofty double barn, 110 feet long and 24 feet wide; also two loose boxes, two corn granaries, horse track for chaff-cutter and oat-crusher, root-house, &c. Over the whole of these buildings (with the exception of the barn) there are lofts, 12 feet high in the centre and 8 feet at the sides, affording space for upwards of fifty tons of trussed hay or straw. There are also two capital horse-yards and two bullock-yards. The height of these yards and buildings to the under side of the plate is 21 feet; the outer walls are 14-inch brickwork, and the roof—which is in five divisions, with four lead gutters—is slated on 1½-inch close boards. The roof is intruded. The whole of these buildings occupy a space of 1,300 or 1,400 superficial feet—say 13 squares. Assuming that no old materials had been used, the cost would have been about one hundred pounds or one hundred guineas per square—say £1,300 to £1,400. The three inner roofs have glazed skylights, each 10 feet by 10 feet. Water is laid on in tanks, which supply each yard.

The stables are drained into a liquid manure tank. Looking at the way in which the usual farm homestalls are constructed, I am of opinion that quite as much outlay would be required to obtain the same extent of accommodation; and, therefore, no advantage is to be derived on this head. It may be remarked by some that, generally, covered yards are not to be had unless an entirely new homestall is erected. I am far from thinking that this is the case; on the contrary, in a great many instances, the covered yards could be added to existing barns—where they are lofty and good—at even a less cost than is

usually expended for open sheds. The great desideratum, in my humble opinion, in the construction of the covered homestall, is ample height, which promotes health by a rapid circulation of fresh air; and almost double accommodation is obtained at the trifling cost of a few feet of brickwork in the outer walls. The division of the roof into uniform compartments is the only method of obtaining uniform height; for, if only one or two roofs were substituted for the five shown on the plan, the space must have been necessarily very wide, and the buildings low at the sides, where the greatest height is required. And this is the great fault I have to find with most of the homestalls that I have seen, and it has in many instances been the cause of vexation and disappointment to those who erected them; and the system has suffered in the estimation of the public from a cause which ought not to exist.

If, in laying these few observations before you, I should have induced but one among the many fairly to test the merits of a system which as yet has been but partially adopted, I shall esteem my evening well spent. And allow me to say that if we, as a body, are but as ready and vigilant in adopting the means within our reach as our manufacturing and trading brethren, we shall be better able to combat the difficulties which menace us; and I feel confident that, from the progress now making in the agricultural masses, the day is not far distant when as a body they will be distinguished and renowned for their intelligence, enlarged views, their liberal policy yet wise economy, and maintain that position in society which their great utility entitles them to.

CORN MEASURES IN HERTFORDSHIRE.

In Hertfordshire, wheat is sold not by the quarter, but by the load; and of these loads there is a trinity—No. 1, the load of five bushels; No. 2, the load of five quarters; and No. 3, the load of three bushels. At Hertford, St. Alban's, Hitchin, and Hemel Hempstead, the load is five bushels, and it is only once in every 5s. per load rise or fall in price, that the proportionate price of a load can be resolved into a definite price per quarter; thus 40s. per load is 64s. per quarter; each advance of 1s. per load is equal to 1s. 7d. and 4-5ths per quarter; these fractions, unrepresented by any English coin, continue until the price reaches 45s. per load, which is equal to 72s. per quarter, and every advance of 5s. per load is equal to 8s. per quarter; the absurdity of buying or selling by this arbitrary standard is therefore manifest; for while it often leaves the seller in utter ignorance of the real price per quarter he makes of his wheat, it causes the buyer to go through a small mental calculation in the rule-of-three, with indefinite fractions for every bid he makes. Now, as to load No. 2.

At Bishop Stortford (east of the county) the load is five quarters; and the farmers who reside at the extreme west of the county, and sell their corn at Aylesbury market, also sell by the load of five quarters; but the load No. 2 has this advantage over load No. 1, that there is a relative price easily defined; thus 40s. per quarter, is £10 per load, 41s. per quarter, £10 5s. per load, and so on.

Lastly, we come to load No. 3. The farmers who reside in the extreme north of the county, and who sell their corn at St. Neot's, St. Ives, and elsewhere, sell by the load of three bushels; this load also is definable by precise fractions: 15s. per load is 40s. per quarter, 16s. per load is 42s. 8d. per quarter, 17s. per load is 45s. 4d. per quarter, 18s. per load 48s. per quarter, and so on.

The confusion of loads of three very different quantities within the limits of our circulation is of course extremely annoying and perplexing; and to be rid of the absurdity we some time since announced our intention of giving quotations of prices at all our country and local markets in imperial quarters only. This, however, does not please; and some parties have actually made it a matter of grave objection that we give our currencies in the imperial quarter instead of the load. To this we can only reply, that when there is one regular and uniform load throughout the county, and that load one which can be rendered into precise relative price per quarter, then we will adopt it. But it is the height of folly to quote prices per load, when our readers at St. Neot's and Huntingdon, Stortford and Tring, Hertford, St. Alban's, and elsewhere, all have a load of widely different meaning.

But the absurdity of our local weights and measures does not end here; for instance, at the Tring Agricultural Meeting of 1852, we examined the prize wheats. Asking the weight of a fine sack of Cheatham white, we were told that it was 3 pecks and 7 lbs. overweight. Here was confusion worse confounded—measure and weight jumbled together! If the person who replied to our enquiry had asked a by-stander his weight and he had replied 5 feet and 9 lbs., he probably would have stared at the folly of the reply. But to persons in other parts of England, the folly of speaking of 3 pecks and 7 lbs. overweight is just as palpable. We found ourselves in a decided case of the pursuit of knowledge, under difficulties; but at length we managed to elicit the following information:—

The standard weight of a bushel of wheat in Hertfordshire is, it seems, 56 lbs.; a peck of wheat is therefore held to be 14 lbs., the overweight referred to the load of five bushels, and consequently the weight of the sack of 18st. 11 lbs. imperial;

but we appeal to all who know anything of either corn or the corn trade whether anything can be more grossly absurd than to mix weight and measure—pecks and pounds together in that manner—and with a sack of FOUR bushels before them, to speak of the weight in a load of FIVE bushels! — Herts Guardian.

TURKEY.

In giving a short account of the Ottoman Empire, we shall pursue a similar course to what was followed in the case of Russia.

Area and Situation.—Turkey is situated in Europe, Asia, and Africa. The European division comprises an area of from 145,000 square miles to 180,000; the Asiatic upwards of 700,000; and the African upwards of 87,000—giving a total of about 1,000,000 square miles, or 640,000,000 acres.

Population.—The inhabitants of this vast territory were obviously more numerous prior to the Christian era than they have been since; for early history, sacred and profane, mention that the various kingdoms comprised within it during the former period were teeming with dense populations, whereas at present they are thinly inhabited. This decrease has been principally confined to the Asiatic department, where the population now only amounts to 16,200,000, being about 23 inhabitants to every seven square miles! European Turkey contains about an equal number of inhabitants to less than one-fourth of the area, and therefore is much more densely populated. The African territory is more thinly inhabited than either of the other two, the numbers being about 4,800,000. The total population is estimated at from 36,000,000 to 37,000,000.

The following is a tabular statement of the area and population in the year 1850:—

	Square miles.	Population.
European Turkey . . .	145,000	16,000,000
Asiatic „ . . .	700,000	16,200,000
African „ . . .	87,000	4,800,000
	<u>932,000</u>	<u>37,000,000</u>

We believe the population and area for the African division, as given above, to be considerably under the mark; but anything like accuracy here is impossible.

Race.—The inhabitants are descended from many distinct tribes, but have been classed into two families—the Turks, or Turks Osmanlis, those professing the Mohammedan faith, and the Rayas (*i. e.* “the flock”), the original inhabitants, who are Christians and Pagans. The former enjoy privileges which the latter are not allowed to exercise; indeed, the latter have, up to a very recent period, been little better than slaves. Such has been their position, that many of them have become Mohammedans for the sake of civil privileges; so that the Turkish family is not only descended of the Tartar and other hordes who founded the empire, but of the original inhabitants whom they subdued. And from Asiatic Turkey being “the cradle of the human race,” there is not a nation in the world which does not trace its origin to that source, while some colonies returned; so that the Christian and Pagan family, looking at the rise

and downfall of kingdoms, must of necessity be equally mixed. The Rayas of Galatia, for example, are the remains of the Galatians to whom the apostle Paul wrote his epistle of that name; and from being a branch of the great Celtic family, a part of which (the Tectosages) had returned from Toulouse, are therefore intimately connected with France and this country.

Language and Literature.—Many different languages are enumerated, two only of which we shall mention, *viz.*, the Osmanli or Turkish, the official language of the empire, and the Arabic, in which the Koran is written, and from which it is never translated. They are among the oldest living languages now spoken, especially the latter, and considered philologically rich. Poets, historians, biographers, and writers on physics, ethics, and theology are numerous; but literature upon the whole has made little progress. Within the last few years, the will appears to have arisen, more especially among the Christian population, and would soon show itself in the condition of the people, were freedom of action tolerated, and the rights of literary men and those for whom they write secured.

Chronology.—The Hegira is the Mohammedan era, and dates from the flight of Mohammed to Medina, or July 16th, A. D. 622

Religion.—There are three systems of theology in Turkey, the Mohammedan, Christian, and Pagan; but idolaters are so few as to be unworthy of further notice.

The Mohammedan is designated “Islam” (*i. e.* elect or salvation), and does not admit of sectarianism. Salvation, however, is not confined to Moslems, for every man who believes in God and does good works shall be saved. Mohammed was obviously an Arabian poet, of no ordinary merit; and the religious theory he established appears to be a poetical effusion, so to speak, founded on the scriptures of the Old and New Testament, in construction such as to meet the peculiar genius of his brethren the children of Ishmael—a poem in which Noah, Moses, Jesus Christ, and the doctrines they taught are admitted as true, but have been superseded by “the apostle of Allah,” “The Prophet” himself, *i. e.*, the greatest of all prophets, and his doctrines, or, where the bible has been supplanted by the Koran, because the former has been corrupted by Jews and Christians.

The Christian family principally belongs to the Eastern or Greek church; but here sectarianism prevails, for there are not only numerous dissenting bodies, but also a division in the Greek church itself. There is, however, more harmony among the different Christian denominations of the East than of the West, in consequence, no doubt, of the Mohammedan religion of the state preventing either the Greek or Roman-catholic church from exer-

cising the supremacy which both lay claim to. Prior to the establishment of the Ottoman empire as it now stands, or before the Turks crossed the Bosphorus, the Bishops of Rome and Constantinople each laid claim to being the head of the church universal, in the language of the west, "the successor of St. Peter and Vicar of Christ on Earth;" and since the Greek church has fallen under the Turkish yoke, it has undergone little change either in doctrine or government. The Greek churches of Russia, Austria, Persia, Greece, and the Ionian Islands, are branches of it, and, with the exception of Russia, look upon the Patriarch of Constantinople as their head; so that it is rather singular to see the only schismatic among them (Russia) now laying claim to be the head of Christendom! Austria, England (for the Ionian Islands), and Greece have more right than Russia to interfere in behalf of the Christians of the Ottoman empire, because they are spiritually subjects, as it were, of the Porte, and therefore have a right to defend the encroachments of the "Pope of the North," whose conduct towards the Armenian Church of Georgia is significant enough. The dignitaries of the Greek Church of Turkey are patriarchs, metropolitans, archbishops, and bishops. Laymen are admitted members of synods; and the working clergy are of two orders, regular and secular, from the former of whom bishops, &c., are only chosen. The Roman-catholic and Protestant Churches are something similar to what they are at home, both as to doctrine and discipline.

In all religions there are many formal worshippers, and the Mohammedan is not an exception from this rule; and, were the Christian population of Turkey to enjoy equal civil privileges with Moslems, the cause of the Crescent would soon be a hopeless one in the East. At present, deducting the independent states of Africa, the two are nearly equal as to numbers; in other words, there are nearly as many Rayas as Moslems.

Government.—The Sultan is an absolute sovereign as to power, but under obligations to reign conformably to the Koran; Traditions of Mohammed; "Kanunnáme," or laws of the Empire founded on these traditions and the Koran; and "the Assembly of the Ulemas" (wise men), in which the Mufti, the supreme judge in all religious and political questions, presides. In the hands of an active prince and energetic government these are limitations easily disposed of; but to the contrary they are the opposite, the power of the Ulemas becoming the weakness of the Empire, as has been proved on the present occasion. In every town there is a Mufti, or "Doctor of the Law;" and the chief Mufti of Constantinople is the high priest of the whole, and styled, by way of distinction, "Sheikh-ul-Islam" (i. e., "Chief of the Elect.") The Empire is divided into thirty-six Eyalets, or Pashaliks, each of which is governed by a Pasha. The African territories of Egypt, Tunis, Tripoli, and Fez, or Morocco, are only nominally subject to the Porte, as also Servia; indeed, Egypt and Servia have both been formally acknowledged by the Sultan as independent principalities.

The Ottoman Empire can no longer be governed exclusively by Mohammedanism, for Christianity must

have its voice in the councils of the nation. Hitherto the reign of the Crescent has, no doubt, in one sense, been a just one; but it is hoped that a day of vengeance is past, and that one of grace is about to rise on this interesting portion of the world, enabling Turkish Christians to look to a higher Source for aid than the arm of Russia.

Army and Navy.—For long the naval and military strength of Turkey has been on the decline, and at the present outbreak was in a state almost totally unfit for duty. The affair of Sinope proves this. No doubt, on the Danube her army has exhibited no ordinary valour; but, putting the highest estimate upon it, it is no longer sufficient to defend the Empire either from within or without. Her growing dependence upon England and France has at length become her only hope. Like woman, her weakness is now her strength.

Physical Geography.—Turkey is a highland and lowland country; presenting the extremes of mountains covered with perpetual snow, and boiling sands in which a stone will sink no one knows how far, and in which rivers are soon lost. Baron de Wrede threw a plummet, with a sixty-fathom cord attached, into a sand gulf, and in about five minutes the end of the cord disappeared! The gulf covered an area of several thousand acres of Arabia. There are numerous salt and fresh-water lakes; and the Danube, Nile, and Euphrates are the principal rivers, affording many facilities for inland navigation; while her shores present the best natural harbours in the world for shipping. The Empire divides itself, as it were, into four parts: the Bosphorus separating European Turkey from Asiatic and African; the latter two are divided again by the Red Sea and Isthmus of Suez; while the peninsular form of Asia Minor, or Anatolia, separates it from the southern portion of the Asiatic. This southern part is further, but less distinctly, divided into three parts—Arabia, Palestine, and the provinces east of them, forming the Pashalik of Bagdad. The African division is also sub-divided into four minor parts—Egypt, Tunis, Tripoli, and Morocco; so that Turkey may be divided into nine parts, each possessing in some measure distinct geographical features, and each area enough to form a separate and independent state.

Climate.—Physical circumstances affecting climate are so many in Turkey as to render it barely possible to convey a general idea of it within our narrow limits. The climate of a country may be greatly improved by the industry of its inhabitants, but unfortunately the reverse has been the lot of that in question; for in no part of the Ottoman Empire is it so good as it once was. European Turkey has suffered least. In it the climate is still highly salubrious for both animal and vegetable life. In Anatolia it is equally good, generally speaking; but what was once the more valuable of the low-lying lands suffer from drought during summer. Palestine has been still more neglected; while many once fertile and comparatively healthy provinces of Assyria, Arabia, and the African territories, are no longer habitable in the summer months even by the Arabs and their flocks. Hence the wandering of these tribes, who during this season pitch their tents on the high table-lands thousands

of miles above the level of the sea, or parched valleys below.

Soil.—In the Danubian provinces it is generally fertile, yielding fine crops under bad farming. There is also much fine land in the metropolitan province of Roumelia, but much that is otherwise; and the same may be said of Albania, Bosnia, and the Islands of the Archipelago, the latter extending over 8,000 square miles. The northern portion of Anatolia, towards the Black Sea, is the most fertile, and probably the richest naturally, of the whole empire. Some of the valleys on the opposite side of the peninsula, on the Mediterranean, are also fertile; but here the mountains rise more abruptly, and to a greater elevation, leaving only a narrow strip in many places along the shore, having no water from April to November; and as nearly all the early works of irrigation have been sacrificed by the Turks, beyond what is required for cattle, the soil, like the climate, has been greatly deteriorated. Ditto may be said for the whole of Palestine. On the high lands of Asia Minor there is an abundance of water; and, in the hands of any other race but Moslems, the once fertile and flourishing shores of the Levant and Archipelago might soon become what they once were—fruitful and happy provinces. For similar reasons, the equally if not more prolific plains of the Euphrates and Tigris are now little better than a desert. The valley of the Nile, in Lower Egypt, still yields corn for exportation from the overflowing of the river; but much of Upper Egypt has been burnt up, as it were, and one part drifted upon another, burying cities and almost every vestige of animal and vegetable life. The Western States of Africa, which at one time exported so much corn to Rome, also contain some fertile valleys; but the footsteps of Islam from the Caspian to the Straits of Gibraltar are as easily traced, as they are from Mecca to the Danube, not only in the families of the unfortunate Rayas, but in the very soil which gave them birth! What a lesson for Turkey, Christian and Mohammedan!

Agriculture.—When such is the state of the soil, what can be expected of its culture? To say, as some have hastily done, that Turkish agriculture has made no progress, would be not only to mislead those of our readers who may know no better, but also to cast a stigma upon the ancient agriculture of the country which it does not merit. The science of this parent of arts has not merely stood still, but been turned backwards so far, that history almost fails to find its parallel in the patriarchal ages of the world; for the Turks have not only neglected the cultivation of the soil themselves, but introduced pastoral and migratory habits, which have prevented the Rayas from doing as they formerly did, prior to the Mohammedan era. In Bessarabia and Georgia, agriculture has improved since those provinces fell under the sway of Russia; and in Egypt, Greece, and Servia, progress has manifested itself in a still higher degree since they became independent states, affording to Turkey practical lessons as to what course she herself should subsequently pursue. There is perhaps no country in the world where more skill and capital is required to carry on agriculture successfully

than in the Ottoman Empire, owing to the necessity of irrigation in the vast majority of provinces, and the gigantic means afforded by Nature for accomplishing it—no country where less encouragement is and has been given, and none where capital, if judiciously invested, under proper security of tenure, would pay better. It were difficult to say, indeed, how many times the present population Turkey is capable of supporting, were her soil cultivated as it might be.

Produce.—European Turkey yields wheat, maize, barley, oats, rye, millet, hemp, tobacco, wine, &c., in abundance, not only for its own inhabitants, but London and other importing markets largely also. The principal exports are from the Danubian provinces. Horses, cattle, sheep, wool, tallow, goats, pigs, &c., are also exported. “Iron, copper, lead, and silver are found, as also gold in considerable quantity, in the sand of rivers. The only mines worked are those of rock-salt.” All manner of European fruits and garden vegetables are grown. As we proceed southwards through Asia, vegetable and animal productions differ slightly naturally; but the above productions are generally grown. The climate and produce of Anatolia have been compared to those of Spain, with which it corresponds in latitude. Palestine is yet a land of milk and honey, olive-yards, and vineyards, although less productive than under the Jews. Arabia is famed for its spiceries; while the dates of Khusistan, in the Pashalik of Bagdad, are perhaps the best in the world. Koordistan yields rice, wheat, barley, sesame, &c., &c. The low lands of the Euphrates, below the junction of the Tigris, also grow an abundance of rice; but the rest of the Pashalik of Bagdad only yields the coarse herbage of the desert to the flocks and herds of the wandering Arabs. Egypt, as already stated, grows corn of all kinds, both for her own wants and those of others. The States of Barbary and Morocco yield wheat, rice, barley, maize, millet, cotton, tobacco, sesamum, olives, dates, almonds, figs, and pomegranates. Horses, camels, asses, cattle, sheep, and goats are reared in great numbers; while wild animals of every kind abound.

Commerce and Manufactures.—The Great Exhibition in Hyde Park, of 1851, taking into consideration the favourable position and productive capabilities of Turkey, said little for her industry in either of those departments. Her Damascus swords, and some other things, no doubt stood high in merit; but her manufactures generally are rude in the extreme. Many of her Greek merchants are wealthy, and carry on a considerable trade in the export of her raw produce for the manufactures of England, France, and Austria; but situated between the East Indies and Europe, the commercial resources of the country have been sadly neglected, for which its government alone is responsible, and out of which it neither has the power nor means to help itself but by a thorough revival of its past policy, conferring upon its Christian population those privileges which they have a right to enjoy; for it is to this portion of her population that Turkey must look for either social or physical reform.

Roads, Railroads, &c.—Of public roads Turkey has

scarcely one within her dominions deserving of the name. The old Roman routes have been partially kept up, but are impassable during winter save on horseback. All government communications are executed by Tartar couriers along those routes where relays of post-horses are kept at intervals. "The ship of the desert" (camel) is the principal beast of burden; and trade is carried on by means of caravans, as in the days of Abraham; and as the soft routes are better for the feet of horses and camels than the hard roads of this country, they are consequently preferred. Egypt has commenced a railway, and has also done much to facilitate the navigation of the Nile since she became independent; and the Austrian Steamboat Company is fast improving the communication between the shores of the Black Sea and Bosphorus. Turkey herself of late years has been getting up an extensive fleet of steam-boats, and only wants civil and religious freedom for her Christians, when a ten-fold increase would soon take place. England has also a large fleet of steamers trading in the Black Sea and Turkish waters.

Such is Turkey. Two theories have been propounded for the settlement of the Oriental question, viz., "The waning of the Crescent," and "the extermination of Islam by the sword of Russia;" and from the brief sketch we have just given, the absurdity of the latter must appear manifest, from the fact that the former is nearly fulfilled, for the sword of Islam has performed its mission, and is now being slowly but surely turned into a pruning-hook. The time may appear long for such a purpose, but what are a thousand years to HIM with whom Turkey and the nations of Europe have to deal? Looking, therefore, at both sides of the question, it is hoped that the period of chastisement is nearly fulfilled, that Christianity is about to be re-entrusted with the destinies of the Ottoman Empire; that the temporalizing supremacy of the Eastern and Western Churches will be effectually and finally excluded; that the exhausted and scorched soil of Turkey will be speedily restored to its primitive fertility; and that seed-time and harvest will rejoice together, in all the happiness of our own peaceful land.

BOARD OF TRADE AND POOR-LAW RETURNS

—The facts recorded by the Board of Trade returns for 1853 are most surprising evidences of the extraordinary onward movements in our commerce. The total declared value of our exports for that year amount to £87,357,306 against £71,375,066 in 1852, and £68,531,601 in 1851. Thus we see that the increase of 1853 over 1852 is twenty per cent., while over that of the year 1851 it is twenty-seven per cent.; but if we go back to the year 1842 (only 11 years) we find the increase nearly one hundred per cent. Can anything more fully exhibit the wonderful power of production possessed by this country, and which, by a reference to these returns, will be found to extend itself to almost every article that contributes to the daily wants of man? And now let us look at the other side of the picture. The returns of the Poor-law Board, just published, show that, notwithstanding the extraordinary activity which has taken place in every branch of our com-

mence; notwithstanding the great progress made in our national wealth, pauperism has greatly increased in nearly every county in England. Of 574 unions in England, the increased number of able-bodied paupers relieved on the 1st January, 1854, was 126,892 against 117,656 in a corresponding period of the previous year, being an increase of 7.9 per cent. Middlesex shows the greatest increase, viz., 32.4 per cent., and Lancashire shows the large increase of 22 per cent.: the "strikes" may account for this. Several of the agricultural counties show a large increase, but those are chiefly counties having large town populations, such as Surrey, which shows an increase of 24.5 per cent.; Hertford, 23 per cent.; Suffolk, 16.7 per cent.; Cambridge, 14 per cent.; Essex, 12 per cent.; and Bedford and Kent each 11 per cent. These returns of our wealth and our poverty afford striking features for reflection upon the internal position of the people of this country.

IMPORTS OF AGRICULTURAL PRODUCE.

The subjoined table shows the imports into the United Kingdom of the principal articles of the agricultural produce of the British colonies and foreign countries in each of the last three years:—

TWELVE MONTHS ENDING JAN. 5.

LIVE STOCK—	1852.	1853.	1854.
Oxen & Bulls.. num.	37,674	40,533	56,220
Cows	24,026	25,038	38,328
Calves	24,870	27,490	30,705
Sheep	192,585	217,694	249,446
Lambs	9,274	12,343	9,974
Swine & Hogs. "	15,599	10,525	12,757
BONES..... tons	31,956	48,884	37,785
CORN—			
Wheat	qrs. 3,812,009	3,060,268	4,949,314
Barley	" 829,564	625,540	828,670
Oats	" 1,198,529	989,287	1,035,072
Rye	" 24,609	9,967	76,700
Peas	" 99,399	106,394	101,774
Beans	" 318,224	370,912	350,401
Indian Corn.. "	" 1,807,636	1,471,277	1,552,934
Wheat Flour..cwt.	5,314,414	3,865,174	4,646,400
Oatmeal "	" 2,525	457	862
Indn. C. Meal. "	" 9,561	731	15,581
GUANO	tons. 243,014	129,889	123,166
OILSEED CKS.. "	" 55,076	53,939	64,475
POTATOES	cwts. 636,771	773,619	1,133,609
PROVISIONS—			
Bacon	cwts. 181,955	73,952	190,134
Beef (salted not corned) "	" 110,796	122,666	181,997
Beef (fresh or slight salt.) "	" 6,589	2,028	1,289
Pork (salted).. "	" 154,747	95,492	152,599
Pork (fresh).. "	" 53	63	28
Poultry (alive or dead) .. value	£31,523	£34,130	£31,850
Butter	cwts. 353,718	285,458	404,194
Cheese	" 338,659	285,458	398,922
Eggs..... num.	115,526,245	108,281,233	123,618,000
Hams	cwts. 10,164	7,484	
Lard	" 120,409	63,349	

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A WEEKLY COUNCIL was held on Wednesday, the 22nd of February: Mr. Pusey, President, in the Chair.

NITRATE OF SODA.—The President read to the meeting the following extract from a letter addressed to him by Mr. Stevenson, of Edinburgh:—

“February 16, 1851.

“Yesterday, Mr. A. Howden, Lawhead, East Lothian, informed me that he had tested his experiment of last crop with nitrate of soda, 1 cwt. of nitrate and 2 cwt. of salt per imp. acre. The increase of produce was 9 bushels of wheat per imp. acre. It is only by pressing such experimental results upon the attention of farmers, that will produce a general feeling in favour of this valuable fertilizer.”

FISH-MANURE.—Mr. Bullen read to the Council the following Notes on the subject of Fish-manure from Cod and Seal offal:—

FISH OFFAL AS MANURE.—It appears that about two-thirds, say one-half, the cod fish caught is thrown away as waste or offal, so that out of 100 tons of fresh fish you have 50 tons for curing, reduced to 25 tons when dried, and 50 tons of offal. In 1853 there were upwards of 595,000 quintals of dried fish exported from Newfoundland, equal, at 20 quintals to a ton, to about 30,000 tons of cured fish, the produce of 60,000 tons of fresh fish, and 120,000 tons of offal. This offal, at the calculation of one ton to five, ought to give about 25,000 tons of fish manure in a perfectly dried state from cod refuse alone, at present available. As little or no value is set upon it at present, it may be estimated at little more than the price of collection, which, however, would be considerable.

SEAL OFFAL AT NEWFOUNDLAND.—It appears from Governor Hamilton's last report, that there are no less than 367 vessels of from 70 to 180 tons, amounting to 35,760 tons, and carrying 13,000 men, engaged in the seal, oil, and skin trade alone at Newfoundland. About the 1st of March this fleet proceeds to sea, and falls in with what is called the “sealing or whelping ice,” where the seals breed and rear their young, sometimes on the coast of Labrador, and at others on the shores of Newfoundland itself; and, after killing the seals, they strip off the skins, and blubber under the skin, and abandoning the carcasses, they stow them in the hold. The voyage lasts about a month or six weeks, on an average, according to the locality where they fall in with the seals; and sometimes ships return fully loaded in a week or a fortnight, while at others the voyage is a total failure. “Last season, which was considered a most disastrous one to the shipping, there were 550,000 seals killed, from which 7,334 tons of oil were extracted, amounting to £237,957 sterling, or near £30 per ton, and seal-skins to the value of £76,790 sterling, also exported.” The bodies of these seals, which constitute their chief bulk, must have given 50,000 tons, at least, of animal matter. In addition to these sources of the raw material, the seas and bays round Newfoundland abound with fish of every kind, particularly the capelin, as it is called—a species of small sprat, upon which the cod fish live, together with the dog-fish and others, which are peculiarly rich in oil, and can be taken in great quantities by the slightest exertion, or the adoption of improved machinery and system. The chief difficulty to a successful manufacture

is the want of labour, which is dearer at certain seasons in Newfoundland, and more scarce than anywhere else, as there are only 150,000 inhabitants in the island, and they are so exclusively occupied in the fishing and sealing seasons, in summer and spring, that they cannot attend to anything else. But Governor Hamilton, in his excellent report, most judiciously remarks, that “unfortunately in that colony there is little or no employment for the labouring population during the long period which intervenes between the close of the cod fishery in summer and the commencement of the seal fishery in spring,” and that “in the mode and processes of conducting the fisheries themselves there is a great want of economy, and a disregard for improvements which the application of modern science would suggest, and which might be rendered available in advancing the industrial pursuits of the colony.” In conclusion, he says that “there are few parts of the world where the process of converting labour into capital is so speedy, or, for the extent of it, so efficacious, as at Newfoundland. If the catch of seals alone be an average one, upwards of £300,000 is raised off these ‘sealing meadows,’ as they are called, in a few weeks. The sea in this brief season yields a harvest more profitable than the plain, and without the labours of a seed-time, too.” He also remarks that, “since the abandonment of the deep sea fishery on the banks, the cod fishery is now confined to small boats on the coast and in the bays and harbours, and could hardly be carried on without the aid of the seal fishery;” but how vastly would the whole community be benefited by utilising the entire of the produce of both fisheries, in the combined manufactures in question! It is evident that the manufacture cannot be carried on effectively and profitably either at Newfoundland or elsewhere, except by commanding the raw material to an indefinite amount, and at a nominal price, or the price of collecting it. In the cases mentioned, large quantities are now procured for other objects, and wasted; and it is well worthy of consideration how far the increased demand for the article, and the enterprising spirit, combined with the science and machinery of the present day, might not have the effect of establishing a new and profitable trade in this colony, and of utilising the whole animal supply, and of combining the present curing of cod fish, and the cod liver and other oil trades, directly with the manufacture of manure from the refuse. But to effect this, it is evident that the capital, machinery, and skill must be chiefly supplied from this country. Suggestion.—That a series of experiments should be instituted in this city, under the immediate superintendence of the Society and at their expense, for the purpose of ascertaining the best modes of manufacturing the manure. For that purpose that a couple of tons of ordinary fish offal should be procured, at Billingsgate or elsewhere, to experiment on, and to ascertain the exact and relative proportions and prices of the oils, and manure, &c., whether made by simple desiccation or by the action of acids, so as to become thoroughly acquainted with the process, and to suggest such alterations as may be advisable for establishing the system elsewhere.

The reading of this communication was followed by an interesting discussion on this and some other proposed substitutes for guano, in which the President, Mr. Raymond Barker, Mr. Fisher Hobbs, Mr. Cuthbert

Johnson, Dr. Calvert, Mr. Caird, Professor Way, Mr. Mainwaring Paine, Mr. Nicol, Mr. Slaney, Mr. Bullen, and Mr. Pocock took part.

Mr. Harkness, Secretary to the Royal Agricultural Improvement Society of Ireland, favoured the Council with a supply of several copies of the last Journal of that Society, containing the papers of Dr. Apjohn on the subject of fish manures, recently read before its members.

SHEEP-SHEARING.—Mr. Caird submitted to the inspection of the Council one of the new instruments for shearing sheep, invented by Mr. Henry Francis, of West Strand, London; along with testimonials of its value. Professor Simonds expressed his approval of the instrument in question.

The Council having ordered their usual acknowledgments for the communications then made to them, adjourned to their monthly meeting, on Wednesday next, the 1st of March.

MONTHLY COUNCIL, March 1.—Mr. PUSEY, President, in the chair. The following Members of Council and Governors of the Society were also present:—Earl of March; Hon. A. Leslie Melville; Sir John V. Shelley, Bart., M.P.; Sir John V. B. Johnstone, Bart., M.P.; Sir Robert Price, Bart., M.P.; Mr. Raymond Barker; Mr. Barnett; Mr. Barrow, M.P.; Mr. Bramston, M.P.; Mr. Brandreth; Mr. Burke; Col. Chaloner; Mr. Druce; Mr. Foley, M.P.; Mr. Gadesden, Mr. Garrett, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Hornsby, Mr. Lawes, Mr. Lawrence, Col. Mac Douall, Mr. Milward, Mr. Paine, Mr. Pym, Professor Simonds, Mr. Simpson, Mr. Thompson, Mr. Hampden Turner, Professor Way, Mr. Jonas Webb, and Mr. Woodward.

The following new members were elected:—

Allen, Ralph, Bathampton, Bath, Somerset
 Bailey, William, Oaken, Wolverhampton
 Banfield, Thomas C., 18, Queen Square, Westminster
 Biddell, Manfred, Playford, Ipswich, Suffolk
 Biggs, Joseph, Barden House, Tunbridge, Kent
 Bloodworth, Charles, Kimbolton, Huntingdonshire
 Bond, Robert, Therington, Saxmundham, Suffolk
 Bournton, Thomas, Baunton, Cirencester, Gloucester
 Brewster, James, 1, Granville-square, Pentonville
 Budd, William, Aston-le-Walls, Daventry, Northampton
 Butler, Major, Liphook, Hampshire
 Chaffer, Benjamin, Burnley, Lancashire
 Clarke, Edward, Glentworth, Lincolnshire
 Cresswell, R. Ward, Ravenstone, Ashby-de-la-Zouch
 Crossley, Robert, Holland Street, Newton, Manchester
 Cust, Captain Harry, Cockayne-Hatley, Biggleswade
 Daniell, Thomas, West Bergholt, Colchester, Essex
 Donne, Rev. Stephen, Osvestry, Salop
 Dudding, Richard, Pantou, Wragby, Lincolnshire
 Edwards, Frederick, Frod Farm, Carmarthen
 Ellison, Lt.-Colonel, Boultham Hall, Lincoln
 Ewens, John Samuel, 4, Arthur-street West, London Bridge
 Freeman, Thomas, Henham, Wangford, Suffolk
 Frost, Charles, Wherstead, Ipswich, Suffolk
 Griffin, Frederick C., Methwold, Brandon, Norfolk
 Harrison, John, jun., Heaton-Norris, Stockport, Cheshire
 Hetherington, Robert, Manor House, Ropley, Alresford

Holborow, Daniel, Knockdown, Tetbury, Gloucestershire
 Herwood, Matthew, 2, Hatton Court, Threadneedle-st., London
 Hes, Daniel, Fairford, Gloucestershire
 Keywarth, Thomas M., Cottesford-place, Lincoln
 Kitson, William, Torquay, Devonshire
 Llewellyn, L., Trispenllwch, Swansea, Glamorgan
 Morris, George Kimond, Market-Rasen, Lincolnshire
 Parry, Thomas A., Bitham House, Banbury, Oxon
 Parton, John, Cow-lane, Newton, Manchester
 Prescott, Francis, Castle Farm, Dover, Kent
 Reeve, James, Randall's Farm, Leatherhead, Surrey
 Richardson, Robert, Appleby Castle, Westmoreland
 Roscoe, William, Ensbury, Wimbourn, Dorset
 Retton, Richard, Watford, Hertfordshire
 Ruddock, Joshua, The Terrace, Putney, Surrey
 Severn, Frederick, Lullington, Burton-on-Trent
 Simpson, Thomas, High Street, Lincoln
 Spencer, Edwin, Leominster, Herefordshire
 Thackeray, Captain, Faubourg St. Honoré, Paris
 Tovey, Robert, jun., Fairford, Gloucestershire
 Voelcker, Augustus, Phil. D. R. A. College, Cirencester
 Widdecombe, John, 7, Old Palace Yard, Westminster
 Worsley, Lord, Brocklesby Park, Uleceby, Lincolnshire.

The names of 34 candidates for election at the next monthly meeting were then read.

FINANCES.—Mr. Raymond Barker, chairman of the Finance Committee, read the report on the accounts of the Society; from which it appeared that the current cash-balance then in the hands of the bankers (including the Lincoln subscription) was £1,599.

REDUCTION OF EXPENDITURE.—Col. Chaloner reported progress on the part of the Reduction of Expenditure Committee, and obtained further time for the sitting of the committee.

LINCOLN MEETING.—The Hon. Leslie Melville, Vice-Chairman of the General Lincoln Committee, presented the report of that committee, which was postponed for further consideration.

PROTESTS.—On the motion of Mr. Thompson, seconded by Mr. Milward, the following resolution was passed:—"That it be an instruction to the stewards to endeavour if possible to decide all protests against the awards of the judges, at the country meeting, before the conclusion of the meetings; that such protests shall be delivered to the stewards, at the directors' office, in the show-yard, before 6 o'clock on the Thursday evening of the show-week; and that no protest shall be *subsequently* received, unless satisfactory reasons be assigned for the delay."

TRUSTEE.—On the motion of Mr. Fisher Hobbs, seconded by Mr. Thompson, Sir John Villiers Shelley, Bart., M.P., was elected one of the Trustees of the Society, to supply the vacancy created by the decease of the Hon. R. H. Clive.

GUANO SUPPLY.—On the motion of Mr. Fisher Hobbs, seconded by Mr. Woodward, the following special committee was appointed, for the purpose of taking into consideration the present position of the guano supply, and of offering to the Council any recommendation of measures to be taken by them in reference to that question—namely, the President, Duke of Richmond, Earl of March, Lord Berners, Sir John Shelley, M.P., Sir John Johnstone, M.P., Mr.

Bramston, M.P., Mr. E. Denison, M.P., Mr. Barrow, M.P., Col. Challoner, Mr. Raymond Barker, Mr. Thompson, Mr. Woodward, Mr. Lawrence, Mr. Caird, and Mr. Fisher Hobbs. The Council directed the Committee to be summoned for Wednesday next, and requested Mr. Fisher Hobbs to act as its Chairman.

IN-CALF HEIFERS, intended for exhibition at the Lincoln meeting, must be bulled before the 31st of March, and will only receive the prizes that may be awarded to them on that occasion, in the event of their producing live calves before the 31st of January next.

The Council adjourned to the 8th of March.

WEEKLY COUNCIL, March 8.—Mr. Pusey, President, in the chair.

OIL-CAKE.—Mr. Hudson, of Castleacre, transmitted to the Council the following communication, dated the 6th instant:—

I regret very much that I cannot attend the Council Meeting next Wednesday, in consequence of a business engagement, as I feel greatly interested in the discussion which I understand is to come on, on that day, upon the subject of the adulteration of Linseed-oil cakes by the English crushers. Having myself an oil-mill, and having made as much as 100 tons of cake in a season for my own use, I know something of cake-making; and I beg to differ with those gentlemen who stated, at the Council Meeting of the 8th of February, that the English cake was more adulterated than the foreign. As far as my experience goes, the contrary is the fact. I purchase my Linseed of Messrs. Webber and Hedge, of Lowestoft, who have a very extensive oil-mill there, with most beautiful machinery for cleaning the Linseed, and taking out almost every seed as well as dirt from it. This I cannot do in my small mill, not having the machinery for that purpose; therefore I prefer purchasing my Linseed of them, because I get it perfectly clean and free from wild Mustard and other bad seeds. I also purchase a considerable quantity of Linseed Cakes of them, knowing their cake to be pure, and free from noxious seeds; whereas, a great deal of the foreign cake is foul, and of very inferior quality.

Professor Simonds laid before the Council a variety of specimens furnished to him by Messrs. Webber and Hedge, of oil-cake manufactured by them, as well as samples of the seed from which the oil was expressed, and of the oil itself.—Mr. Capel Cure transmitted a specimen of oil-cake of very heterogeneous appearance, purchased by him as Ground-nut cake.—A discussion then ensued, in which the President, Mr. Fisher Hobbs, Mr. Woodward, Mr. Raymond Barker, Col. Hall, Prof. Simonds, Mr. Cuthbert Johnson, and Mr. Wrench took part, on the excellence of English oil-cake of high price, but of the inferiority of that of lower price, and the increasing adulterations taking place in these articles; on the evil arising from the practice of giving names to oil-cakes, which their composition and quality did not justify; on the competition among oil-pressers, leading to the employment of inferior seeds for crushing; on the pureness of the Linseed in France and America, for the expression of Linseed-oil, and the inferiority of the seeds and husk-refuse sent over to this country for purchase by oil-cake makers; on the numerous instances that oc-

curred of the death of animals feeding on these deleterious compounds (though termed "Linseed-cake" and "Rape-cake" in the market, where purchased); on the detection of these heterogeneous ingredients by means of microscopical investigation; on the President's continued use of Rape-cake (of pure quality) for sheep.

FOREIGN BARLEY.—Mr. Barnett, of Stratton Park, transmitted specimens of a foreign Barley, grown on his estate in Bedfordshire, along with the following memorandum:

Barley grown by Mr. Winters, Stratton Farm, Biggleswade, picked from a field sown with foreign Barley; yield greater than English Barley; but its best quality is that it decidedly is of superior weight and quality on clay land, compared with different sorts of Barley that have been tried on the same land. Of course, on real barley-land the quality is the best. Only a few ears were found in a field of many acres first sown with the foreign Barley, strong in the straw, and does not fall; requires to be cut before it is dead-ripe; has been malted, and proves of very good quality; not known where the foreign Barley came from.

Adjourned to March 15th.

WEEKLY MEETING, March 15.—Colonel CHALLONER, Trustee, in the chair.

A letter was read from Mr. Ellison, of Sizergh Castle, Westmoreland, conveying his 47 years' experience on the subject of "fingers-and-toes" in Turnips. As he had a great variety of soils on his farm, on none of which that excrescence had resulted until last year, he believed the nature of the soil to have but little, if any influence in that production. This exceptional piece of land was a 5-acre field of very bad limestone soil, which last year bore only a half crop; and which had failed, in Mr. Ellison's opinion, on account of the imperfect manner in which the seed had been steeped previously to sowing. He concludes his communication by stating the manner in which his steeping process was conducted, and his opinion of the good effects produced by the caustic urine on the seed by the destruction of any noxious germs it might be supposed to contain. He recommends the seed to be sown on the same day that it has been steeped, and that manured land should never be left unsown the same day that the manure is put into it.—The reading of this communication was followed by a discussion on the preparation of seeds for sowing; in which Colonel Challoner, Mr. Burke, Mr. Fisher Hobbs, Lord Camoys, Mr. Raymond Barker, Lord Lovaine, M.P., Colonel Hall, Mr. Bullen, Mr. Mainwaring Paine, and Mr. Wrench took part. The following were the principal points on which the discussion turned:—1. On the French steep for seed Wheat, of which a supply had been left some time ago at the Society's Rooms by Mr. Fisher Hobbs, for such members as might feel disposed to try it and report upon its effects. 2. On steeping Mangold Wurzel seed in manure water, in dry seasons; and on allowing it, according to the late Mr. Burness's method, to sprout before sowing. 3. On dibbling Mangold Wurzel seed. 4. On the application of river slime (from decomposed Reed), dug up near Tooting, and applied as a manure for

Mangold Wurzel, producing a crop of 7½ tons to the acre. 5. On the preparation of Carrot seed, and on the advantage of sowing it with a small hand drill on light soils, where the pressure of horses' feet would injure the texture of the land, and cause it to produce clubbed Carrots. 6. On the occurrence of excrescences in root crops grown on trodden gravel, or sandy soils; their absence on chalk and marl, even when trodden; and their disappearance on Mr. Paine's gravel or sandy soils in Surrey, on the application of marl. 7. On the prevalence of finger-and-toes in Berkshire and Northumberland, and on lime being successfully used in those counties as a specific for the disease in question.

The Rev. S. N. Kingdon addressed to the Council a letter on the stoppage of drains, by a substance which appeared to him to be common Couch-grass; and Mr. W. Taylor, on a proposal for the trial of a plan of Potato cultivation.—The Imperial and Central Agricultural Society of Paris, the Horticultural Society of Rouen, the New York State Agricultural Society, the Georgofili Academy of Florence, and the Imperial Agricultural Society of Vienna, presented copies of their respective Transactions; and the American Commissioners of Patents, copies of their reports connected with Agriculture and the Mechanical Arts; for which the best thanks of the Council were ordered.

Adjourned to March 22.

WEEKLY COUNCIL, March 22.—Mr. PUSEY, President, in the chair.

GELATINOUS AND SALINE MANURES.—Mr. Tuckett, of Looe, near Looe, in Cornwall, communicated the results of trials undertaken by him for the conversion of fish-offal into manure; and a statement of his mode of reducing animal substances, in the course of three hours, into a pulp or jelly, preparatory to its being diluted with water for the liquid-manure drill, or mixed with a fine powder for drilling with seeds. He also referred to the plan he employed for separating the chief manuring elements from gas-liquor, by saturating it with common salt, and then filtering it through a layer of powdered peat-charcoal, mixed with two-thirds its quantity of dried clay, ground. Mr. Tuckett at the same time offered a suggestion, that search should be made on the north coast of Africa, especially in Tunis, for deposits of the nitrates of potash and soda. He thought the present time was favourable for such inquiries in districts under the Mohammedan rule; and he cited various extracts from Dr. Shaw's travels in those regions, showing the natural fertility that had from time immemorial subsisted in certain districts, from no other apparent cause than that of the strong nitrous impregnation to which the soil was constantly subjected.—The President took that opportunity of communicating the following statement, transmitted to him by Mr. Dyce Nicol, to whom it had been addressed by that gentleman's overseer in Kincardineshire:—

"The land on which the following experiment was made was a peat bog reclaimed in 1850, thoroughly drained, and six inches of clay applied over the whole surface; the only crops raised upon it had been oats, turnips, and again oats sown out

with grass. In March last I sowed on one portion of the new grass 2 cwt. of nitrate of soda with 1 cwt. of salt; on another portion 1 cwt. of guano, and on the remainder of the field no manure was applied.

The nitrate gave per imperial acre 360 stons of hay,
 at 9d. per stone of 22lbs. £11 5 0
 Guano gave 270 stons, value 10 2 6
 Nothing gave 170 stons, value 5 5 0

Independently of the increase of weight of hay from nitrate, I prefer that manure for either new or old grass, as it appears to require little moisture to put it down to the roots of the plants. A strong dew in the course of one night appeared sufficient for that purpose, and in about thirty-six hours after its application the grass turned to a luxuriant dark green colour, whereas the guano requires a good shower of rain to put it down; unless it gets such fall of rain, it does little good. My trial of nitrate on oats and barley last year leads me to prefer guano for these crops. I applied 1½ cwt. of nitrate on one portion and 3 cwt. of guano on another, but the oats top-dressed with nitrate kept a bluish sort of colour throughout the season, and did not ripen equally, and the ear soft; while those which had guano ripened equally, had a harder, crisper ear, and weighed better. The land upon which that experiment was made had not been previously cropped, and was of a mossy loam with a mixture of clay."

MORTALITY AMONG LAMBS.—Communications were read from Mr. Dorrien, in Sussex, and Mr. Creswell, in Leicestershire, on the subject of mortality among their lambs. The case of Mr. Dorrien was considered to be an ordinary one, but that of Mr. Creswell new both to the shepherds and to Professor Simonds. The following statement was read from Mr. Creswell, and Professor Simonds was directed to inspect these lambs, and make a report upon the circumstances under which the mortality was taking place, and might in the best mode be prevented.

"Ravenstone, Ashby-de-la-Zouch, March 20, 1851.

"I have been sadly puzzled by my sucking lambs having sore mouths; the affection begins generally in the roof of the mouth and gums, and becomes so bad that the lambs will not suck, but in a few days die. I lost three in one night. My lambs are high-bred Leicesters, and of course are very valuable. In some instances the mother's udder catches the complaint, and I have lost one of them. I have tried alum and borax, but without any good result: I am now trying nitric acid, diluted with water. In a *post mortem* examination, we find the covering round the heart very much diseased, and the lungs partially so. Of course we drench the lambs with milk frequently, and I have dosed them all with castor oil."

This communication led to the expression of various opinions and results of experience on this subject, especial reference being made to the disease in the joints, arising to sheep pastured on the black blowing sands of Norfolk, especially about Thetford, after they had been recently marled.

The President, Prof. Simonds, Mr. Raymond Barker, Mr. Fisher Hobbs, Mr. Druce, Mr. Paine, Prof. Way, Mr. Cavendish, Sir John Johnstone, and Mr. Caird having expressed their opinions on the communications then made to the Council, Mr. Raymond Barker read a letter on adulteration of oil-cake, and Mr. Wrench a statement on the character of the mustard seed employed as a condiment in this country.

Adjourned to March 29.

AGRICULTURAL CHEMISTRY—QUERIES.
TO THE EDITOR OF THE FARMER'S MAGAZINE.

SIR,—I regularly read your excellent periodical; and, in making the following remarks, you must give me credit for a desire to endeavour to better the condition of the farmer, who, generally speaking, has no knowledge of chemistry, or of chemical terms.

In reading such articles as your first article in the March number, if the common farmer is ever so anxious to avail himself of the instruction therein given, and to benefit himself by following the example of Mr. Pusey and others, he is at a loss how to act. I allude to this article especially, because it is more easy to be understood than are many similar communications; nevertheless, when the farmer asks himself, What am I to do? he knows not how to proceed.

First of all, he is totally unacquainted with the names of the articles; and, secondly, it is seldom that the quantity is specified that he ought to apply; and, thirdly, the circumstances under which he is justified in applying them ought to be known to him.

It must be a long time before farmers can understand chemistry and chemical terms; and I doubt much whether it is advisable they should endeavour to learn, any more than that they should be taught the art of medicine, in order to doctor themselves: they will only become quacks, and may do a great deal of harm. How much better that really learned and scientific men should make experiments under the sanction of an eminent agriculturist—such as Mr. Pusey—and then convey the result of such experiments in a plain untechnical form, for the benefit of the ordinary farmer!

The plan you have adopted of admitting agricultural queries and supplying answers in your periodical, is calculated to do a large amount of good. May I then venture to ask you to bring before your readers the proposal that such a little work (price 6d. or 1s.) shall be got up? and, if well done, it would deserve the name of *the Farmer's Friend*. It might be arranged in four divisions: the nature of the soil and subsoil; the previous crop, and the manure put on; the crop you intend to have; the manure best adapted for it, and the quantity to be applied—all this expressed in as plain English as the subjects admit of.

The changes and variations involved are not so numerous but that they may readily be embraced in the compass of a book at the price I name; because I would have no reasons, nor disquisitions, nor explanations. The doctor sends me the medicine, and I take it; without making all manner of inquiry in regard to symptoms, component parts of the medicine, &c.

In conclusion, will you allow me to submit a few queries?

1st. A farmer has not fold-yard manure for his grass land (on a cold, strong, clay soil, drained). What will it be best for him to use for either pasture or meadow land, and the quantity? (To fulfil my conditions, the manure put on last year ought to be named).

2nd. On a similar soil. What kind and quality of hand-tillage is best adapted for turnips, in addition to 12 or 15 tons of good fold-yard manure? and how should it be used, drilled or broad-cast? The previous crop—wheat, oats, or flax.

3rd. What is the best top-dressing for wheat? The price of nitrates, sulphate of ammonia? Guano is so high, that if soot, rape-dust, lime and salt are applicable, they are much more economical.

Excuse this long communication,

And believe me yours respectfully,

H. S.

Thorner, near Leeds, March 15th, 1854.

COVERED HOMESTALLS.

The following letter from W. Fisher Hobbs, Esq., on the subject of covered homestalls, accompanied by engraved plans, appears in the number of the Journal of the Royal Agricultural Society just published:—

MY DEAR SIR,—Although we have published in our journals several plans of farm buildings within the last few years, yet I believe we have not noticed the "covered homestalls," which are by some approved of, and combine several advantages over those generally in use. At your request, I have enclosed with this letter a ground plan and specification of a covered homestall, together with isometrical drawings, showing the exterior elevation and internal arrangements of the same. This plan is suited to an occupation of 300 acres (two-thirds arable, and one-third grass), and has lately been built at the Klapp Farm, near Ledbury, a short distance from the Gloucester and Hereford turnpike-road, on the estate of the Earl Somers, and which, for cost of erection, general arrangement, regulation of temperature, and style of building, is, in my humble opinion, worthy of the consideration of landed proprietors and others who are concerned in the improvement of estates, or take an interest in the production of the soil.

I do not hold myself responsible for the estimates sent; they are drawn up by an able architect, Mr. Day, of Worcester, who has erected several covered homestalls upon the Easton estate and in the neighbourhood; and, from what I can ascertain, I believe his calculations are quite correct. For the purpose of comparison, Mr. Day has supplied me with specifications for ordinary farm-buildings, adapted for a farm of the same size. According to those calculations, it appears that a saving of fully £10 per cent. would be effected by the erection of covered homestalls; instead of farm-buildings of the ordinary character, besides having almost the entire control over the temperature of yards, which is of greater importance to the comfort and well-doing of the animals, and in the economy of their food, than we generally imagine.

The barn and granary are covered with a roof close boarded

and tiled, but the yards, stables, &c., are covered with the Bridgewater roof-tiles. These are, in my opinion, peculiarly adapted to the purpose. They are 14 inches square, and, when fixed, lap over 2 inches; consequently, 100 of them make 100 square feet of tiling. Each one (although a perfect security against rain or snow) acts as a ventilator, and therefore there is not that direct draft or current of air which is so objectionable where it only escapes through the sides or ends of buildings. This gradual ventilation prevents that accumulation of ammoniacal vapours which is so common in ordinary farm-buildings where animals are kept. Some other advantages which covered homesteads possess are, the convertibility of the yards into divisions adapted to different purposes at the several seasons of the year, or to the particular requirements of the occupier, as well as the saving of the expense of making liquid-manure tanks, and the superior quality of the manure in the covered yards to that of ordinary manure made in open yards.

The arrangements for the threshing are for a portable steam-engine and threshing-machine, but a fixed engine and barn-works can be put up when desirable. Whatever merit there may be in this particular plan for a covered homestead, it is mainly due to Mr. Oakley, the agent at Eastnor, under whose management several have been erected on the estate, of a superior character to any I have elsewhere seen.

I remain, dear sir, yours truly,

WM. FISHER HOBBS.

Boxed Lodge, Colchester.

The total of the estimates for homesteads, with open yards, is £1,166 16s. 11d.; those with covered homesteads, £1,052 15s. 4d.

MANAGEMENT OF EWES.

MR. EDITOR,—At this particular season, I know of few subjects more appropriate, or more worthy a place in your valuable columns, than a few remarks on the treatment and management of ewes before and after parturition. It cannot fail to be fresh in the memories of most—the unusual amount of fatalities that occurred to ewes during the last lambing season; many farmers in this locality being losers to the tune of from 5 to 20 per cent. of their whole flocks. To account for such an unusual occurrence, seems to me perfectly explicable, as I am inclined to believe that by proper treatment it never would have taken place; and no more mysterious a panacea for its total prevention would have been required than a liberal supply of nutritive food, combined with proper shelter during the protracted snowstorms.

In cold, stormy weather, animals of all grades require more food, in order that the body, suffering from the lowness of the temperature, may have an increased supply of carbon, by the conversion of which into carbonic acid the body is kept up to its natural warmth. If such a supply is not forthcoming, the consequences are emaciation of body, deterioration of wool, a host of diseases; and death itself is a concomitant usually attendant on such neglect. It is a mistake common among farmers that any refuse food will suffice for brood ewes during the winter months, such as turning them into a field noted for the coarseness of its herbage, and possessing so little nutrition that it will scarce fatten a sheep per acre during the summer months. Indeed, they seem to be of the same opinion as the Scotchman, who cared little for the quality or cleanliness of his food, provided he only had plenty of it. Now, I dissent entirely from this way of treating them; and I maintain that, if it pays to keep ewes at all, it pays to keep them well. From

the greatly increased and increasing consumption of annual food in this country, it is a duty incumbent on the farmer, for the general as well as his own individual interest, to produce the greatest amount of meat from the least quantity of food, and in the least possible time. For the furtherance of such an object, nothing is of so much importance as liberal treatment and care of the animal during the early stages of its existence. Unless a broad ewe is kept in an even, good condition, it is quite impossible she can either be healthy herself, or give milk to rear a healthful lamb. It certainly is not absolutely necessary that a ewe should be so fat as to be what is called "cloven above the tail;" but the nearer she approaches that state, the better.

I beg to give a short account of the way in which my flock, consisting of 100 ewes, are managed. The tupps are put to in the first week of October, two being quite sufficient to serve 100 ewes. Before and during the time the tups are among them, they are liberally supplied with turnips, in addition to their grass. It is of the highest importance to have them in a mending condition at that time; and the increased fall of lambs well pays for all extra food given.

When all are served, and by which time the grass begins to fail, they have a supply of tops and small turnips daily, to keep them in their good condition, until within a short time of lambing, when a more liberal supply is given.

During the snowstorm last year, they had a feed of swedes daily, care being taken not to give more at once than was consumed in one day; a supply of hay, and one pint of bruised oats, to each sheep, per diem; a supply of salt (which they have all the year round), *ad libitum*. By such treatment they were kept in a healthy, thriving condition; and not the death of one ewe occurred in the flock. For 100 ewes, I have at this date 131 hogs, now fattening on turnips, cut and put in troughs. Some of them are fat now. I expect they will all be so by the beginning of May, at which time they will average 72lbs. of mutton each sheep. They are the Bakewell Leicester breed. I consider, if a little of the Cheriot blood could be introduced, they would be all the better for it.

Now, when I contrast some of the statements made by my neighbours, I am fully convinced that my exemption from the fatality was wholly and entirely owing to the liberal way in which my flock was fed.

Should you think my remarks may be of any use in your highly useful Journal, I will feel much obliged by their insertion, and I beg to remain,

Mr. Editor, yours, &c.,

M.

BELL'S REAPING MACHINE.

In the "Journal of Agriculture" for January, 1854, is published an elaborate article on this machine by its inventor, the Rev. Patrick Bell, of Carmylie, Forfarshire. It contains a highly entertaining account of the origin and progress of the machine, and is written in a very temperate and becoming spirit. We have but little complaint to make of the paper, and yet cannot honestly allow it to pass unnoticed; for the mildness of the reverend gentleman's remarks is sometimes, we apprehend, calculated to conceal their real purpose, and the conclusions to which they are virtually intended to lead. For instance, several pages are taken up by a discussion which obviously is intended to convey the impression that the American reaping machines are all modifications of, or were suggested by, the author's. In the early part of this discussion the following sentiments are introduced:

"Nevertheless, however, although not the first, the Ameri-

cans may be inventors of the reaping machine, because, at the time of their inventions, they may not have had any knowledge of the principles and details of my reaping machine. Almost in every department instances are on record of parties independently, and without knowledge of each other's movements, making the same discovery."

This is doubtless perfectly true, and has at least the appearance of liberality and candour.

From this article we gather that he considers himself as the inventor of the following three features of his machine:—1. The reel; 2. the scissors or shears; and, 3. the travelling canvass. All of these he claims having invented and combined in 1828. Let us first, then, turn to the invention of the reel, and we find this extraordinary fact—that in the *Mechanics' Magazine* for 1825, there is a full description of a reaping-machine invented by Mr. Henry Ogle, of Rennington, Northumberland, in which the reel was focused and employed in exactly the same way as in Mr. Bell's machine. It is also important to know that the *Mechanics' Magazine* was at that time largely circulated in Scotland, and that the description of Mr. Ogle's machine attracted considerable attention at the time of its publication, as well as subsequently, both in that and in this country. Again, the use of scissors or shears, for reaping purposes, dates as far back, at least, as the year 1807, at which time a reaping-machine was invented by Mr. Salmon of which they formed the most conspicuous portion. And this invention was described first in the *Farmers' Dictionary*, and subsequently in *London's Encyclopædia of Agriculture*. According to Mr. Bell's process of reasoning, we are led unavoidably to the following conclusion:—"That every honest and impartial inquirer will be satisfied that Bell's reaper, in two out of the three of its principal features, is a mere copy of Salmon's shears and Ogle's reel." This is not our own opinion. We willingly give the reverend gentleman full credit for veracity in his narration of the manner in which he was led, first philanthropically to seek to construct a machine which should diminish the toil of the labourer; and, secondly, ingeniously to arrange and combine the parts of his reaper which has proved so successful. We desire, however, that he should cede to others the indulgence that he evidently so much needs for himself.—*Mechanics' Magazine*.

CORN RENTS.

At a meeting of the *Probus Farmers' Club*, held on Saturday, the 11th March, the subject of "Corn Rents" was introduced by one of its members for the purpose of discussion.

"The subject of leases," he said, "had often been discussed by the members of this club, and new forms of leases had been recommended, but always with a fixed monied rental. The late depression in the agricultural world has clearly shown how very injurious it is to those farmers who hold their estates under such a system; not only is it injurious to the tenant, but also to the landlord. Most tenant farmers for the last three years have been obliged to throw themselves on the generosity of their respective lords for a reduction of rent; which they have obtained, he believed, in most places, varying from five to twenty per cent. on their rentals, and even with this it is well known that many have been obliged to leave their estates, and seek their fortunes in another country; and others again have reduced their farms to such a state of poverty that the effects of the present high prices will be scarcely felt by them." He recommended the members to consider well the great advan-

tages offered by a system of corn rents. "I have no doubt," he said, "there are some things in this system objectionable, and like every new invention, will be considered by the old class of farmers as an infringement of their rights, and treated accordingly. Such was the case in Scotland where it was first introduced many years since, and it was a very long period before any person could be induced to depart from the system of their forefathers; at last, one man bolder than the others had the audacity to break the ice. He very soon found out its advantages, and recommended it to his fellow farmers. This coming from one of their own class it began to gain ground, and now there is scarcely a farm in the Lothians let at a fixed monied rental." There are many forms of a corn rent, but the one he recommended is the following:—"If either of us should take an estate when wheat is £1 per bushel, we should give for that estate £100 per annum, or in fact I give 100 bushels of wheat per year; but instead of that being a fixed monied rental, the rental should be governed by the average price of wheat for that year, the average being taken at Mark Lane, or any other place. The rental of the farm would under this system vary very considerably. Supposing you took the farm in 1849 when wheat for that year averaged £1 per bushel, you would pay for that year £100. In 1850 the average price of wheat at Mark Lane was £2 per quarter, 15s. the Cornish bushel; the rental would be £75, or 25 per cent. less, which I believe to be more than any lord in Cornwall ever gave. In 1851 the average price of wheat at Mark Lane was 38s. 8d.; the Cornish bushel, 13s. 6d. The rental would then be £67 10s., nearly 35 per cent. less. In 1852 the average price of wheat was 40s. 9d. per quarter, about 15s. 3d. the Cornish bushel. The rental would then be £76 5s., nearly 24 per cent. less. In 1853 the price of wheat at Mark Lane was 53s. 3d. per quarter, or nearly £1 per bushel, and the rental of course would be £100. Supposing the average price of corn this year should be at Mark Lane 80s. per quarter, 30s. the Cornish bushel, the rental would be £150. We all know," he said, "that the price of wheat is at times high, when few farmers have any to sell, thus making an unfair average; and at other times again it is the contrary, making the average too low. There should be therefore a maximum and a minimum point, one for the protection of the farmer, and the other for the protection of the lord. Say the maximum to be 25s. the bushel and the minimum 15s. the bushel, so that his rent could not be more than £125 per annum or less than £75, 25 per cent. on both sides. This would protect the farmer against any unusually high average of corn, and the lord against any unusually low one." The lecturer showed that by the system of corn rents we should bring the landlord and tenant much nearer together; in fact they would be rowing together in the same boat, so that if one sinks the other must go with him; and he had no doubt more good feeling would exist than at present. This is the position which he wished to see carried out. Not only would the lord and tenant be benefited as to pecuniary matters, but an impetus would be given for the improvement of farms in every respect. If he agrees to give his landlord 100 bushels of wheat per annum, and by superior cultivation grow 150, so much the greater would be his profits. This is only one instance, but many more may be cited if necessary.

A long and interesting discussion ensued, and the club came to the following resolution:—"That it was their opinion, a corn rent, at a fair value of the land, with a maximum of 60s. the quarter, and a minimum of 40s. the quarter for wheat, would be advantageous both to landlord and tenant."

LINSEED-CAKE AND BRAN.

SIR,—Having for some years been used to the linseed and corn crushing business, I think it right that the public should be spared the trouble of spreading reports which are not only absurd, but untrue. I have tried various experiments to reduce the expenses of milling, and I can truly state that bran cannot be used to advantage, which is worth £7 per ton, and linseed cake £11 per ton here. If your correspondent can mix bran with linseed without absorbing the valuable properties of the seed-oil, I shall be glad to know his system of managing it. Linseed oil is now too dear to waste, being three times the value of the cake per ton; and I think no crusher, of common sense, would mix any class of adulterating stuff, to reduce the quantity of oil merely for the sake of making a greater quantity of cake. Linseed cake is the offal of linseed, as bran is of wheat. There is no doubt a good deal of old, as well as foreign cake worked over again, which may render it short and crumbly, presenting much the appearance that Mr. Rowley states; but of course, if he is a great consumer of linseed cake, he will object to and refrain from purchasing such quality in future, although it may probably be quite as good as the other cake made from fresh seed alone.

With regard to mixing bran with rape cake, he says, it is not an adulteration because it is the same price per ton. Now I really do not understand his meaning of adulteration. I have always been informed, and shall be inclined to believe, that all articles different to a genuine article, must be called adulterated.

Rape oil is now worth about seven times the value of rape cake per ton, and I really cannot think the gentleman can find any seed crusher so foolish as to mix bran with his seed, and absorb a great portion of the valuable oil; neither do I think any person would take the trouble to work his rape cake over again, and mix bran with it to make a greater quantity when there would be great additional expenses in working it; bran being no cheaper, but at least £1 per ton dearer than cake before it is used; and as I have before asked, where are the adhesive qualities to combine them, when the oil is once extracted?

If the gentleman would turn his attention to machinery, for the benefit of his brother farmers, I will suggest the best and cheapest use of cake made from the refuse of starch, viz., starch, bran, slimes, &c., &c., which would cost probably about £9 per ton: its valuable properties are generally appreciated by those who have had their beasts, pigs, &c., fed at the various starch works in Nottinghamshire.

I am, Sir, yours &c.

Nottingham, Feb. 1st.

A CRUSHER.

AGRICULTURAL STATISTICS.

Sir,—If nothing else could convince the agricultural portion of our population of the value of accurate agricultural statistics to themselves, as well as to the community generally, surely the fact that corn has fluctuated *cent.* per cent. in price in three years out of seven would be sufficient. In 1847 a deficient yield of wheat, with a potato failure, sent wheat from 48s. to 120s. per qr. in a very few months. In 1852 a deficient barley crop advanced that grain from 21s. to 40s. per quarter. Again, in 1853, from a small breadth sown, as well as an indifferent yield, wheat advanced from 40s. to 85s. per quarter; and yet few or none of the farmers knew of this, and sold at frightful losses in the early part of each of those seasons to the French, who knew things better.

Yes, parties interested know the French have a system of

agricultural statistics, unsuited perhaps to the English mind; and in the autumn of 1846, and again in the autumn of 1853, they were buying in our markets before the English farmers had any idea of any price beyond 45s. per quarter being obtained.

Now, our large corn merchants and our maltsters get this information by special agents, sent out at a great expense to them as individuals, and many of the great firms knew well that in 1847, and again in 1853, prices of wheat would rule high, and, in 1852, that prices of barley would double.

Now, why should not the nation and the farmers know as much as the French, or as the corn-merchants and maltsters, and so provide for a season of scarcity?

Now, a measure to secure this may be popular or unpopular just in proportion as it is well or ill contrived. It must not be inquisitorial—it must be efficient. To be efficient it must not only give the area of cultivated crops, but it must give the acreage produce. The area may easily be obtained: experience has shown it will not be objected to. But ask the farmers for their yield, and they will rise against it to a man, from John o'Great's to Land's-end. And yet, if we do not obtain this, we get nothing of any value.

But it may be obtained accurately, and simply, and free from all objection, from the farmers. It was obtained every year on thousands of acres, when the tithe was let from year to year. It is now obtained on thousands in the case of off-going tenants. The acreage obtained, with the Ordnance map, a valuation a month before harvest, will give an average estimate of the yield to a trifle. The overseers will give the acreage, a very little calculation will give it, and thus the resources of the nation may be known in a fortnight.

Your most obedient servant,

MATTHEW M. MILBURN.

Thirsk, Yorkshire, March 17.

CONDITIONS OF FARM SALES IN LANCASHIRE.—LIABILITY OF A GUARANTEE IN SIGNING SALE-BOOK.

COUNTY COURT, LANCASTER, Feb. 25.

Mr. Saul, of Garstang, has kindly given us the following of this case:—

GILLOW V. WILDMAN AND WILSON.

Messrs. Gillow, farmers, sought to recover from Mr. Wilson the sum of £11 10s. Mr. Sharp appeared for the plaintiff and Mr. Clark for the defendant Wilson. Mr. Sharp stated the case. His clients had a sale by auction of their stock previous to removing to another farm, which was a usual thing, and Wildman purchased a cow at the sale, but was not allowed to remove it from the premises, until he found some person who would be answerable for its payment, by signing along with him in the sale-book. This was a rule when the purchaser alone would not be credited. The conditions of the sale were drawn up by Mr. E. Garner, the parish-clerk and schoolmaster of Holton, near Lancaster, and who has had much experience in those matters, and who also acted as the clerk at the sale; the conditions stated that a person signing his name under the person who should be the last bidder should be considered a joint purchaser. Wildman was considered a doubtful party, and was not allowed to remove the cow until he brought a responsible person to sign the book; he then prevailed on Wilson, a respectable farmer, to sign with him, and Wildman having failed to pay at the appointed time, his clients now sought to recover the money from Mr. Wilson.

Mr. Clark contended that his client was not responsible,

unless it could be proved he was present when the conditions were read, and that the signing was merely as a security, and in that case the document was void, because of the absence of a stamp.

His Honour observed that the conditions were new to him. He would consider the case, and give his judgment next court-day.

On the 4th instant, in giving judgment, his Honour said the conditions of sale contained an unusual clause; he had never seen such a one before. It had been stated in the hearing of the case that it was a piece of ingenuity on the part of the parish-clerk; but his opinion was that it had been framed by a more learned man. It was not a guarantee, but a contract, originally by one, but became a contract and revision by two. It was not necessary that it should be stamped, as it related to goods, wares, and merchandize. It was not a guarantee, but an original contract between them both. The defendant was therefore liable. Order accordingly made for the money to be paid in a fortnight, and the costs, &c.

AGRICULTURAL QUERIES.

SIR,—Can any of your numerous readers inform me if guano and bones mixed have ever been used for turnips? If so, in what quantities, and what was the result? The insertion of this in your most valuable paper will oblige,

A SUBSCRIBER.

SIR,—Shall feel obliged if any of your readers will give some information on the following subject:—After depositing the manure in the drill for turnips, I usually apply bone-dust on the manure, and close the drill. An idea has struck me, whether it would be prudent (in a chemical point of view) to intermix the dust and manure well together, say a fortnight previous to application. My own opinion is, the dust would be made more easily soluble; consequently more readily assimilated by the turnips.

A FARMER.

SIR,—Will you be so good as to invite your correspondents to give a struggling farmer their best advice how best to rid himself of couch, *alias* twitch, which has struck its roots considerably below the nine-inch-deep furrow, into the airy clay beneath?

Such advice would confer a great boon upon

Your obedient servant,

Shaftesbury, March 4.

S. W.

SIR,—Having some grass-land to which bulky and heavy manure cannot be conveyed but with great expense and difficulty, I shall feel greatly obliged if some practical gentleman will, through the medium of your valuable journal, state what kind of artificial dressing, with the mode of application, he would deem best to secure an important improvement. The soil is light, and rather thin, lying on a bed of gravel, supported in many places by stiff clay.

I am, sir, yours respectfully,

A LANDHOLDER AND SUBSCRIBER.

A constant reader of your valuable journal is anxious to grow some lucerne. As I am occupying about 250 acres of land, with only 16 acres of grass, would any practical grower of lucerne give me his opinion respecting it as food for working horses, and how to prepare a piece of land so as to be most likely to ensure a good crop, also the time of sowing, quantity of seed, with treatment afterwards? The plot I intend sowing is a free loam; good depth of soil. I have just drawn a crop of turnips off; sown on tare stubble, mown off for horses.

C. M. H.

SIR,—Can you, or any of your readers, inform me which of the States is the best field for sheep-farming in America? and oblige your obedient servant,

Edinburgh, March 21.

CHEVIOT.

[Something depends upon the kind of sheep to be kept; but

Pennsylvania, especially the highland part of it, is the best for Cheviots. Very important improvements have lately been made, in the northern states, in the management of sheep.—W. B.]

ANSWERS TO AGRICULTURAL QUERIES.

LUCERNE.

"C. M. H."—Lucerne is a very valuable crop for working horses; and, on soils where it is suitable, a very productive crop. It never answers so well, however, as on limestone land; and if our correspondent's soil is not limestone, he will have to use mountain lime in large quantities to be successful. It may be drilled with the barley in alternate rows, at the rate of 15 lbs. of seed per acre. It will cut the next year; and if a good compost dressing is given in the spring following, it will repay it. It must be kept very clean, and constantly hand and horse-hoed. Drills nine inches apart.

In answer to "C. M. H.'s" question as to the quality and cultivation of lucerne, I know of nothing that answers so well for food for working horses and cows, if the soil and attention to it be such as it demands. Hog pigs do well upon it fresh cut, but for horses I should recommend it to be nearly half made into hay. It requires a deep and good soil, for if the tap-root reaches water, the plant dies immediately. The land should be well worked with both plough and harrows, and well manured, and made as fine and clean as well can be. Sow the middle of April; not sooner, for fear of the May frosts, which often destroy the young plants. Sow in rows from 12 to 18 inches. I sow 16 inches apart, and that is the distance I would recommend. About 12 lbs. of seed per acre. In all cases it must be kept clean from weeds. I invariably hoe between the rows after every mowing. Give it a good dressing of manure every spring (March); work it well with your harrows, which will not injure it; harrow and cross-harrow it over and over. One great property is its quick growth; I have cut it four or five times in one summer, and, if kept clean, it will stand for years. I have known it grow 14 inches in 16 days. Its great advantage over other grasses is, that in very long, dry, hot summers you do not perceive any visible check. I once ploughed a piece up, and was surprised to find some of the roots draw up three or four feet long, and all struck directly downwards.

J. W.

ROT IN SHEEP.

SIR.—In answer to "G. G.'s" question, if they are very forward with lamb I should delay treating them, but if about a month distant from lambing, there will be no risk.

A SUBSCRIBER.

GYPSUM AT THE BOTTOM OF WELLS.

"George Arnold."—Gypsum will dissolve in 500 times its weight of water, and hence 50 gallons of water will dissolve a pound of gypsum. Vegetable matter in the well in any quantity will dissolve it, and give the water a slightly sulphurous character.

AGE OF HOGS.

"A small Farmer."—The tusks develop a little different in different breeds. Usually they will begin to form at nine months, and to appear externally in both bears and sows at one year old. We are not aware there is any difference between hogs and sows in this particular, but castrated pigs are larger than entire.

BONE DUST WITH DUNG.

There can be little doubt that working the bone-dust with the dung would make it more soluble in the weak acids of the soil and plant, but at the expense of ammonia, which, without due precautions, would exhale into the air. Mr. Pusey's method of working the bone-dust with three or four times its bulk of damp sawdust, soda, earth, or sand, is more economical, easier, and probably more effective. The bone is mixed with one-half the sawdust, &c.; the other half laid over the heap as a cover, to keep in the ammonia. When turned up after two or three weeks, it smells strongly; but on mixing in the covering part, this is quickly absorbed. This mixture may be either

mixed with the dung just before using, or probably in most cases better applied afterwards. It possesses most of the properties of guano. J. PRIDEAUX.

GUANO AND BONES.

"A Subscriber."—These may safely and profitably be used for turnips, though dissolved bones would be preferable. 2 cwt. of Peruvian guano and 4 bushels of dissolved or 8 bushels of raw half-inch bones would be a sufficient dressing on land where the mixture had not been applied before.

STR.—Having ever since I began farming derived advantage and instruction from the pages of the *Mark Lane Express*, I shall now have great pleasure in sometimes sending, when my own experience enables me to do so, replies to the agricultural queries I see in that paper. My plan with the paper is this—I read it and file it, and a reference to this file I find very useful in the commercial part of farm business (*i. e.*, for years past to see how prices usually vary with circumstances). I mention this because every young farmer, I am persuaded, would find great benefit in doing the same, and in getting also all the little treatises he sees there recommended, particularly those of Johnson; and because also, if the writer of the second query in the *M. L. E.* of the 15th inst. had been in the habit of doing so, it would have saved him the trouble of writing that letter, and he would have acquired in addition a great deal of valuable information on the subject of the improvement of grass land in the course of last year.

The best advice that can be given to writers of queries of the sort to which I am first going to attempt a short reply is, to read all that has been lately written on the subjects respectively, and then to go to the nearest old farmer for facts, and then to use their own judgment; for this reason, that farming is not yet, unfortunately, reduced to a science, and therefore there are few universally known technical terms, and therefore such questions put in one district cannot be definitely understood in another, nor, *mutatis mutandis*, can the answer be understood. For instance, it is impossible for me to know exactly what "S. W." means by "airy clay nine inches below the surface." I should suppose that the land wants draining terribly; and if it had been well drained last winter, there is a

better season for cleaning it now than has been known for a long time. I should say drain the land; it is not worth cleaning till it is drained, and then never grow a corn crop till it is clean. I have cleaned the foulest land I ever saw in my life very easily by taking two successive crops of turnips, eating the first off with sheep, and half the second, and, of course, often scuffling between the rows. And if you have unfortunately *Triticum repens*—we call it "wicks" in Yorkshire—in a corn crop, plough it up directly after harvest; and if you have them in a seed field, plough up and sow with rape; they grow very late in the year, and wicks are very useful if you have some good crops. I have had six or seven large crops off the land before turnip sowing, and I burn them altogether in a heap, covered well in with turf, and mix the ash with super-phosphate to drill in with the turnips, or cart them to bottom fold-yards with, or to make beds for manure heaps.

It is equally impossible to understand or answer the second query, which regards the permanent improvement of grass land, and the answer here would vary according to 500 or 600 circumstances, and their combinations, and, amongst others, to the meaning attached to the word permanent. Bones are very useful on some lands, especially, amongst others, land long fed off by cows, and their effects may last twenty years. I have seen the effect of 3 or 4 cwt. of guano per acre five years after its application, and I believe guano is the best general mixed manure. Sow 3 or 4 cwt. when the grass is wet and just before it begins to grow. I suppose by bulky manure fold-yard manure is meant. Whatever amount of it I had, I should never apply any of it to new grass land, or any where else, as a top dressing, or any common bulky manure, unless it was sand with meal upon it. Liquid manure I find most excellent, applied at all seasons when the grass is wet; and it is improved very much by dissolving the lumps of guano which are left, after riddling it for turnips, in sulphuric acid, and adding it in small quantities, and so saving the labour of breaking them. I have found a Crosskill's clover-ensher very useful on mossy land, and there is nothing better than feeding sheep on it with cake. It would be very easy to fill all this paper with merely mentioning different plans of improving grass land, and I regret very much to have transgressed so much on your patience and space, and hardly entered upon a subject which is very interesting to me.

R. F.

CALENDAR OF AGRICULTURE.

The sowing of grains, as oats and barley, is now finished, and also of flax and lucerne. Sow grass seeds on wheat and barley with the broadest sowing machine, and cover with light harrows and a heavy roll. Sow vetches for the second succession of crop. Top-dress young grains and grasses, and shut up grass and hay grounds.

Plant potatoes in drills on lands well wrought and dunged. Sow mangel wurzel on lands similarly prepared. Steep the seeds in suds or lees for 48 hours, and dry with quicklime. Use good half-rotted dung, and apply it liberally. The two crops now mentioned require a very ample allowance of farm-yard dung. Begin the burning of pared lands, which should be pared during winter, or must be done quickly now; lay the turfs in heaps, and burn moderately, in order to avoid calcination.

Horse and hand hoe all drilled crops, as oats, barley, beans, peas, lucerne, and carrots if ready. Burn for ashes, as manure, peats and all refuse earthy substances, to be applied by the drop drill.

Fold the sheep, ewes, and lambs on early vetches, winter barley, rye, and watered meadows; or cut the food, and give it to them in racks. Confine the animals at night in a fold, and allow two square

yards of space to each animal, and two nights in one place. Cutting the food may be the most economical method.

The long days will now require more food for all animals on the farm; feed the cows with steamed food, roots, and chaff; bullocks with swedes and beet; and young stock with the same in a less quantity. Give the oldest calves some of the earliest green food, to teach them to live without milk; use also bruised cake, bruised linseed, and bean and barley meals.

Lambing will be finished this month. Put the oldest lambs on clovers as they get strong; cut turnips and beet into slices, and give them in troughs, mixed with oats, and bruised oil-cake. Spare no trouble nor expense with young animals.

Fat and aged cattle must now be all sold from the winter stall, bacon hogs much be cleared off, and the young farrows must go on for summer stores and for early fattening next winter. The earliest lambs will now be for sale as fat.

Begin to plough turnip fallows, and also clays, at convenient times; carry to the heaps all dungs remaining about the homestead, and litter the yards afresh.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEAT'R.
1854.			Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Feb. 21	30.22	30.22	34	52	39	N. East	gentle	fine	sun	fine	dry
22	30.29	29.99	35	45	44	S. West	lively	cloudy	cloudy	cloudy	rain
23	30.28	30.57	35	50	36	N. West	lively	fine	sun	fine	dry
24	30.53	30.30	33	46	45	W.S.W.	rising	fine	fine	cloudy	rain
25	30.37	30.46	39	53	40	N. West	lively	fine	sun	fine	dry
26	30.51	30.55	31	52	35	W.N.W.	gentle	fine	sun	fine	dry
27	30.44	30.33	32	52	40	W.S.W.	lively	cloudy	sun	fine	dry
28	30.30	30.57	37	54	35	W. by North	lively	fine	sun	fine	dry
Mar. 1	30.68	30.69	26	56	37	S. by East	gentle	clear	sun	fine	dry
2	30.69	30.66	28	58	35	S. by East	gentle	clear	sun	fine	dry
3	30.65	30.60	27	57	35	E. by North	gentle	clear	sun	fine	dry
4	30.67	30.73	27	49	40	N. Easterly	brisk	cloudy	cloudy	cloudy	dry
5	30.73	30.62	35	54	31	N. East	airy	fine	sun	fine	dry
6	30.51	30.44	25	45	32	Ely. & N.W.	gentle	fog	hazy	fine	dry
7	30.44	30.40	25	45	43	West by South	lively	haze	cloudy	cloudy	dry
8	30.35	29.34	42	52	49	West by South	lively	cloudy	fine	fine	dry
9	30.31	30.27	48	60	54	West by South	fresh	cloudy	fine	fine	dry
10	30.12	30.15	49	52	47	W. and by N.	brisk	cloudy	cloudy	fine	rain
11	30.18	30.17	47	59	45	S. West	lively	cloudy	sun	fine	dry
12	30.08	29.98	49	61	50	South	gentle	fine	sun	fine	dry
13	29.98	29.90	44	62	50	S. Westerly	gentle	fine	sun	fine	dry
14	29.90	30.04	43	54	46	W. and by N.	lively	cloudy	cloudy	cloudy	rain
15	30.18	30.18	37	57	48	S. West	lively	fine	sun	fine	dry
16	30.13	30.25	38	56	43	W. & W. by S.	lively	cloudy	sun	fine	rain
17	30.40	30.36	31	53	34	N. Westerly	gentle	fine	sun	fine	dry
18	30.20	30.00	31	45	39	W.S.W.	gentle	cloudy	cloudy	cloudy	rain
19	29.93	30.10	31	45	35	W. and East	strong	cloudy	cloudy	cloudy	rain
20	30.22	33.33	32	42	38	E. by North	brisk	cloudy	cloudy	cloudy	dry
21	30.33	30.38	35	52	37½	E.N.E.	lively	cloudy	sun	clear	dry
22	30.50	30.40	30	51	43	Northerly	lively	cloudy	cloudy	cloudy	

ESTIMATED AVERAGES OF MARCH.

Barometer.			Thermom't.		
High.	Low.	Mean.	High.	Low.	Mean.
30.70	28.87	29.785	66	24	43.9

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
52.3	35.03	43.66

Omissions by oversight in the last Diary (February, p. 274) are thus supplied:—

1854.	Barometer.		Thermometer.		
	8 a.m.	10 p.m.	Min.	Max.	10 p.m.
Feb. 20. . .	30.0	29.91	33	50	45

ESTIMATED AVERAGES.

Highest.	Lowest.	Mean.
30.82	29.171	30.007

WEATHER AND PHENOMENA.

Feb. 21. Fine, after a hint of rain. 22. Changeable, overcast. 23. Overnight, rain. 24. Hint of rain, chilly, watery wind. 25. Beauty airy day. 26. Early frost; fine. 27. Beautiful cirri on a blue sky, about noon. 28. Very glorious sunset.

LUNATION.—New Moon, 27th day, 4 h. 30 m. morning.

March 1. Hoar frost; deep orange sunset. 2

and 3. Superb. 4. Overcast, chilly. 5. Beautiful. 6. Some sun; much dry haze; hazy and early frost, causing much drip from all trees. 8. Sober, mild day. 9. Broken dry clouds. 10. Windy and rainy noon. 11, 12, and 13. Superb; fine-coloured sunsets. 14. Overcast, and a sprinkle. 15. Some threatening and transitory clouds. 16. Some clouds; fine P.M. 17. Rime. 18. Clouds, and a smart sprinkle. 19. Sudden change at noon; fierce east wind, and a cold shower. 20. East current; sun at noon; *Equinox* after 10 P.M. 21. Airy, with a fine atmosphere; perfectly auspicious; equinox confirmed. 22. Gloomy, overcast, and cold.

LUNATIONS.—First quarter, 6th day, 7h. 16m. afternoon; full moon, 14th day, 5h. 53m. afternoon; last quarter, 21st day, 6h. 2m. afternoon.

REMARKS CONNECTED WITH AGRICULTURE.—The astonishing fineness of the weather will be at once apparent, and to the 17th of March only 5-100ths of an inch of rain had fallen, by the Lewisham tables. So fine a seeding has not been witnessed since the cold winter of 1847, which was then followed by a magnificent harvest. Let us trust for a similar blessing! A change seems to approach now.

J. TOWERS.

Croydon.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MARCH.

Notwithstanding that we have experienced some rather sharp frosts, the weather of the month just concluded has been seasonably fine. In all parts of the country, therefore, great progress has been made in ploughing and sowing; whilst the greater portion of the Lent corn has been deposited, with the land in excellent condition for the reception of the seed. We may observe that since about the middle of last September nothing has occurred to put a stop to farm labours, beyond the generally anticipated severe atmosphere during the actual winter months, but for which farmers in general were prepared. Prior to the middle of December, most of the winter wheats had been sown; and the rapid improvement in the value of grain both here and on the continent, and the prospect of a further advance in the quotations—which advance has since taken place—were productive of corresponding exertions on the part of the agricultural body. The result was that an unusually large breadth of land was sown with wheat. The increase, compared with the ordinary run of years, was certainly one-third; and compared with the autumn of 1852—in which period the falling off was a most serious one, and which unquestionably told upon the total growth of 1853—it amounted to one-half. The increase has continued up to the present time in the same ratio; in other words, we may observe that we have now the largest quantity of land under wheat tillage ever known. This is a most important and gratifying fact, and which must in the long run—at least, should we be favoured with an average acreable yield—have considerable influence upon prices towards the end of the present year. That the stock of wheat now held by our growers in the whole of our agricultural counties is unusually small for the time of year, is generally admitted, and by the period of harvest work the greater portion will be consumed; consequently, the new crop will be immediately brought into use, and our immense consumption will speedily clear off anything in the shape of surplus produce. It appears, therefore—and especially when the unfavourable state of affairs abroad are taken into consideration—that a low range of value ought not to be looked forward to. The commencement of hostilities with Russia will, of course, cut off the greater portion of our usual supplies of wheat and oats, including other produce, from the Russian ports; nevertheless, we are

decidedly of opinion that anything approaching scarcity need not be apprehended.

The immense imports of foreign wheat and flour into the United Kingdom during the month have produced much inactivity in the trade for those articles, and prices have fallen to some extent. The supplies held on the continent, as well as in the United States, have been greatly understated by many parties connected with the import trade; and it is evident that very great exertions will be made in the Baltic, up to the latest period, to bring away all the produce that can possibly be shipped prior to the commencement of hostilities; hence we may look for heavy supplies from that quarter during the first fortnight or three weeks of April. Our merchants and others have by this time learnt that produce in neutral ships, and shipped from neutral ports, will be respected by our cruisers; consequently, all grain vessels touching at Falmouth and elsewhere, unless they should be under Russian colours, are not liable to seizure, even though they may have cleared out at Odessa. Very extensive supplies of both English and foreign barley have come forward. Although the transactions have been good, prices have given way from 2s. to 4s. per quarter. All other spring corn, including flour, has fallen to some extent.

On the whole, very extensive supplies of potatoes have come forward, though in but middling condition. From Ireland, the receipts have been good; from Scotland, large; from abroad, only moderate. The demand has nearly kept pace with the arrivals, yet prices have had a downward tendency. The stocks yet on hand are represented as tolerably good.

The wool trade, since the conclusion of the public sales of colonial, has been in a very inactive state. With the exception of fine English qualities commanding extreme rates, arising from limited supplies, the value of most kinds has ruled rather in favour of buyers. The imports, this year, from Australia and other quarters, have nearly doubled those in the corresponding period in 1853; and the stock on hand is rather extensive.

The arrivals of guano from Peru have fallen considerably below the demand; indeed, orders for several thousand tons are yet unfulfilled. In first hands there is no stock; and the small quantities offering elsewhere have realized very high rates. The quantity on passage to England is supposed to

be small, owing to the scarcity of vessels and the high rates demanded by the ship-owners.

The seed market has been active. Linseed has risen to some extent, owing to the threatened blockade of the Baltic and Black Sea ports, and there is every prospect of a further considerable rise in the quotations; hence we may assume that cakes will be much dearer, as the season progresses, than they are at present.

Both hay and straw have been in good request, and prices have ruled steady. The quality of both has turned out inferior. In the metropolitan markets, meadow hay has changed hands, at from £2 15s. to £5 5s.; clover do., £3 15s. to £6 6s.; and straw, £1 16s. to £2 5s. per load.

The tallow market has been in a very excited state, at a considerable improvement in prices. Rough fat has advanced to 3s. 7d. per 8lbs.

The lambing season, with some few exceptions, has passed off extremely well. The fall has been a full average one.

The cattle trade has continued in a most healthy state. Breeders have succeeded in obtaining very high rates for store animals—rates which will leave a very small margin of profit to the feeders; but the numerous fluctuations observed in the quotations in the leading stock markets have been productive of rather heavy losses to the jobbers.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although the total imports of foreign stock into England have exhibited a falling off compared with the same period in 1853, the various cattle markets have been seasonably well supplied. With the exception of the sheep having appeared somewhat out of condition—not being observed amongst even the best flocks—all English and Scotch breeds have appeared of rather heavy weights. Prices of both beasts and sheep have fluctuated; yet they may be considered remunerative. There is one feature in connection with the trade which we conceive to be important, and which is calculated to insure for us a better supply of food in future; viz, the increased age in which most of the sheep were shewn in Smithfield and elsewhere. We have all along condemned the system of disposing of young flocks; because we have felt convinced that the system must wear itself out, and prove less remunerative to the flockmasters. We need scarcely point out to the practical reader the advantages, in a general point of view, which have frequently resulted from having strong flocks on hand; but we may be permitted to observe that the wholesale slaughtering of two-year-old sheep must eventually

produce higher prices than the smaller graziers can afford to pay, and which must tend to check consumption. The stock has fared tolerably well; yet we learn that in most parts of England the supply of hay and turnips is nearly exhausted. The quality of the former is so inferior, that large portions of it can scarcely be considered fit for consumption.

The imports of foreign stock into London, during the month, have been as under:—

		Head.
Beasts		2,664
Sheep		4,904
Calves		834
Pigs		7
	Total	8,409
Corresponding month in 1853		10,384
—	1852	6,747
—	1851	8,381
—	1850	6,004
—	1849	8,034
—	1848	4,421

The following are the total supplies of stock exhibited in Smithfield:—

	Head.
Beasts	20,588
Cows	532
Sheep	93,060
Calves	1,091
Pigs	2,780

COMPARISON OF SUPPLIES.

	March, 1851.	March, 1852.	March, 1853.
Beasts ..	16,040	18,699	19,228
Cows ..	314	448	360
Sheep ..	85,920	100,465	85,680
Calves ..	1,236	1,280	1,614
Pigs	2,184	2,629	2,780

The bullock supplies from Norfolk, Suffolk, Essex, and Cambridgeshire have amounted to 10,300 Scots and shorthorns; from other parts of England, 3,000 of various breeds; and from Scotland, 1,340 horned and polled Scots.

The highest and lowest prices paid have been as under:—

		s. d.	s. d.
Beef	from 2 10	to 4 8	
Mutton	3 2	5 2	
Lamb	5 4	7 0	
Veal	4 4	5 8	
Pork	3 4	4 10	

COMPARISON OF PRICES.

	March, 1851.		March, 1852.		March, 1853.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef ..	2 4 to 3 10	2 4 to 3 8	2 8 to 3 4	2 8 to 3 4	2 8 to 3 4	2 8 to 3 4
Mutton ..	2 10 4 8	2 6 4 4	3 10 5 4	3 10 5 4	3 10 5 4	3 10 5 4
Lamb ..	5 0 6 0	4 8 5 0	5 4 6 6	5 4 6 6	5 4 6 6	5 4 6 6
Veal ..	3 0 4 0	3 4 4 6	3 4 4 8	3 4 4 8	3 4 4 8	3 4 4 8
Pork ..	3 0 4 0	2 6 3 10	2 10 4 0	2 10 4 0	2 10 4 0	2 10 4 0

Newgate and Leadenhall have been well supplied with country-killed meat; for which the inquiry has ruled steady, and prices have been well sup-

ported. Beef has changed hands at from 3s. to 4s. 4d.; mutton, 3s. 2d. to 4s. 6d.; lamb, 5s. 4d. to 6s. 6d.; veal, 4s. to 5s. 4d.; pork, 3s. 4d. to 4s. 8d. per 8lbs. by the carcase.

The demand for hides and skins, owing to the inactive state of the leather trade, has been rather heavy; yet, on the whole, the currencies have been tolerably firm.

REVIEW OF THE CORN TRADE DURING THE MONTH OF MARCH.

The dulness which prevailed in the wheat trade when we last addressed our readers—and which we were then disposed to think would prove but temporary—has continued, and a further considerable fall has occurred in the value of the article. The original cause of the decline was, in our opinion, the somewhat too great rise in January. Till the end of the year 1853 the advance was legitimate; but it was subsequently carried on by speculative purchases, principally at Liverpool, to a point which raised our quotations so much above those current in most of the neighbouring continental ports, that the current of supply was changed. Instead of France and Belgium purchasing in the British markets, as they had previously done, shipments of wheat and flour began to be made from those countries to English ports; and these have continued up to the present period. At the same time, large quantities of breadstuffs were poured in from America. The effect of this state of things was to deter those who had bought to hold over from entering into further operations; and it was not long before re-sales began to be made—at first sparingly; but afterwards sales were forced on a large scale, to provide for acceptances coming due, until, at length, something like a panic was created. The entire fall from the highest point in January may be fairly estimated at 10s. per qr. on wheat; and the decline in the value of American flour has been relatively greater. Though we were prepared to expect a reaction in prices about this period, and intimated as much on several occasions about the close of last year, we neither expected the fall to come quite so early nor to be so important.

The fact is, the very circumstance which of all others was deemed most likely to cause a high range of prices—viz., war with Russia—has, thus far, had the opposite effect. The imminence of the danger of hostilities being commenced on the Baltic with the opening of the navigation rendered merchants there exceedingly anxious to ship early, so as to get their corn despatched before the actual outbreak of war; we have, therefore, for the last two or three months been flooded with offers of wheat from the Baltic ports, at prices very materially below those current in our markets. When

Rostock wheat was selling at Mark-lane at 90s. per qr., there were offers to ship similar quality at first open water at a price, including freight here, but little exceeding 80s. per qr. The offers from Stettin were equally low, and it was therefore clear that if this continued our prices must come down to the same level; which has in fact been the case, so that at present there remains but little margin for profit on what has or what may yet come to hand from that quarter. If there had been no danger of war, and consequent prospect of an interference with the regular course of business, our continental neighbours would have acted with more circumspection, and, by spreading the supplies over a larger space of time, have prevented the pressure which has been occasioned by a larger quantity having been offered than could be immediately placed.

Thus far, therefore, the prospect of war has certainly tended to depress rather than raise prices here; and this has further been the case, inasmuch as it has abstracted a large amount of capital from the usual channels, to provide for the extraordinary demands for the equipment of the navy and army. It will thus be seen that the fall in the value of wheat has not been without reason; but it may well be questioned whether any of the causes which have produced this effect will be of long continuance, except that which relates to money pressure.

The reduction of 10s. per qr. which has taken place in the value of wheat has lessened the temptation to ship largely to the English markets; and we are strongly of opinion that, as far as France is concerned, we shall in a short period see a falling off, if not a cessation of supplies.

The early shipments from the Baltic have already partly arrived, and the remainder cannot be far off; after these shall have come to hand, we are likely to have a break in the supply. The same may be said in regard to America, the recent dull advices from hence having proved very discouraging to shippers on the other side of the Atlantic.

From the Black Sea no shipments were to be permitted after the 13th of March, and within the last week we have received the intelligence that Turkey had deemed it advisable to prohibit the export of corn,

We do not mean to assert that there is any prospect of an immediate scarcity of wheat being experienced, but we are certainly inclined to think that the worst point of depression has for the present been past; and unless the summer should prove unusually auspicious, so as to prevent anything like apprehension being felt at any period for the crop on the ground, the late decline might yet be very easily recovered.

The importance of Russia as an exporting country of corn is hardly as yet fully estimated. It is not alone Great Britain that has to look to the Black Sea and the Russian Baltic ports for supplies; but in a year like the present, following one of deficient harvests in England, France, and many of the Italian States, who habitually depend on Southern Russia for a large portion of the wheat they consume, the interruption to trade which must inevitably attend on war cannot but be seriously felt sooner or later; and we have no hesitation in saying that the plan which our merchants and millers are now adopting—some from choice, others from necessity—of reducing their stocks to the lowest possible ebb, may be attended with danger.

That the deficiency of the last harvest was not exaggerated we have daily proofs. The supplies from the farmers have not increased either with rising or falling markets. Stocks are everywhere disappearing; and, notwithstanding the enormous importations of breadstuffs which have taken place from abroad, the supplies of home-grown corn have been quickly absorbed.

The following statement of the quantities of wheat sold during the last four weeks, at the towns which return the averages for the kingdom, appears to us to afford reliable evidence of the smallness of the last crop as compared with that of 1853, and may be interesting to our readers—

	1854.	1853.
	Qrs.	Qrs.
Week ending Feb. 25. . . .	55,662	86,001
„ Mar. 4. . . .	61,890	84,548
„ 11. . . .	65,753	103,145
„ 18. . . .	53,244	90,268

The weather has throughout the month been highly auspicious for all kinds of out-door labour, and rarely has a more favourable season been experienced for the sowing of spring corn. There has been scarcely a day that field work could not be carried on with advantage, and rapid progress has consequently been made; indeed, it may be safely said that by the middle of March as much work had been completed as is generally the case at the end of that month. The extraordinary fineness of the season and the probability of remunerative prices have tempted many farmers to sow spring wheat where the land was suitable, and the

breadth altogether is perhaps greater than it has been for some years past. In regard to that sown in the autumn the reports are somewhat conflicting, but on the whole we have heard of no serious complaints; indeed, we do not in general attach much importance to what is said thus early as to the appearance of the plant; but in the course of another month or two the aspect of the fields will no doubt have great influence in determining the course of quotations. We will, however, leave this point entirely out of our calculation. We will take it for granted that a larger breadth of land is under wheat than usual, and that the winter has passed without doing any injury to the seed in the ground; nay, further—we will, for argument's sake, suppose that the seasons from this time up to harvest may be favourable, and the result of the next harvest all that could be desired. That such a combination of circumstances would influence the minds of sellers and buyers, there can be no doubt; but it would not give us an extra bushel of corn before September or October, and the question is, whether we shall have sufficient to reach the time at which the new crop may be expected to have become available, now that the shipment from Russia has wholly ceased. This will in our opinion be decided by the prices which may be current here. America, from whence we have already received a larger quantity of breadstuffs than usual, will not, we are led to believe, make further shipments of moment, unless the shippers can calculate on higher rates than are now obtainable in our markets; and with supplies from the Black Sea cut off, those of the Baltic interfered with, a material falling-off in the importations from America would very speedily change the aspect of affairs. We have all along said, and still say, that so long as Great Britain can afford to pay for what she requires, there is little fear of actual scarcity being experienced in this country; but we doubt whether present rates are high enough to insure a continuance of imports on a scale commensurate with our wants. The French government appears to have taken the alarm at the large re-shipments which have been made from thence to England. These shipments have for the most part been caused by pressure for money, and the government has therefore determined to afford the merchants such aid as to relieve them from the necessity of sending away that which they may afterwards have to buy back at higher prices. With this view it has been proposed to advance by way of loan on goods from 40 to 60 per cent. of their value, to the extent of ten millions of francs. Should this scheme have the effect of checking supplies from France, it would have an immediate influence here, as the consignments from Havre, &c., having for the most

part been made for the express purpose of raising money, they have, in nine cases out of ten, been sold on arrival without reserve, at the best price obtainable, and have consequently been one of the principal causes of the depression.

We shall now proceed to give our usual retrospect of what has taken place at Mark Lane during the month about to draw to a close.

The perfect insignificance of the arrivals of home-grown corn, as compared with the supplies from abroad, shows how dependent we have become on foreign countries. This matter is, in the present position of affairs, deserving of notice, as affording a tolerably good proof that any falling-off in the latter would very speedily tell on the trade.

The arrivals coastwise into the port of London have scarcely averaged 2,000 qrs. per week, certainly not *one-tenth* of the quantity required for the consumption of the metropolis alone. Our millers having, however, had a plentiful choice of foreign wheat, both old and new, have not been inconvenienced by the trifling nature of the supply of English; indeed, they have shown the utmost indifference about buying, and it has been necessary to give way in prices from week to week, in order to place the comparatively trilling lots which have come to hand from Essex, Kent, and Suffolk. From more distant counties scarcely anything has been offered.

At the close of February there was some appearance of firmness, but on the 6th inst. (the first Monday in March) the anxiety to sell was greater than the inclination to buy, and prices were decidedly in favour of the purchaser. On that day se'nnight the fall amounted to 2s., and in some cases 3s. per qr. The week following, the depression increased, and on the 20th a further decline of 2s. to 3s. per qr. took place, without enabling factors to clear the stands; which has, however, since been effected; and within the last few days 2s. to 3s. per qr. of the decline has been recovered.

The total supply from abroad, as far as the quantity has yet been made up, amounts to 174,200 qrs., mostly from northern and north-eastern ports. By far the greater portion of this enormous supply came to hand in eight or ten days, say between the 15th and 25th inst. Prices were tolerably well supported up to the 13th March; on that occasion, however, there was a giving way of at least 2s. per qr. on the best qualities, and on some sorts the reduction was perhaps double that. This concession failed to impart more activity to business, it having by that time become pretty well known that large supplies were close at hand, which induced buyers to confine their operations to what they required for immediate use. With a great accession of supply, there was no improvement in the demand the

following week, and those who calculated on a further fall were not disappointed, the decline from the 13th to the 20th having amounted to fully 3s. per qr. Even then, however, millers showed no inclination to increase their stocks; and though visited by buyers from various parts of the kingdom, they, too, deemed it advisable to hold off. The same tactics have since been pursued, and there appears a strong probability that importers will have to land the major part of the supply. Many of the leading town millers bought freely, through the London agents, for firms in the Baltic some time ago, and what they then purchased has now arrived. Their wheat will probably stand them in somewhat dearer than it would have done if they had bought on the spot; but for the present their wants are provided for, and we must look for an increased country demand to check the downward movement. The finer kinds of Lower Baltic wheat may now be had at from 70s. up to 80s., and St. Petersburg and similar sorts may be quoted from 68s. up to 73s. per qr. Southern kinds have suffered a similar or even greater depression, if we except Marianople, which, being much liked by our millers, has found takers at a decline of 5s. to 6s. per qr. from the rates current at the close of last month.

The first effect of the news stating that the exportation of grain from the Black Sea had been prohibited, and that no ships would be allowed to sail with corn cargoes either from the Black Sea or the Azoff, was to give confidence to those who had floating cargoes on passage, and more money was asked. Subsequently, however, it was discovered that buyers did not come forward; and there was, consequently, been a gradual giving way in quotations, to the extent of at least 5s. per qr. The last week, a cargo of inferior Polish Odessa wheat was sold at 58s. per qr., cost, freight, and insurance; and for Marianopoli, 73s. has, we believe, been accepted; a rally of 3s. to 4s. per qr. has since taken place in prices.

Since the arrival of so large a fleet of vessels from the Baltic, it has been quite impossible to sell free on board on the other side; and scarcely a transaction has during the last fortnight been closed in that branch of the trade.

The town millers did not alter the nominal top price of flour until the 13th, and then only to the extent of 2s. per sack. The sale for the article has throughout the month been languid in the extreme, the bakers having apparently determined to work out of stock before making further purchases. This plan is pretty generally adopted in the spring of the year, as, with the setting-in of warm weather, flour is always liable to go out of condition; but, independent of this cause, there

exists at present a strong opinion that prices of the article will be lower before they rally.

The arrivals of American flour were large in the early part of the month, more especially at Liverpool; but during the last fortnight, the supplies have been on a more moderate scale. This article has been very pressingly offered, and has been sold at Liverpool, as well as in our market, relatively cheaper than wheat. The entire fall from the highest point in January is not less than 8s. per brl., half of which took place in February, and half since. 41s. is now an extreme price for choice qualities, and very excellent parcels may be bought at Mark Lane at 39s., and at Liverpool still cheaper. The stock is rather heavy; but should imports be checked, as we believe they will, by the decline, the quantity on hand would soon be diminished.

The arrivals of barley of home growth have been moderate, and the supplies of this grain from abroad have not been large; but there has been a decided want of activity in the demand, and a gradual giving way in prices. In the early part of the month, we had a week or two of warm weather, which caused many of the maltsters to leave off work; and the demand has not since revived. The fall since the end of February has been from 2s. to 3s. per qr. on malting and distilling, and 1s. to 2s. per qr. on grinding qualities, with but a limited sale for each kind, at the reduction.

Prices of malt have been more or less influenced by the state of the barley trade; and though no actual decline has been quoted, the turn has been decidedly in favour of the buyer. The export demand for this article has fallen off, which, with some decrease in the consumption of beer, owing to the high prices of food which have prevailed during the winter, may partly account for the inactivity and downward tendency of prices.

The receipts of oats coastwise and from Ireland show little or no increase, when compared with the arrivals of previous months; and there can be no doubt that the stocks of this grain are reduced into a narrow compass in all parts of the United Kingdom. The high value which oats have borne for some months past has, however, proved a strong inducement to foreign shippers to collect all they could together, ready to be despatched to this country on the first breaking up of the ice. We have, consequently, within the last week or two, received a great number of small cargoes from the near continental ports, together with a fair quantity from Sweden and from the Danish islands, making altogether a very large supply. Previous to this, prices remained stationary, the dealers holding off, and consumers refusing to purchase beyond what they required for immediate use. Matters remained in this position up to the 20th

inst., when increased arrivals obliged importers to give way 1s. per qr., and a further decline to the same extent has since been submitted to. So soon as this concession had been obtained, the large dealers began to replenish their almost exhausted stocks; and unless the supply should be followed by another large arrival, the reduction in prices will, in all probability, be soon recovered. How we are to manage later in the year, without the usual assistance from Russia, remains to be seen; but we should certainly not be surprised to witness very high rates for oats in the autumn.

Beans have met with very little attention: the supply has been quite equal to satisfy the consumptive demand, and there has been no inclination to buy to hold over. This article has participated in the general depression, and is at present at least 2s. per qr. cheaper than it was at the close of February.

Peas have also been neglected; and though but few have appeared at market, the tendency of prices has been decidedly downwards.

We had moderately good arrivals of Indian corn off the coast in the early part of the month, mostly from ports east of Gibraltar. The greater part of the supply had been sold previous to coming to hand; and, there has, consequently, been no pressure. The consumption of this article in Ireland has certainly been much less this season than usual, which tends to strengthen the belief expressed on previous occasions—viz., that the potato crop in Ireland was much less affected by disease than was at one period supposed.

Having already alluded incidentally, in the foregoing part of this article, to the state of affairs in some of the foreign markets, we may dismiss this portion of our subject with less lengthened remarks than usual.

At the principal Baltic ports the business has been principally confined to fulfilling the contracts entered into during the winter; this has, however, been sufficient to impart some activity to the trade, and the supplies brought forward from the interior at the ports on the seaboard have found ready takers at prices not so much lower as might have been expected, considering the great fall here.

Danzig letters state that stocks in warehouse had been reduced into a very narrow compass, nearly all having been taken to load the vessels chartered for England. The farmers in that neighbourhood continued to speak very badly of the last crop, and stated that they would have little more to bring to market.

From Upper Poland no supplies had, up to that time, come forward.

Stettin advices, of the 21st inst., inform us that after a temporary depression the demand for wheat

had again revived; and though prices were not so high as they had previously been, the reduction submitted to had hardly corresponded to the known decline in the British markets. A large number of vessels, wheat-laden, had been despatched from thence, on the opening of the navigation, and a good many more were still loading; it was, however, calculated that the total shipments from thence would not much exceed half of what was exported from thence last season. The quality of the wheat grown in the neighbourhood of Stettin is described as very inferior; but from the Uckermark, and from Silesia, some good parcels had been received: quotations were then for 60lb. red Stettin 62s., and for Uckermark, of 60lbs. weight, 63s. to 64s. per qr. free on board. The weather had been and was then cold, and vegetation generally backward.

At Rostock stocks have also been reduced very low; as, besides what has been taken for shipment to England direct, considerable quantities have been drawn from thence, per railway, to Hamburg, at which latter place speculation, on a somewhat extensive scale, has taken place during the winter months. Fine 62½lb. quality could not be bought at the date of our last advices below 69s. per qr. free on board; and it would be impossible to secure any important quantity at that price, as the entire stock was computed to consist of only 50,000 to 60,000 qrs.

At the near ports, quotations have given way to nearly the same extent as in the English markets; but at the moment there is no margin for profit on consignments from the continent.

From France we learn that the downward movement in prices had continued; and though the Government had come forward to assist merchants with loans, on the security of their property, the extreme scarcity of money had been severely felt, and had, to a great extent, been the cause of the large re-shipments which had been made to England.

From the Mediterranean ports the advices are rather conflicting: at some, prices appear to have given way, and at others to have advanced. This may be accounted for by an unequal division of the supplies from the Black Sea; some ports having been plentifully supplied, and others left comparatively bare.

From Odessa and Galatz we learn that business had been brought to a complete stand by the political position of affairs: and, after the prohibition of exports, prices had fallen materially in all the Russian markets.

The advices from America are of a much more subdued tone than they were when we last addressed our readers; still, quotations are relatively high there, as compared with present prices here.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter	
WHEAT, Essex and Kent, white.	70 to 72	fine 74 80
Ditto ditto new	68	73 fine 75 82
Ditto ditto red	68	73 " 76
Ditto ditto new	65	74 " 76
Norfolk, Lincoln, & Yorksh, red.	64	70 " 74
BARLEY, malting, new.	40 42	Chevalier. 43 44
Distilling.	38 40	Grinding. 35 38
MALT, Essex, Norfolk, and Suffolk, new	66	67 extra 69
Ditto ditto old	64	65 " 68
Kingston, Ware, and town made, new	70	71 " 72
Ditto ditto old	68	70 " 71
OATS, English feed.	25 28	Potato. 29 31
Scotch feed, new 30 31, old 32 33		Potato 33 35
Irish feed, white	28	29 fine 30
Ditto, black	24	26 fine 28
RYE	none	— " —
BEANS, Mazagan.	42 44	" 47 50
Ticks.	44 46	" 48 52
Harrow.	46 48	" 50 54
Pigeon	46 52	" 54 62
PEAS, white boilers 57 58. Maple 47 49		Grey 44 46
FLOUR, town made, per sack of 280 lbs. —		" 66 70
Household, Town 63s. 64s. Country		" 58 62
Norfolk and Suffolk, ex-ship		" 53 55

FOREIGN GRAIN.

	Shillings per Quarter	
WHEAT, Danzig, mixed.	71 to 75	high mixed 78 80 extra 83
Konigsberg	72 74	" 75 " 78
Rostock, new	71 75	fine 76 " 77
American, white.	75 80	red 72 75
Ponera, Meckbg., and Uckermark, red	70	73 extra 75
Silesian.		70 73 white 74 76
Danish and Holstein	" 70 75	" none
Rhine and Belgium	" —	— old —
Odessa, St. Petersburg and Riga.	63 66	fine 66 69
BARLEY, grinding 33 37		Distilling. 39 40
Malting.		none — —
OATS, Dutch, brew, and Polands 27s., 29s.		Feed 25 27
Danish & Swedish feed 27s. to 29s.		Stralsund 28 30
Russian.	29 30	French. none
BEANS, Friesland and Holstein . . . . .		.. 42 48
Konigsberg.	47 50	.. Egyptian .. 45 47
PEAS, feeding	50	54 fine boilers 55 58
INDIAN CORN, white.	45 48	yellow 45 48
FLOUR, French, per sack (none) —		nonc — —
American, sour per barrel 34 38		sweet 38 40

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.

WEEK ENDING:	Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Feb. 11, 1854.	82	4	41	3	27	4	43	2	47	10	50	3
Feb. 18, 1854.	80	1	39	11	27	5	49	5	46	10	51	7
Feb. 25, 1854.	78	5	38	4	27	1	49	10	45	11	48	7
March 4, 1854.	78	3	37	10	27	0	47	2	45	10	48	5
March 11, 1854.	79	6	38	7	27	2	49	5	45	2	48	2
March 18, 1854.	79	2	38	9	27	7	50	2	45	11	47	5
Aggregate average of last six weeks	79	3	39	1	27	3	49	1	46	3	49	1
Comparative ave. same time last year	45	3	31	5	18	4	30	6	34	6	32	1
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.				Averages from the correspond ing Gazette in 1853.			
Qrs.		s. d.		Qrs.		s. d.	
Wheat.	53,244	79	2	Wheat.	90,268	45	5
Barley.	55,632	38	9	Barley.	63,037	31	9
Oats	16,955	27	7	Oats	21,449	18	10
Rye.	134	50	2	Rye.	127	30	10
Beans.	4,912	45	11	Beans.	6,765	34	2
Peas	1,123	47	5	Peas	2,244	32	11

PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.).. sowing 62s. to 60s.; crushing 50s. to 56s.	
Linseed Cakes (per ton).....	£10 0s. to £10 10s.
Rapeseed (per last).....	£30 to £35
Ditto Cake (per ton).....	£6 15s. to £7 5s.
Cloverseed (per cwt.)..... (nominal)	00s. to 00s.
Mustard (per bush.) white new 10s. to 14s., brown old 10s. to 13s.	
Coriander (per cwt.)..... new 10s. to 15s., old 10s. to 15s.	
Canary (per qr.)	48s. to 5 s.
Caraway (per cwt.)..... new 42s. to 44s., old 44s. to 48s.	
Turnip, white (per bush.) 14s. to 20s. Swede 24s. to 38s.	
Trefoil (per cwt.).....	22s. to 28s.
Cow Grass (per cwt.).....	65s. to 76s.

FOREIGN SEEDS, &c.

Linseed (per qr.)... Baltic, 50s. to 55s.; Odessa, 55s. to 58s.	
Linseed Cake (per ton).....	£9 10s. to £10 10s.
Rape Cake (per ton).....	£6 15s. to £7 5s.
Hempseed, small, (per qr.)... 00s.,	Ditto Dutch, 42s.
Tares (per qr.)	new, small 64s., large 68s.
Rye Grass (per qr.)	28s. to 35s.
Coriander (per cwt.).....	10s. to 13s.
Clover, red,	46s., 50s., 54s. to 58s.
Ditto, white	68s. to 84s.

HOP MARKET.

BOROUGH, MONDAY, March 27.

The demand for all fine Hops has continued moderate during the past week, and fully as much money for such descriptions has been obtained. In inferior qualities scarcely anything is doing. HART & WILSON.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

MONDAY, MARCH 27.

During the past week there have been very large arrivals coastwise, and a further decline in prices has been the consequence.

The following are this day's quotations—

	s.	d.	s.	d.
York Regents	120	0	140	0
Forfarshire Regents	110	0	125	0
Pewshshire ditto	110	0	120	0
Fifeshire ditto.....	110	0	120	0
Reds and Cups	100	0	110	0
Irish Whites.....	100	0	110	0
Rhenish ditto	95	0	100	0

BOROUGH AND SPITALFIELDS.

MONDAY, March 27.

These markets continue to be fairly supplied with most kinds of potatoes. The demand is by no means active. In prices no material change has taken place. York Regents, 120s. to 165s.; Kent and E-sex ditto, 120s. to 150s.; Scotch ditto, 115s. to 125s.; ditto Cups, 110s. to 120s.; Irish, 100s. to 115s.; foreign, 100s. to 115s. per ton. Last week's imports were 20 tons from Hambro', 160 ditto from Rotterdam, 1 from Dublin, 90 from Belfast, and 1 from Limerick.

ENGLISH BUTTER MARKET.

March 27.

We note a good fair trade in Butter at steady prices. The supply to our market of both English and Foreign is seasonably good.

Dorset, fine weekly	112s. to 116s. per cwt.
Do., middling	96s. to 98s. "
Fresh, per dozen lbs.....	12s. to 15s.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	s.	s.	Cheese, per cwt.	s.	s.
Friesland	105	10	Cheshire, new.....	67	80
Kiel.....	106	112	Cheddar	68	80
Dorset	104	116	Double Gloucester	64	72
Carlton	98	102	Single do.	60	70
Waterford	94	100	Hams, York, new.....	76	86
Cork	98	104	Westmoreland.....	72	82
Limerick	86	96	Irish	70	78
Sligo	96	104	Bacon, Wiltshire, green	62	64
Fresh, per doz. 13s. 0d. 16s. 0d.			Waterford	69	61

HIDE AND SKIN MARKETS.

SATURDAY, MARCH 25.

	s.	d.	s.	d.
Market Hides, 56 to 64 lbs.....	0	2 3/4	0	0
Do. 64 72 lbs.....	0	2 1/2	0	3
Do. 72 80 lbs.....	0	3	0	3 1/2
Do. 80 88 lbs.....	0	3	0	3 1/2
Do. 88 96 lbs.....	0	3 1/2	0	3 3/4
Do. 96 104 lbs.....	0	3 1/2	0	4
Horse Hides.....	6	6	0	0
Calf Skins, light	2	0	3	0
Do. full	5	6	0	0
Polled Sheep	7	6	9	0
Kents	7	0	8	0
Half-breeds	6	6	7	6
Downs	5	0	6	3
Shearings	1	6	1	7

WOOL MARKETS.

BRITISH WOOL TRADE.

MONDAY, March 27.

Since this day se'nnight there has been much disinclination shown to invest in any kind of wool. The only quality in moderate request is fine Down, which is certainly quite as dear as previously advised. We have no actual change to report in the quotations of longwools; but, to effect large sales, lower rates must be submitted to.

	s.	d.	s.	d.
Southdown Hoggels	1	4	—	1
Half-bred Hoggels	1	3 1/2	—	1
Ewes, clothing	1	2	—	1
Kent Fleeces	1	2 1/2	—	1
Combing Skins	0	11	—	1
Flannel Wool	0	11 1/2	—	1
Blanket Wool	0	8	—	1
Leicester Fleeces	1	1 1/2	—	1

LEEDS ENGLISH WOOL MARKET, March 24.—Sales of combing and clothing wools have been flat this week, and prices in favour of the buyer.

YORK WOOL MARKET, Thursday.—We had only a small show of wool, from sixty to seventy sheets, and a decline in prices took place from those of the last market, to the extent of from 6d. to 9d. per stone of 16lbs. Fully one-half of the wool was left unsold.

LIVERPOOL WOOL MARKET, MARCH 25.

SCOTCH.—There is very little doing in any class of Scotch wool, except for the immediate wants of the trade, and, as they are generally lightly stocked, they keep taking a little at about old rates; if any change, it is in favour of the buyer.

	s.	d.	s.	d.
Laid Highland Wool, per 24lbs.....	13	0	14	0
White Highland do.....	16	6	18	0
Laid Crossed do, unwashed	16	0	18	0
Do. do, washed	18	0	20	0
Laid Cheviot do, unwashed	19	6	21	0
Do. do, washed	22	0	24	0
White Cheviot do .. do	26	0	32	0

LEEDS FOREIGN WOOL MARKET, March 24.—

There has been great slackness in all branches of the foreign and colonial wool trade during the past week. Prices remain unchanged since the close of last sales.

MANURES.

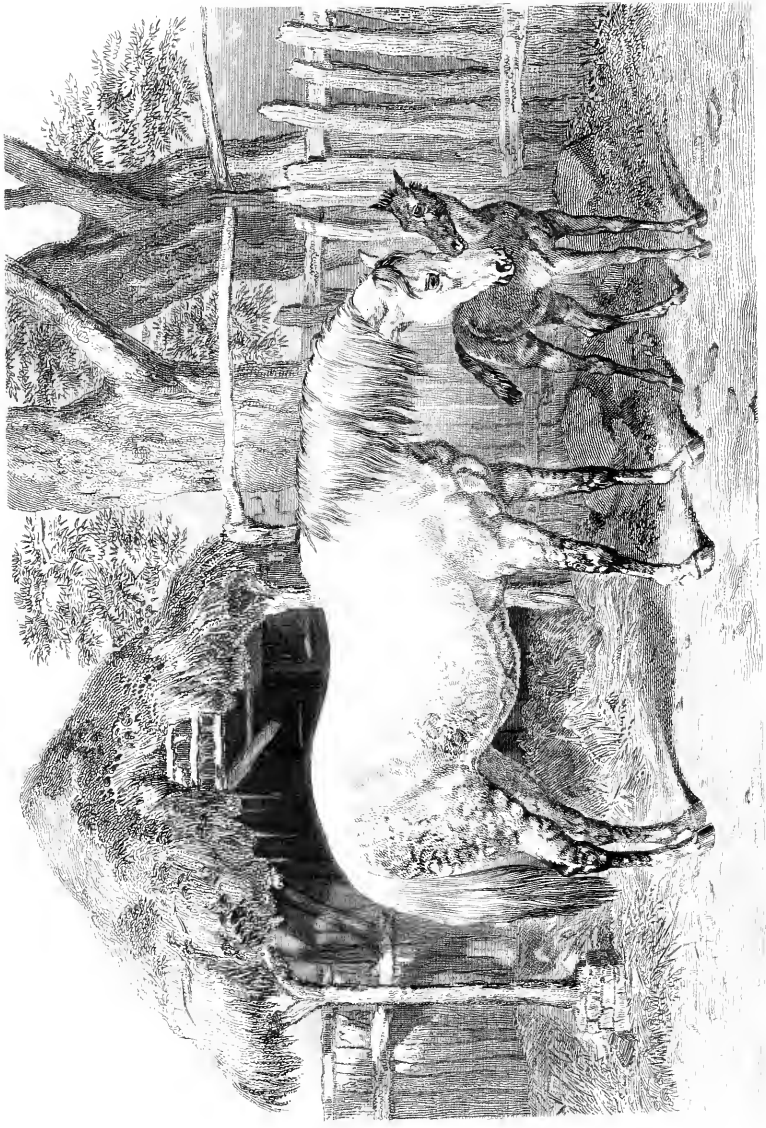
PRICES CURRENT OF GUANO.

Peruvian Guano	per ton	£11	0	0	to	£11	10	0
Do, first class (damaged).....		10	0	0		10	10	0
Bolivian Guano		9	0	0		9	5	0

ARTIFICIAL MANURES, OIL CAKES, &c.

Peat Charcoal		3	0	0	0	0	0	0
Nitrate Soda		19	0	0		19	10	0
Nitrate Potash or Saltpetre		33	0	0		40	0	0
Sulphate Ammonia		18	0	0		19	0	0
Muriate ditto		22	0	0		23	0	0
Superphosphate of Lime		6	0	0		6	0	0
Soda Ash or Alkali		0	0	0		8	0	0
Gypsum		2	0	0		2	10	0
Coprolite		5	0	0		0	0	0
Sulphate of Copper, or Roman Vitriol for Wheat steeping.....		44	0	0		0	0	0
Salt		1	1	0		1	5	0
Bones 1/2 inch	per qr.	0	18	0		0	19	0
Do, Dust		0	18	6		0	19	0





THE FARMER'S MAGAZINE.

MAY, 1854.

PLATE I. HEREFORD BULL.

The subject of our first plate, is the property of Lord Berwick, of Cronkhill, near Shrewsbury, and was bred by his lordship. This bull, Albert Edward (859), W. F., by Wonder (420), was calved Jan. 12, 1850. Dam Victoria, by Hope (439). Grandam Countess, by Young Chance (449). Victoria obtained prizes as the best in-calf heifer at the meeting of the Royal Agricultural Society of England, at Southampton, in 1844; as the best cow in-milk at the Shrewsbury meeting in 1845, &c., &c.

Albert Edward obtained the second prize in the young class for bulls at the meeting of the Royal Agricultural Society of England, at Lewes, in July, 1852; the first prize for bulls of any age above two years, at the Midland Counties Meeting held at Wolverhampton, September, 1852; and first prize for aged bulls, at the meeting of the Royal Agricultural Society of England, at Gloucester, 1853, and has not been exhibited elsewhere.

PLATE II. A WELL-BRED MARE, AND FOAL AT FOOT.

The calm pleasures of domestic life afford perhaps but limited scope for either pen or pencil. In selecting the mare with her foal, however, as his embodiment of the horse's "affection," Mr. Herring has once more evinced his intimate knowledge of the animal. The horse likes company—the one that stands in the stall beside him—the groom that tends him—the master who uses him—down even to the cat that dozes on his back. But in no case is the power of affection so strongly developed as with a mare and a foal. It is indeed a mother's love. Only mark the anxiety of her which misses the young one from her side—her utter disquietude, and the eagerness with which she seeks for him. And, then, when the wayward one chooses to return, see how soon she is comforted—how she fondles over him—and shows in every look and movement generous AFFECTION.

AGRICULTURAL STATISTICS.

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

That the English farmer should view the question of agricultural statistics with feelings of doubt, need hardly excite any surprise. His experience of recent laws, involving the interests of agriculture, can hardly inspire him with confidence. It is true that in time he is in general able to adjust his farming to the altered circumstances in which he may be placed by new laws; but the transition from one state of affairs to another has unfortunately almost always been made at his expense. He can regulate, after a while, his operations, according to the laws and the times he has

to encounter; but all material legislative enactments which relate to agriculture are almost always, at *first*, at the expense of the occupier. These reflections naturally lead the tenant-farmer to be, perhaps, rather too suspicious of the objects and results likely to be accomplished by Acts of Parliament. We have a notable instance of this in the way in which the recent proposition to establish a general enumeration of the live stock and the agricultural crops of England has been received. Thus it has been supposed, that in this scheme is included some deep-laid plot to obtain information

injurious to the tenant-farmer; that, by the knowledge thus acquired, the merchant and the consumers' interests will be more served than those of the producer; and that from such returns corn-factors will gain the materials for unfair bargains, and landlords find evidence of broken covenants and injurious farming.

It appears to me, however, that these, in some degree, natural suppositions, are unfounded; and as I am led to the conclusion (amongst other material facts) by examining into the effect already produced upon the farmers' interests by the valuable official enquiries now carried on for many years by the Legislature, it may be useful if I give some of these returns, to which I have recently had occasion to refer; at any rate, they will be interesting and instructive to many of my readers, who, I venture to conclude, have not had an opportunity of consulting the Parliamentary returns to which I have alluded.

First, then, I find many very accurate Parliamentary returns, closely affecting the barley-growers, especially the producer of malting barley: for instance, from one of these of the last session (No. 102), I learn that in the three last years ending January 5) there were manufactured the following number of bushels of malt:—

1851	40,774,750
1852	40,337,412
1853	41,071,676

Of this quantity of malt, we find from another return (No. 222, Session 1853), that in the year ending Oct. 10, 1852, out of 4,404,067 qrs. of malt charged with duty, 3,358,327 qrs. were used by brewers and victuallers, and 471,203 qrs. by retail brewers.

From a similar return (No. 102, Session 1853) we ascertain that in the three last years, ending Jan. 5, there were exported from this country:—

1851	10,683 bushels.
1852	20,690 „
1853	51,160 „

That during this period there were exported the following large amount of beer, viz., in:—

1851	177,992 barrels.
1852	182,328 „
1853	232,365 „

Of this and other published information, with regard to malt, the occupiers of the barley lands have made no complaints. If, however, the barley growers had any cause to complain of the searching Parliamentary enquiries to which they have been subjected, still more ought we to reasonably anticipate the louder complaints of the hop-growers; for they have been long subjected to the most careful and accurate statistical enquiries. For from the Parliamentary returns to which I have just referred, I learn that the weight of hops

charged with duty, in the three last years, was as follows:—

1851	48,537,669 lbs.
1852	27,042,996 „
1853	51,102,494 „

But these hop returns do not stop here. In another Parliamentary paper (No. 177, Session 1853) I find the following statement of the number of acres of hops grown in each excise collection in the year 1852:—

Collection.	Acres.	Collection.	Acres.
Barnstaple ..	4 $\frac{3}{4}$	Reading.. ..	6
Canterbury ..	9,493 $\frac{3}{4}$	Rochester ..	16,360 $\frac{1}{2}$
Cornwall ..	1	Shrewsbury ..	3
Coventry ..	0 $\frac{5}{8}$	Sheffield ..	174 $\frac{1}{2}$
Derby	21 $\frac{1}{2}$	Stourbridge ..	464 $\frac{1}{2}$
Dorset	4	Suffolk	135 $\frac{3}{4}$
Essex	147 $\frac{3}{4}$	Surrey	104 $\frac{1}{4}$
Gloucester ..	15 $\frac{1}{2}$	Sussex	10,109 $\frac{3}{4}$
Hants	1,730 $\frac{3}{4}$	Taunton	9
Hereford ..	5,022 $\frac{1}{2}$	Wales, Middle	16
Isle of Wight	1,169 $\frac{3}{4}$	Ware	6
Leicester ..	1 $\frac{1}{2}$	Worcester ..	1,107 $\frac{1}{2}$
Lincoln	27		
Middlesex ..	9	Total	46,157 $\frac{5}{8}$
Northampton	2 $\frac{1}{4}$		

But this annual hop return has long gone still more closely into particulars; it gives in other columns the hop acreage of every parish—for instance, it gives the last-named (or Worcester collections) acreage as follows:—

Parishes.	Acres.	Parishes.	Acres.
Ashchurch ..	16	Malvern, Great	56 $\frac{1}{2}$
Bredon	27	Martley	74
Broadwas ..	20	Newland	18
Clifton	75	Powick	67
Cotheridge..	70	Shelsley, Little	3
Cradley	6	Shelsley Walsh	27
Doddenham ..	11	Stanford	2
Grimley	23	Suckley	167
Hallow	22	Churchill	5 $\frac{1}{2}$
Hanley Castle	6	Sapey, Lower ..	8
Hembleton ..	5	Tedstone Delamere	19
Holt	16	Welland	4
St. John	68	Wichenford ..	65 $\frac{1}{2}$
Kenswick ..	3	Whitbourne ..	84
Knightwick ..	24		
Leigh	115	Total	1,107 $\frac{1}{2}$

Now it is hardly necessary to give, in any statistical return relating to agriculture, any more particular results than these; and yet we have had no complaints from the great and intelligent hop-growers of England, of the ill-effects of such public enquiries. The return gives even the average produce of hops per acre in each collection, and in England—for instance, in this kingdom, in 1850, the average duty charged per acre was £9 17s.; 1851, it was £5 9s. 5d.; 1852, £6 7s. 10d.

These official enquiries have now long been made, without complaint from the growers, throughout the hop districts of England, and on the 20th of May, 1853, a similar enquiry was made with

regard to all farm crops, (a return collected chiefly through the aid of the Highland Society of Scotland,) in the counties of Roxburgh and Haddington, and of 2,680 crofts of the county of Sutherland. The information upon which these returns were made, according to the accompanying statement of Mr. J. H. Maxwell, the secretary of that excellent society, was all given voluntarily, except in three instances, where the schedules were filled by the enumerator:—

“If necessary,” adds Mr. Maxwell, “I can furnish an abstract of the returns of each parish, *but not for publication*, as I have passed my word that the gross returns of counties and districts only would appear. Without such an assurance, it would frequently have been more difficult to obtain returns.” In the record, it seems, which Mr. Maxwell possesses, is found every individual return. In this record, however, parties are not named; but are distinguished by numerals, having reference to their schedules.

The result of these valuable enquiries will be found in the following digest, which contains the agricultural statistics of the counties of—I., Roxburgh; II., Haddington; III., Sutherland, taken on May 20, 1853 (*Parl. paper*, 1853, No. 917)—

IMPERIAL ACRES.	I.	II.	III.
Total	358,943	149,173	810,913
Arable	146,818	107,269	22,022
Wheat	5,181	15,339	627
Barley	14,615	12,809	3,682
Oats	28,862	16,802	6,121
Rye	14	46	8
Beans and peas	1,642	4,809	89
Vetches	350	1,011	139
Turnips	23,809	16,260	2,212
Potatoes	1,454	4,246	2,279
Mangold wurzel	16	48	—
Carrots	6	107	114
Cabbage	10	15	28
Flax	2	—	2
Turnip seed	43	157	1
Alternate grasses	44,558	26,885	4,977
Improved permanent grass enclosures ..	23,658	6,228	1,779
Irrigated meadows ..	925	87	38
NOT IN CROP.			
Bare fallow	966	2,127	23
Sheep walks	186,895	28,630	599,710
Houses, gardens, roads, fences	4,900	2,586	2,290
Woods	17,679	9,313	10,812
Waste	3,320	1,660	176,294
NO. OF STOCK.			
Horses	4,975	4,450	2,794
Milk cows	4,762	2,377	6,547
Other cattle	12,058	7,576	6,045
Ewes	226,894	36,979	97,666
Tups and wethers ..	51,869	29,597	70,504
Swine	4,607	5,580	1,310
Agricultural steam, water, and horse machines	—	373	—

Such a return need hardly be more particular; the estimated or ascertained produce of the district might advantageously be added; but then of course the name of each occupier, and of every farm, may be usefully withheld, and with these precautions—whilst no person's affairs were exposed—a great mass of valuable information would be collected, and rendered available.

If we deviate for a time from our agricultural paths, and for the sake of comparison enquire as to the course pursued with regard to other branches of trade and industry, we find that no complaint is ever made of the effects of such Parliamentary returns. During each session of Parliament certain monthly accounts, relating to trade and navigation, are ordered to be printed, and every thing relating to agriculture is from these annually extracted, and inserted at page 62 of the *Farmers' Almanac*. Of any ill-effect from these returns, so eagerly consulted by the merchant and the manufacturer, we do not hear of any complaints. Members of Parliament, indeed, who may be said to represent particular interests, are generally foremost in moving for special returns. I have a pile of these printed accounts now before me. In one I find recorded the imports and exports of sugar, in each year, for a lengthened period: in these I notice the large and steady increase of foreign sugar retained for home consumption. This amounted, in 1849, to 25,250 cwts.; 1850, 101,277 cwts.; 1851, 302,132 cwts.; 1852, 268,913 cwts.

The same remark is applicable to the imports of palm oil, an article not merely interesting to the farmer from its use as a substitute for tallow in soap-making, since we may regard it as leading to still higher results, this being an article of commerce whose extended and profitable cultivation is one chief inducement for the African Princes to abandon the slave trade. The imports of palm oil were, in the year 1792, only 4,609 cwts.; in 1802 these had increased to 7,718 cwts.; 1812 to 11,637; 1822, 63,754; 1832, 217,804; 1842, 420,171; 1852, 608,550 cwts.

Judging, then, of the results of statistical inquiries already instituted and published, with regard to trade and manufactures on the one hand, and still more closely relating to the cultivation of more than one great branch of the agriculturists labours—judging, I say, by the results of such practical experience, we may safely conclude that a fairly-conducted statistical enquiry, as to the agriculture of England, will not only result in the avoidance of all individual injury or discomfort; but add materially to the solid information of the occupiers of the soil, enabling them to calculate on safer

data than those upon which they have hitherto, in spite of all their efforts to obtain solid information, been compelled rely, and placing them, as regards correct official returns, in the same position as other intelligent and enterprising branches of the community.

TOWN SEWERAGE—HOW AVAILABLE.

BY J. TOWERS, M.R.A.S., H.S., ETC.

Vain and useless repetitions I disclaim; but there are subjects of great (yet, according to some persons, of doubtful) import. It is thus with the case of *liquid* versus *solid* manure, in reference to the *sewerage of towns*. The *manure of the farm and fold*, there produced, is inevitably out of the question; for that invaluable fertilizer *must* be used upon the farm, or sold to the gardeners or other persons whom experience has instructed to regard it as the most comprehensive material that can be incorporated with the land.

Residing at Croydon, and having taken a lively interest in the operations of its Local Board of Health, I have felt it a duty to enter into some researches on the subject, and from time to time state their results. Thus, I was enabled to confirm the facts so clearly detailed by Dr. Anderson, Chemist to the Highland Society, and then to exhibit to our Board a sample of a fluid pellucid as that of the purest spring-water, obtained from a fetid mixture of stale urine and horse-droppings, passed through the carbonized peat obtained at our filtering establishment. Dr. Anderson had gone through a course of analyses, which perfectly justified his conclusion that peat, however it might *deodorize*, would fail to arrest either ammonia or its salts; and my repeated operations proved, beyond question, that, however *pure* as to foul odour or colour the filtrated product of sewage might appear to be, in point of fact it would remain strongly tainted with salts of lime, potassa, ammonia, and perhaps of soda, and utterly unfit to drink, or to be passed into any small rill or stream.

Occasion will occur of appealing to the authority of Dr. Anderson; but now I refer the readers of the *Mark Lane Express* to that of April 10th inst., pp. 10 and 11, and particularly to the speeches of Mr. Cutlibert Johnson and Mr. Meehi, in reference to the efficacy and expense of supplying land with the *entire* fluid sewage of a locality direct as it flows from the drains or sewers, &c., without any attempt to decompose it, or to throw down the small bulk of the *solid* contained in an immense volume of *fluid* matter, by a process which must inevitably occasion heavy outlay, and much grievous local *offence*, without any countervailing advantage whatsoever.

It was, and is still, proved by Mr. Johnson, that repeated and heavy crops of grass are obtained by the *clear* water of house sewage, filtered only by the earth of a sloping bank adjoining the land; and at Edinburgh the same, or even greater, results have for many years been obtained by entire sewage made to irrigate the adjoining grass lands. Every week's observation in this locality, it seems to me, affords convincing evidence that any and every attempt to deodorize and precipitate the solid matters of town drainage for the use of farm and garden land, at the cost and loss of the really valuable filtered liquid, must be founded in misconception of true chemical principles. I do not attempt to offer an opinion respecting the mechanical agency employed to convey the sewage to land distant from its outfall. Mr. Meehi and other gentlemen have been sufficiently explicit on the subject; but as to the value of solid sewage matter, incorporated, as it is rendered, with peat carbon, chalky matter, gypsum (sulphate of lime), &c., &c., it becomes proper to see what Dr. Anderson has disclosed on the subject in order to forewarn of the consequences those authorities who may hereafter undertake the thorough drainage of any city or town, without sufficiently providing an effective *outfall* and *unoffensive* recipient of the daily sewage.

At p. 279 of the *Journal of Agriculture* for March, 1854, there commences an article "*On the Mode in which the Sewerage of Towns may be most profitably employed as a Manure*," from which are selected the following passages:—1st, page 280. "The sewerage waters of London have been analyzed by Professor Way, and those of Edinburgh and of Morningside Lunatic Asylum have been analyzed in my laboratory. It is manifest that the constituents, viewed as a manure, which have the highest value, are the same as those that are of the most importance in any other manure, and that its value must be estimated by the proportion of *ammonia*, phosphoric acid, and potash which it contains. These three exist in it, partly in solution and partly in suspension. Supposing, then, a quantity of sewerage water to be left at rest, it will separate itself into two parts—a *deposit*, containing the greater part of the phosphoric acid, and lime, and very little *ammonia*; and a more or less clear fluid, containing almost the whole of the

latter substance, of the *potash*, and very little if any phosphoric acid. It appears that the quantities in pounds in 10,000 gallons, and their values, are as follows:—

	EDINBURGH.				MORNINGSIDE.			
	Quantity.		Value.		Quantity.		Value.	
	lbs.	oz.	s.	d.	lbs.	oz.	s.	d.
Ammonia.....	11	0	5	6	4	5	2	3
Potash.....	4	1	0	9	2	0	0	4½
Phosphoric acid.	8	8	1	1	3	8	0	5½
Total value.....	7 4				3 1			

From this it appears that little more than *one-sixth* of the whole value is contained in the insoluble parts of the sewerage, the other *five-sixths* existing in solution; and it is therefore obvious that, unless the plans by which sewerage water is to be rendered available make use of that part which exists in solution, they must be of little value."

Dr. Anderson proceeds to detail the four methods that have been proposed by parties with the above view, thus—

1. *Filtration*.—This he pronounces "radically bad," as, by calculations from the composition of the Edinburgh sewerage, it appears that it would be necessary to pass through the filters about 40,000 gallons in order to obtain a quantity of valuable matters equivalent to 1 cwt. of Saldanha Bay guano.

2. *Filtration through absorbent matters*.—Peat charcoal is the substance which has been held up as the most important for this purpose, under the erroneous impression that, because it deodorizes sewerage passed through it, it must also have retained its *soluble* constituents. Numerous practical objections also present themselves to the use of sawdust, spent tan, burnt clay, &c. Even if they did prove absorbent, they would add so much to the bulk and weight of the product as completely to counterbalance any advantage produced by their slight absorbent quality.

3. *Precipitation*.—The substances employed have been various; but lime and some of the cheap refuse salts of certain manufactories are among those that have been proposed. The projectors of the various precipitation plans seem to have overlooked a main difficulty, namely, that, "even granting that *all* the

valuable matters were deposited by means of certain substances added, all is not yet done: the matters are left at the bottom of the tanks, in the form of a wet sludge, which could not be lifted with spades, and would require some process of artificial drying."

At this point I must observe that I myself inspected a quantity of sewage *solids* which had been sent for trial to a farmer south of Croydon. Lime had been one, at least, of the precipitating agents, and the mass was so intractable as to defy manipulation. After some months, in 1853, and even till the middle of March last, it was not sufficiently reduced to admit of being thrown over the land. There is now an attempt being made at Croydon outfall to purify the liquid sewage by certain precipitants, whereby it should appear that the difficulty complained of by Dr. Anderson is obviated, and a black mass of the solid deposit (after being artificially *dried by heat*) is left in a completely light condition, so much so as to be readily strewn over the land, or incorporated with the manure of the farm. Till the existing trial be completed, it would be premature to offer an opinion of its probable results.

Recurring to Dr. Anderson, we read—

4. On the fourth head, namely, *The Application of Sewerage by Pipes or Drains, in the liquid form*, I have no hesitation in expressing my opinion that, if it is to be rendered available in any way, it must be by this. It is clearly on this system only that all the valuable matter can be turned into account, and that *in the form most suitable to the plant*. The whole thing, as most commonly occurs in such cases, resolves itself into a money question—Can sewerage water be profitably applied by means of pipes (for it is manifestly pipes, and not open drains, which must be employed) or can it not? For my own part, I think that pipes, judiciously applied, might prove successful.

Here—after taking so much liberty with this valuable article, and yet after great curtailment, and having dealt faithfully by it almost to the letter—I close, as I began, by referring our readers to the debates reported in the *Mark Lane Express*; which, in fact, comprise *all* that has been most recently made public on a subject of deep and exacting interest.

ON THE CULTURE OF THE FIELD CARROT.

There are numerous varieties and sub-varieties in the carrot tribe. Like all other plants designed for field culture, it has passed through many gradations, and under the fostering care of scientific growers it has been wonderfully improved in its nature and the abundance of its produce. Such is the productiveness of the carrot crop under the best culture, that

few others can equal it. The potato crop cannot yield so large a return per acre, nor will the food of the potato bear a comparison in its fattening qualities with the carrot, besides its freedom from disease. It will also bear comparison with either the mangold wurzel or turnip crop: it is a far more valuable crop than either of them, and will yield pretty near

as much weight of food per acre. The carrot crop has been known to produce 40 tons per acre, and frequently 30 tons are obtained. The average yield, however, on good soils and fair crops is from 12 to 25 tons per acre.

Variety.—The varieties generally grown in field-culture are the Long Orange field carrot, the Improved Altringham carrot, and the White Belgian carrot. I have grown these varieties, but am quite at a loss as to their respective merits: I believe them to be of equal value. I certainly had most profit from the White Belgian, but it was more owing to the soil and season than to the variety; moreover, the red varieties appear to retain most favour with the public, and, of course, meet with a more ready sale at fuller prices: for farm service this is immaterial.

Soil.—The soils best suited to the profitable culture of carrots are deep rich loams of moderate consistency, and rich reclaimed bogs: good sandy loams are well adapted for their culture: light sands and gravels, if well manured and pulverized to a considerable depth, will produce good crops; indeed, any soil of sufficient richness, and that can be cultivated to the depth of 8 to 12 inches, will bring admirable crops.

Preparation of Soil.—To insure a crop of carrots the land must be thoroughly worked and well pulverized to a considerable depth (not less than ten inches will suffice by any means); it must be cleaned as much as possible from all root weeds, and the annuals must, if practicable, be made to vegetate, and then be destroyed before the carrot seed is sown, otherwise much difficulty ensues. The manuring should consist of old well-fermented dung; and if applied early in the spring, and then ploughed in and well incorporated with the soil, all the better: it will tend much to prevent the growth of "fangs," instead of the long roots. Should this be inconvenient, the common ordinary manuring may take place immediately before sowing, to be well and deeply ploughed in and rolled down with a rather light field roller. It is not desirable to plant carrots on ridges, but on the flat they are less fangy, and, of course, more valuable.

Preparation of Seed.—This is of more importance than is generally given to it. The seed should be mixed with earth, coal ashes, sand, or like material. Bone-dust, rape-cake, or some of the new manufactured manures might with advantage be substituted, the object being to separate the seeds for drilling, while at the same time by a slight moistening they may be made to vegetate. This mixture, with a few grains of barley or white mustard thrown in, to mark the rows by its early growth, may be made, and regulated according to the quantity which the drill is known best to deposit: it is of no consequence as to the quantity of the mixture, providing the whole is

evenly mixed: it is merely drilling in so much manure with the seed to promote its more rapid growth. From three to five pounds of seed are requisite for an acre.

Drilling.—This may be very satisfactorily done by any good manure-drill capable of drilling-in mangold wurzel seeds, or turnips; or, if only a small mixture, say two or three bushels, is made, the common corn drill will do very well. The distance between the rows should be about twelve to fourteen inches, and the depth about one inch. If the land is dry and season unpropitious, it is best to roll or slightly harrow in; but if rain is likely to fall, it is best to leave the drills open. The months of April and May are best for sowing.

After-culture.—This mainly consists of weeding, hoeing, and singling. These should all be done by hand, and as often as required. The first hoeing should be between the rows, and to take place as soon as the rows are discoverable; the next should be when the plants are sufficiently high to allow the hoe to be struck across the rows, so as to leave the healthy plants about six inches apart along the rows, sooner a little wider than less, as it is proved that a reasonable width apart gives the greater yield and finer roots. The weeding and singling should soon follow, when probably, if the land has been nicely managed, another hoeing in the month of June or early in July may complete the culture. Wide drilling and horse-hoeing are not applicable to the carrot crop. The young plant is of too tender growth, and requires careful nursing and continuous attention.

Storing.—This is an expensive process, and is the great objection to carrot cultivation. It begins in October, and it can only be properly done by digging up the roots either with a three-pronged fork or other tool: they must then be gathered into carts, and led to the grave, and piled up as described for mangold wurzel or potatoes. Carrots are more subject to take heat than most other roots, and will require greater care in storing: the heaps or graves must not be too large, or raised too high, nor covered down too thickly. They should have ventilating holes in the grave as long as the season will allow. The tops should be carefully cut off above the crown before digging, and taken to stock for immediate consumption. Burrows, in his communications to the Board of Agriculture, says—"The carrots keep best in the ground, nor can the severest frosts do them any material injury." He prefers to let them remain in the ground till March, when they are taken up in dry weather, and stored as above.

Application.—The carrot abounds in nutritive matter, and does not require any process beyond cleaning to prepare it for food for cattle, horses, &c.: no steaming, no boiling. It is the most valuable of

all roots for horses, and is proved to fatten cattle faster, and even cheaper, than turnips. The proper allowance of carrots for a horse is from 50 to 70 lbs. per day. All stock thrive well upon them. Cattle,

sheep, and pigs fatten faster upon them than any other roots. If grown for sale, it is very valuable, making from £3 10s. to £4 per ton in the London market.

ON THE CULTURE OF BEANS.

Can the bean be considered a fertilizing, or is it an impoverishing crop? It is commonly received amongst farmers that it is not at any rate an exhausting crop, that it is rather ameliorating, and that it prepares a soil better almost than any other crop for wheat. And yet chemists show us that it takes off from the soil absolutely more nitrogenous matter than any other crop of a similar kind—we mean corn, grain, and pulse. Thus a produce of 30 bushels of beans per acre will remove say 490 lbs. of nitrogenised or flesh-forming substance, while the same quantity of wheat per acre will remove only 260 lbs.; of barley, 40 bushels will remove 280 lbs.; of oats, the same quantity will take away 275 lbs.

Though there have not been, that we are aware, any investigations into the organic composition of the bean-straw, there is no doubt that it is highly nitrogenous also. Pea-straw, a material of the same class, shows nitrogenous matter about 8 times as great as the straw of wheat per acre, 10 times as much as oats, and about 15 times as much as that of barley. Hence, then, it is a de-azotising crop, both in the grain and in the straw, taken per acre—the most certain mode of calculating such articles of produce.

Theory immediately says, chemistry therefore has decided the bean to be an exhausting crop; and the reason why farmers so advocate it is just the same as induces them to advocate the growth of any corn crop which they know deteriorates the soil in its permanent effect, but puts money immediately into their pocket. But we are not prepared to subscribe even to this, plausible as it may seem; what we mean to say practically is this, that *when properly cultivated*, the bean is not an impoverishing crop, *but the reverse*.

A very few physiological and practical facts will easily set us right on this point, and obviate the great objection some landowners have to see beans cultivated even on soils where the clover has got worn out, and where the bean is used, and most successfully, as a substitute for that plant.

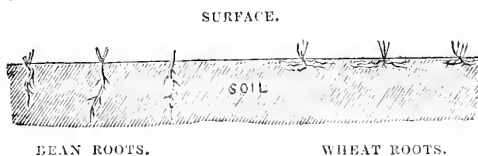
The bean has a large leaf system. Hence it derives a large portion of its element from the atmosphere. Treating leaves as the lungs of the plant, and knowing that the turnip, the clover, and others derive a proportion of nourishment from the atmos-

phere almost, we had said, in the ratio of a large or a small leaf development, we easily see how the clover, even when all mown off, is not much of an exhauster; while the wheat or the oats, having a small and feeble leaf system, will take most from the soil.

Nor are we altogether to forget the benefit of the shelter of the bean leaves. The moisture or the ammonia may fall on the soil. In many cases, a hot sun may evaporate the one, and dissipate the other; the beans will, in the very reverse, shelter the soil till both are absorbed. And these leaves fall off. It is known how planting even with trees, which take off tons of inorganic matter, will enrich a soil in vegetable constituents. The fall of the leaves, year after year, which are mostly formed of carbon and moisture, forms a superstructure of soil rich in vegetable matter. So the bean leaves fall off at harvest, by frosts or from ripeness; and these all assist in improving the carbonaceous matter of the soil, and so fitting it at least for some kinds of crops.

The bean is a deep tap-root feeder. Corn of all kinds permeate the surface soil with fine, small spreading filaments of roots. Deeper, it is true, it might go, if the soil were deeper worked and pulverized, and if there were more inducements; but in ordinary circumstances, it is a shallow spreading root-feeder. The bean is the reverse. Its deep feeding root strikes directly down, and it is only at the lower parts of that root that the sponge-like are sent out. It derives its food, in fact, from a different part of the soil, so far as the root is concerned; and therefore it may be said to have a mode of supply altogether different from the corn crops, which usually follow it.

The following very simple sketch will show this to demonstration.



But we must not be led away to forget the saving clause of proper cultivation. It is not the mere drilling or dibbling or broadcast sowing of beans we now object to, or recommend. If the bean is a deep

feeder, it must be assisted to get food where the root really goes. Hence all good farmers *ridge their beans* and in the ridges put some fertilizing matter. All manures covered by the soil have a natural tendency downwards; and hence the bean root will follow the manure deposited in the furrow, and the bean planted above it.

Not only so, but as the leaves are a great means of supplying the plant with food, they must have plenty of room to expand. Beans must be *sown in wide ridges*. We have seen good—at 30 inches; we have seen excellent at 32 inches; but they ought never to be less than 27 inches, and if properly cultivated they will meet at these widths long before harvest. But the soil between must not be neglected, otherwise it will grow weeds, which will not only impoverish the soil, unfitting it for a future crop, but injure the progress of the beans themselves. Hence the horse and hand-hoe must be liberally applied; or what is better, the grubber, or even the plough itself, may be used with advantage. Here, there is both a crop and a fallow in the same year: the surface soil is being cleaned and pulverized, while the subsoil is enriched and growing a crop. Hence the bean crop, when properly managed, *derives its nourishment from the subsoil, while the surface soil is being fallowed, sheltered, and improved for the wheat crop*.

Practice steps in, therefore, and shows that mere closet chemistry can never unravel the secrets of the true position of the bean crop.

To landowners and farmers who object to the insertion of this as a substitute for clover on light lands, the principles above will be an easy ground for the construction of agreements, so as to secure the fertility of the soil; for the removal of the clover from its like for eight, or it may be ten, instead of four or five years, will leave the soil in the best possible condition for the future growth of that crop.

On clay soils, moreover, the ameliorations of the soil—the working of the surface soil by the grubber, the horse hoe, or the plough, with the permeation of the subsoil by the roots of the bean, are of almost invaluable importance.

The losses from failure of the bean crop may act in a manner to deter some timid parties from engaging in their cultivation. We shall in our next show how the several diseases of the bean may be remedied.

DISEASES OF BEANS.

We promised some remarks on the diseases of beans. They are so subject, from their extreme succulency, to diseases of different kinds, and to

attacks of more than one description of insects, that some parties are afraid of growing them. This arises doubtless mainly from their albuminous or nitrogenous character—highly nitrogenised vegetables being far more likely to take an incipient decay, and to be a temptation to the insect world, than less nourishing materials. We stated before that we knew of no analysis of bean-straw, but took pea-straw as an analogous product, to illustrate our remarks on the highly nitrogenised character of the plant. Since the date of our last remarks, we find from analysis by Professor Way, which not only bears out our remarks most strongly, but shows that we might even have gone much further; it so far, therefore, strengthens our argument. We give, below, the analysis of pea-straw, and the recent one of Professor Way, made Feb., 1854.

	Pea-straw.	Bean-straw.
Water	12	14.47
Woody fibre	25	25.84
Starch, gum, &c.,	45	31.63
Oil	1.5	2.28
Albuminous matter	12.3	14.47
Mineral ingredients	5	9.45

There are three stages of the plant, in which different kinds of attack prevail. The first is in the state immediately after the spring beans are above ground, in which a grey weevil (the *Curculio lineatus*) makes sad havoc by eating the leaves—appearing in March, and being still more destructive in April. They feed during the day, and escape under the small stones and clods of earth during the night, and drop down like many other kinds of insects when approached. On the soil they are hard to distinguish, being of a light-grey colour. They do not jump, so are not easily taken; but simply fall off, and being of a dry bright shining description, are covered with a coat of mail, on which oil only will perhaps make any impression, by clogging up the spornules. But as oil is entirely out of the question, the only thing the farmer can do is to render the leaves too unpalatable for the insects; and hence a careful dusting of quicklime while the dew is on the grass will often induce the insects to fly off, or to feed at least so slightly, as to allow the beans to get too strong for them to make any impression upon, till they can do little injury.

It is not the spring beans alone which suffer. For though the attacks are principally on these, yet in 1853 for the first time we observed them making sad havoc with winter beans, and recommended the lime treatment above described, which completely saved the crop—they were very much reduced, and during some of the east winds so latterly prevalent in April were suffering much. The spring beans were almost ruined in 1844 by this pest, and we shall not be surprised if a visitation now take place of a similar description.

The next insect attack of much consequence is one before which the whole bean crop of a district will sometimes be sacrificed; and it most frequently happens, if the weather is very changeable, especially from dry to wet, and dry again sets in, there is almost certain to be a visitation of aphides. These usually appear early in June, and stick to the necks of the top-shoots, sucking out all the juices; and though a few may appear at first, they soon spread not by millions, but by myriads as countless as the motes in a sunbeam; and to complete the whole, a week after the attack the crawling wingless lice are succeeded by winged flies—the same as the miscalled cholera flies of September last, which were in fact the aphides of the turnip. Those on the beans are easily observable, being not green like most other plant-lice, and so hidden from observation by their colour so nearly resembling the plant they feed upon; but of a black colour, and have hence got the name of “collier”—but are more frequently called “dolphin” or smother fly.

Now for these there is but one remedy. They breed with the rapidity of the wildest flight of the imagination, but can only feed on the recently grown and tender parts, being so delicate that the suckers cannot penetrate into any very solid part of the plant.

The farmer must at once cut off all the infested heads, though they may be only an inch above the flowers, and though the flowers left may be few; this amputation must be relentlessly and assiduously performed on the whole crop, while the insects are in the apterous or wingless state; for if they attain the dipterous, they ascend the plant far more easily,

and may still do some injury on the recent side-shoots. In 1833, the bean crops in the north of England suffered just as much or more from these as in 1844 from the weevil. If happily the visitation should be kept off till July, the crop may be altogether saved by this decapitation.

The third and even less manageable disease to which beans are subject, is the mildew; often, indeed, a result of the last-named attack, but sometimes, so far as we can see, quite distinct.

This is usually a fault in the soil or management, and generally arises from a disproportion of the nitrogenous to the saline and carbonaceous manure in the soil. Though the bean plant seems to require less mineral manure—we are speaking practically—than many other crops, it will be weak and sickly if it have not enough of carbonaceous; but if the nitrogenous be in any great excess, the plant will obtain a very gross appearance at spring, will increase in large tall stems, and very dark green leaves, but will instead of “coming” be “all top,” and take the mildew. The full cultivation of the interstices of the drills will often organise and liberate mineral matters enough for the plant; but it is difficult to supply the carbonaceous part after the plant is grown. Possibly a dressing of charcoal might absorb and hold some small part of the ammoniacal matter, or a lime dressing, scuffled in, might fix it, so as to prevent injury; but the safest method is to grow some other crop, as turnips, for instance, if it can be done, instead of the beans; or rape or mustard may be tried, if turnips are objectionable. Mildew, in all kinds of crops, is, however, the most difficult of all enemies to understand or to grapple with.

AGRICULTURAL GEOLOGY.

Our recent reference to a discussion in the *Probus Farmers' Club* has reminded a gentleman, who sometimes favours us with contributions, of a promise made more than a year ago, and as yet unfulfilled. It appears that, at a meeting of that club, Mr. Whitley, the author of a work on agricultural geology, complained of what he considered an unfair critique on his book, which had appeared in the columns of a contemporary nearly eight years before, and which he attributed to a rival author on the same subject. We had the authority of the real writer of the article complained of for denying this, for declaring that Mr. Whitley's book should be reconsidered, and for promising that if injustice had been done elsewhere, reparation should be made in our columns. The gentleman in question has at length enabled us to redeem this pledge.

“I have carefully,” he says, “read Mr. Whitley's book; and with regard to its contents (from p. 19 to the end) I adhere to my former opinion, that it is chiefly a compilation. The most valuable part of the book consists of a few pages (pp. 9 to 14), in which the author describes the alternations in the superficial deposits which constitute the soil in several parts of Cornwall. These show Mr. Whitley to be a good observer, and render it probable that if he could have freed himself from the trammels imposed by the attempt to treat so wide a subject as the agricultural geology of the whole island, on the authority of those who had preceded him, and had contented himself with original investigations in a limited district, he would have anticipated others in establishing the important influence of the superficial deposits on the distribu-

tion of soils, and would have been the first to draw attention to a class of those deposits which had, till lately, escaped notice. As it is, he has involved himself in much confusion and contradiction between the formation of the soil by decomposition on the spot, which he adopts on the authority of previous writers, and its formation by aqueous transport, of which he could not but see evidence. Had he followed such a course, instead of asserting, as he has, that geological maps, as at present constructed, which omit the superficial deposits, will be found valuable in selecting an estate for purchase, he would have told us that while the mineral characters of the rock formations define the general agricultural features of a country, there are on each of them soils of every variety of quality, independent of variations in the composition of the rock, and that our present geological maps afford no criterion by which a purchaser may know whether an estate on any formation is worth a rent of less than 10s. an acre, or more than 50s."

In support of these allegations, we would refer the reader to the following passages:—At page 7, the formation of the soil on the spot, by the crumbling of the rock on which it rests, is denied; and its formation by "diluvial action" is contended for. These views are illustrated by some interesting sections, showing alternations of deposit to a considerable depth, in Cornwall, a district which exhibits few, if any, traces of the erratic tertiaries, or northern drift, formerly ascribed to diluvial action. These sections represent those deposits which constitute the "head" of some geologists; the "angular drift" of Sir R. Murchison, and which Mr. Trimmer had previously described under the name of "warp drift." That gentleman, however, must concede to Mr. Whitley, the merit of priority in pointing out this deposit as a local fact; though, from the confusion in which he involved the subject, he deprived the discovery of all value, except as independent and corroborative evidence, when rightly interpreted, of what has been announced as a general truth—the existence of a class of deposits different from the erratic tertiaries, of subsequent origin, the result of a minor degree of transportation, by which the materials of more than one formation have been blended, and by which these variations of soil on every rock formation to which we have alluded have been formed, which are dependent—not on the composition of the rock beneath, but on the form of surface.

The dependence of these variations or contours is virtually stated by Mr. Whitley in the following terms, viz.—

"We find on the brow of a hill the soil thin and scanty; whilst in the adjoining land, which has a concave surface, it is deep and loamy. It is not in

the immediate neighbourhood of rocks which have been weathered that we find the deepest soil, but in sheltered situations and basin-shaped valleys. Thus the sides of hills are not covered with so deep a soil as the plains; and these, again, possess much less than the valleys."

Atmospheric action is considered inadequate to produce these phenomena, which he supposes to indicate the following operations—

1. That the surface of the earth has been worn away by the violent action of water, breaking up its outer crust, and holding in suspension the earthy and clayey materials of which the soil is composed.

2. That large portions of the earth's surface have been swept away from their original position, and deposited at lower levels.

3. That the arrangement of materials according to gravity, and the water-worn fragments of rocks found in *layers* in the soil, lead to the conclusion that it has been formed by sedimentary deposition.

We would remind our readers that Mr. Whitley is describing a country in which the glaciomarine deposits of the northern drift, or erratic tertiaries, are not found, and which is the stronghold of those who derive soils from the decomposition of the rock below by atmospheric action. The soils of this district must therefore be either "warp-drift" or the result of atmospheric decomposition *in situ*. Mr. Whitley has proved that it is not the latter; and yet, delivering himself up to the guidance of those writers on agricultural geology who had preceded him, he declares, at p. 17, that the same mineral constituents which enter into the composition of the rock will be found in the soil, and any marked colour peculiar to the one will be communicated to the other; so that soils on the chalk will be white, on the red-sandstone red, and on the clay-slate yellow. Again, at p. 19, we are told that, having shown the derivation of the soils from the subjacent rock, it is the province of agricultural geology to point out the amount of fertility which the different parent rocks confer; and the following are announced as general principles:

The depth of soil is dependent on the easily decomposable nature of the rock.

The texture depends principally on the tendency of the rock to crumble into a gritty or clayey state.

The fertility of a soil, where it has a good texture, depends upon the rock possessing the mineral constituents which enter into the structure of plants.

Upon these principles, he proceeds to examine the soils of the various geological formations; and thus, having proved that in Cornwall, where the erratic tertiaries ("diluvium") are not found, the soils have been formed by aqueous transport ("diluvial action"), he sallies forth into those regions where the

rocks are covered by extensive and deep deposits of those tertiaries, and treats the variations of soils as if they were derived immediately from the rock below, unmodified by transporting agencies, which have brought the materials of many rocks from much greater distances than any transporting agency which has affected the hill sides of Cornwall.

Our correspondent concludes with the following remark:—Nevertheless, Mr. Whitley is, as I have said, a good observer. His observations led him very nearly to what I believe is the truth, and would have led him to the truth itself had he not followed the guidance of others. If he will confine himself to original observations—if he will forget all he has read of theories respecting the formation of soils, as well as all he has himself written on the subject—he is well able to render important service to the cause of agricultural geology.

We have received from the writer of the article on Mr. Whitley's work on *Agricultural Geology*, the following communication, in which he ventures to suggest to that gentleman, and to others equally competent for the undertaking, the true method of determining the relations between the variations of soil and the rocks on which it rests:—

"We have had enough," he says, "of treatises on *Agricultural Geology*, in which old errors are repeated from writer to writer; and soils are tortured in every possible way, in order to make them accommodate themselves to the theory that, the geological formation being given, the quality of all the land upon it is given also. What we want is, maps of the actual variations of soil, for comparison with maps of the rocks—that is to say, with the best geological maps, constructed to show the rock which would be the surface if the surface were removed; the loose covering thus supposed to be removed constituting, in point of fact, in most cases the soil, and in many the subsoil also.

"Public maps of soils, properly constructed, and on a scale sufficiently large, would have considerable practical value, by guiding intending purchasers and renters to those districts in which they would find land suited to their wants. They would not, however, supersede the necessity for private geological maps of estates, which would show the variations of soil dependent on the superficial accumulations, and would show also the mineral variations of the rocks themselves with more minuteness of detail than is possible on any public map. They would likewise throw much light on highly interesting, but, at present, very obscure problems in theoretical geology."

Of all the periods in the long and eventful history of our planet, there is none respecting which geologists really know less than that which intervened between the disappearance of the mammoth,

the rhinoceros, the hippopotamus, and the hyena from England, and the entrance of man upon the scene. Of all the changes which have modified the surface of the earth, that respecting which we know the least, and from the investigation of which the majority of geologists shrink as the most difficult, is, that which is the most recent. And yet they profess adherence to the philosophical rule of proceeding from the known to the unknown. It is time this reproach was removed from the science; and agricultural geologists are the men to remove it—not by framing theories, but by collecting facts. It is impossible for them to lay down the variations of soil on maps, and to collect sections of the internal structure of the soil and subsoil—such as Mr. Whitley gave in his book—without furnishing materials for the solution of such questions as the following: Have soils been formed on the spots on which they lie, by the mere crumbling of the subjacent rock; or do they contain the materials of more than one formation, blended by aqueous transport? Has there been more than one such transportation of materials, to form the loose covering of the earth? What was their direction, and what was their nature? Were they merely existing agencies acting with their present intensity, or were they analogous in kind but different in degree?

Here then is a wide field open for original research. It is a field to which the majority of geologists are not competent, because they know nothing about soils. It is a work to which any intelligent land-surveyors are competent; and not the less so because they are not geologists: for that very reason they are the more likely to lay down the actual variations of soils with freedom from bias in favour of any of the geological views prevalent at present.

There are few districts better adapted for such work than Cornwall and Devonshire; because the erratic tertiaries, under their two forms of boulder clay and rolled gravel, do not extend into them. They consequently are the stronghold of those who maintain the substratal origin of soils.

If their theory breaks down there, where those formations are absent, it is vain to attempt to extend it into districts where the erratic tertiaries confessedly cover large areas with deposits of great depth.

Such a map should not be on a smaller scale than that of two inches to the mile. The Ordnance sheets enlarged to that scale, and corrected to the present state of the ground, would serve for its basis. It would not supersede, as we have already said, private geological maps of estates, but would be the precursor of them. We would ask Mr. Whitley, then, if he is willing to undertake the con-

struction of a map of the soils of Cornwall and Devon, or either of them? If not prepared to execute the whole, is he disposed to undertake a portion of the district? If so, we will put him in communication with others, who will be ready to cooperate with him, and will be glad of his assistance.

AGRICULTURAL BIOGRAPHY.

(Continued from page 311.)

CCCCXVII.—COLLYNS, 1827.

W. Collyns, Esq., surgeon, Kenton, near Exeter, wrote "Ten minutes' advice to my neighbours, on the use and abuse of salt as a manure;" Exeter, pamph., 8vo. Loudon mentions this work, which is not found in the National Library.

CCCCXVIII.—MEADOWS, 1828.

Arthur Meadows, Esq., wrote "Hints to the farmers of the baronies of Forth and Bergy, on the cultivation of mangel wurzel, beans, carrots, and parsnips;" Wexford, 8vo. Loudon's list of writers is the sole authority for this book and author, neither of whom is found in the National Library. When this circumstance occurs, no opinion is expressed of the work, and the authority is merely stated.

CCCCXIX.—KENNEDY, 1828.

Lewis Kennedy, Esq., son of Mr. Kennedy, the late eminent nurseman, of Hammersmith, steward to Lord Willoughby D'Eresby, wrote "The present state of the tenancy of land in Great Britain, showing the principal customs and practices of counties between the in-coming and out-going tenants;" assisted by J. B. Grainger; two parts, 8vo., London, 1828. The first part is on different modes of tenancy; the second on wool-growth, value and policy of the trade. This is an interesting and very useful work, and performed with much fidelity, save the crotchety opinions of the nation being ruined by any freedom anent corn and wool. These opinions were the prevailing fashion of the day, and the authors inherited only a fair share. The customs of the counties convey much instruction on the points of utility and disadvantage. The introduction of the work has the most unusual length of 129 pages: vast calculations are there made of the losses that would ensue from the most trifling change, which deserve not any notice, as events have falsified every ground of assumption. Any practical work is much defaced by these assumed materials of use; and as no certainty can exist, the conclusions must be received with great caution. The authors had not to calculate and predict, but to examine and report; not to denounce perpetual mischief, but to suggest from seeming evils some beneficial alterations. It may have been

thought to please the politics of the late Duke of Wellington, to whom the work is dedicated.

The author wrote "On the cultivation of the waste lands of the United Kingdom, for the purpose of employing the poor, and diminishing the poor-rates;" London, 8vo., 1829. There are 66 pages in this essay, which argues to establish what never was doubted—that the land must maintain the people by means of labour and rates; and it only remains to construct the machinery, adjust the parts, and regulate the performance. The difficulty lies in the arrangements; and until one competent architect be found to build a social system to comprehend these resolutions, the enigma may still remain of lands untilled and a people starving—a true paradox, and of long continuance.

CCCCXX.—LUPTUNE, 1828.

Luptune wrote "Hints on manures;" 12mo., price 3s. This notice appears in the London catalogue of books; no other list of books or authors has the name in print.

CCCCXXI.—LAMBERT, 1829.

Joseph Lambert, Esq., wrote "Observations on the rural affairs of Ireland, or a practical treatise on farming, planting, and gardening, adapted to the circumstances, resources, soil, and climate of the country;" Dublin, 8vo., 1829. The work occupies 327 pages, with a medium introduction. The contents are valuable, describing many subjects in a very handsome and practical manner, and with much candour and benevolent feeling. The outset observations on farming are most correct, and show the author's knowledge of the subject to have been truly honest. The matters are very much mixed; roads, draining, hay-making, burning lands, ploughing, grasses, pasture, stall-feeding, breeding, sheep, swine, grains, legumes, roots, gates, and timbers. There follow observations on bogs and wastes, and on planting: ornamental gardening concludes the volume.

This miscellaneous way of writing has its advantages, and is not without its use; it relieves the dulness of reading a long subject, and conveys the meaning in a more lively and forcible manner. The transition from one subject to another shows a largeness of information on the part of the author,

and an eagerness to impart the knowledge that is possessed. The writer of the present work has shown an adeptness in this way; and the manner in which he has discharged his undertaking does not reflect any disgrace on the mode he has adopted to convey the information. He seems to be unknown, except in the appellation above given.

CCCCXXII.—STEPHENS, 1829.

George Stephens, drainer, member of several foreign societies, wrote "The practical irrigator, being an account of the utility, formation, and management of irrigated meadows, with a particular account of success of irrigation in Scotland;" to which is added a practical treatise on straightening water-courses, protecting river banks, and embanking lowlands, Edin., 1829, 8vo. The work comprehends 195 pages, and describes very practically the common formation of water meadows in float and catchwork, and the great value of that mode of improving the value of lands. No great success ever attended irrigation in Scotland; the practice of it was ever very small. The author's extent of knowledge in draining amounts to bogs and swamps, and to intercepting the springs of water that rise from permeable strata; the frequent system of modern draining had not occurred to the practice of those times, and in which the carrying away of surface-water supersedes the catching for intercepting of the permeating flows in the underground. On the subjects that are treated, no better work has ever appeared; but being limited in the comprehension, the value is proportionally decreased. Elkington's mode of tapping springs of water by boring into the tail of the conveying stratum, and the intercepting of outlets by a trench cut below the gurgles of water, have all given way to more certain methods of performing the purpose.

CCCCXXIII.—DOYLE, 1829.

Martin Doyle wrote "A cyclopædia of practical husbandry and rural affairs in general;" Dublin, post 8vo., price 12s. The book comprehends 507 octavo pages, and treats the subjects in the alphabetical order; the intelligence is very plain and practical, but sufficiently enlightened. The portraits of the animals are bad; but the designs of cottages are elevated to the bed-rooms being placed on the second floor, which shows the ideas of the author were raised beyond the common grovelling on that subject. The book is dedicated to the Marquis of Downshire, and we believe the author was an Irish clergyman, and wrote several little works on farming and gardens. There is not shown any progress in ideal practice or a large comprehension of the art of agriculture, but merely a plain and very sensible matter-of-fact exposition of current

and known intelligence in a very acceptable and useful manner. The author had read much, and quotes largely.

CCCCXXIV.—HARLEY, 1829.

William Harley wrote "The Harleian dairy system, and an account of the various methods of dairy husbandry pursued by the Dutch; also a new and improved mode of ventilating stables, with an appendix containing useful hints (founded on the author's experience) for the management of hedge-row fences, fruit trees, &c., and the means of rendering barren lands fruitful;" London, 8vo., 1829. The author was originally a manufacturer in Glasgow, and afterwards an extensive cow-keeper and builder there. He died in 1830.

The volume contains 288 octavo pages, the plan of the cow-house, and the portraits of an Ayrshire bull and cow. Our inspection is again compelled to relate the vast inferiority of the Scotch artists in animal life; the present case is the worst that has occurred. A caricature is an appellation too gentle to convey an idea of the performance. The cowshed was on a magnificent scale, with stone cribs and cast-iron troughs, and much contrivance to collect the urinary feces. The soiling system was adopted, and much convenience was devised. The piggery is very deficient in contrivance, being the common sty and yard under a low roof, and without any adjoining yard for the dung. The upper storey of the cowhouse was designed into apartments for containing litter, and sleeping-rooms for the attendants. The establishment did not last very long; such costly doings fail in competition with the humble dealer, who is able to produce the articles at less cost, and is the successful competitor. It matters not in such cases if the cows are tied to stakes of iron or timber, or if the feet are placed on a stone or wooden pavement; if the chains round the neck of the animal is attached to a pulley or by a ring to the stake. These arrangements show only an ingenuity which is pleasing to the fancy, and to be looked at in use; but the milk is no way affected by the articles, and the cost adds a heavy sum on which the interest of the capital has to be computed. But such executions always show something for adoption, and are not wholly useless.

CCCCXXV.—FALL, 1829.

Thomas Fall, surveyor of roads, wrote "The surveyor's guide, or every man his own road-maker, containing the whole art of making and repairing roads, prices for work, forming of estimates, and office of surveyor;" Retford, 12mo. The work contains 163 pages of duodecimo, and is a most valuable treatise; nineteen sections give the best directions that are known on the subject of making

and repairing roads. The author uses one material for roads—a depth of small broken stones, with sharp points and angles, laid on the cart-way at three different times, according as the weight is settled in position. Twelve inches in depth of broken stones form a sufficient road. Surveyors and farmers will be much informed and repaid by the labour of perusing this little volume.

CCCCXXVI.—STRICKLAND, 1829.

G. Strickland, Esq., wrote "A discourse on the poor-laws of England and Scotland, on the poor of Ireland, and on emigration;" London, 8vo., 1829. This discourse occupies 127 pages, and is dedicated to the Marquis of Lansdowne; the author dates from Hildenley. The usual complaints are made of the great and growing evil of the poor-laws, and the remedies examined that have been offered for the mitigation, if not total abolition. The author is not sparing in rebuke of the promoters of new schemes, but does not seem ready with any plan of his own, and he leaves the subject as he found it—a truly repugnant idea to the name of civilized society. Whatever arrangements are made, the original and adherent character still remains.

CCCCXXVII.—LAWSON, 1829.

John Lawson, jun., Elgin, wrote "A treatise on smut in grain;" London, 1829, 8vo. The essay occupies 63 8vo. pages, with portraits of parts of different grains in the sound and diseased state. Smut in wheat is attributed to the luxuriance of the stem, which leaves wholly untouched the grand puzzle of sound and diseased stems proceeding from the same root, and smutted and sound grains being found on the same ear. The author reasons very acutely, and states his ideas very frankly, and gives many communicated opinions on the subject. But all opinions and theories have failed, and may probably ever fail to account for the above-stated appearance of soundness and disease springing from the same root, and being seated on the same spike.

CCCCXXVIII.—TRIMMER, 1829.

Joshua Kirby Trimmer wrote "Practical observations on the improvement of British fine wool, and the national advantages of the arable system of sheep husbandry;" London, 8vo., 1829. The author published in 1809 a work not generally quoted: "A brief inquiry into the present state of agriculture of the southern part of Ireland, and its influence on the manners and condition of the lower classes of the people, with some considerations upon the ecclesiastical establishment of that country." The author had visited Ireland on busi-

ness, and was struck with the usual painful feelings, from seeing the manner in which the poorer order of the inhabitants live. The inquiry occupies 80 pages, and is written in a very clear and feeling manner. Any suggestions offered in such cases are but as a drop in the bucket of the overwhelming mass of Ireland's misery.

The book on wool fills 80 octavo pages, and is divided into six chapters. The author states his success with the merino sheep, and had procured fine wool, and an animal equal to the Southdown breed. Much hand labour is bestowed in supporting an insecure edifice, of which the author lived to see the failure. No fineness of wool ever can supplant the flesh in the value of the English sheep. A hated fancy only is capable of overlooking this primary quality of use in Britain. The author had farmed extensively, and employed much business and observation on wool; his observations are very just and temperate, and conclusions legitimate. But the cause was false, and the whole edifice has crumbled. A want of caution and of cool reflection characterises these evaporation, and are the origin of the manifestations.

CCCCXXIX.—LAWSON, 1829.

A. Lawson wrote "The farmer's practical instructor, showing all the latest and most improved methods of cultivating the vegetable and animal productions of agriculture, embracing every subject of information necessary to constitute the complete farmer;" 8vo., plates, price 12s. This statement is taken from an advertised list of works on agriculture, new and secondhand; the book is not found in the National Library, nor is the author mentioned in Loudon's list of writers. The title of it is respectable, and the want of the work adds to the regret that any perusal should escape our notice and research. It is always pleasant to record any labour that is usefully directed.

CCCCXXX.—MONTEATH, 1829.

Robert Monteath was a person employed in Scotland in making reports and surveys of woods and plantations, and in designing and valuing the wooded ground of landed estates. He wrote "A new and easy system of draining and reclaiming the bogs and marshes of Ireland, with plans for improving waste lands in general;" London, 8vo., 1829. The book contains 239 pages of very mixed matter, with plates of remarkable trees at home and abroad. The author raises very high the profits of planting, but devised no more feasible mode of fertilizing the bogs of Ireland than others which had preceded, and had all fallen to the ground. The author wrote "On planting and rearing woods," and "The forester's guide."

CCCCXXI.—COBBETT, 1830.

William Cobbett was born in the year 1762, in the neighbourhood of Farnham, in the county of Surrey. His father was a small farmer of moderate education, but of very powerful natural abilities, and raised himself from a day labourer to the station of a farmer. Our author was the third son; and the house in which he was born is close beside the river Wey, and immediately opposite the bridge which passes over that little stream; it is known by the sign of "The Jolly Farmer," and kept as a road-side alehouse. The repairs done to the house have obliterated the marks of the former habitation. The children of such a parent were early trained to labour; and our author was employed in scaring small birds from the turnip-seeds, and crows from the peas and oats. His advancing age weeded the grain crops, and led the horses in the harrows. The father taught the sons in the evening to read and write, and imparted the knowledge he had collected. Our author very early showed a spirit of adventure, and quitted his father's house for ever at the age of twenty years. He had heard of the "world," and was resolved to see it. He got engaged as a copying clerk in London, from which, in 1784, he enlisted into the army, and was transported to Nova Scotia with the regiment of his choice. He had contracted a liking to general reading, and laboured hard to improve himself. This employment kept him out of mischief. He was always sober and regular in his attendance, by which he drew the notice of his superiors. He was made a corporal, and distinguished by a worsted knot upon his shoulder. He married, and returned to England with the regiment, and bringing with him a very excellent testimonial of his character from the colonel of the regiment. He was discharged in 1791, by his own most earnest request. He got a court martial instituted against four officers of the regiment for embezzlement of stores and false returns, but did not appear to prosecute on the day appointed—a conduct that has never been cleared up. He went to France, and hence to America. He began in Philadelphia to write on politics, and soon excited attention. He was variously employed, and opened a shop as bookseller. He raised much ill-will by his writings and proceedings, as a high Tory in politics. His scurrilous writings were fined in the sum of five thousand dollars, and Cobbett fled to New York. He returned to England in 1800. His royalist principles procured him notice, and he entered a business as printer and publisher. The writings attracted much attention; but some affront or misunderstanding induced him to desert Toryism, and he became a decided radical reformer. To the latter his birth and social circumstances must have in-

clined him. In 1805 he came out in the character of a reformer; and for 30 years he occupied a large notice of the busy world in political literature. He was convicted of libel, and fined more than once; but his works increased in value, and he purchased an estate in Hampshire. He offered himself as member of parliament, but failed in an election; he espoused the cause of Burdett, and steadily supported him, till some confusion in affairs estranged them. He was intimate with Major Cartwright, who paid him attention to his death. He was prosecuted for libel, condemned, and imprisoned for two years, and paid a fine of £1000. A place among felons much affected him, and he rescued himself by paying a weekly maintenance elsewhere. During his confinement his works proceeded; and when liberated, he was entertained by his friends at a public dinner, and then visited his family in Hampshire. On the suspension in Britain of the Habeas Corpus Act, he went to America in 1817, and settled himself near New York; he took a farm, and commenced his agricultural pursuits. He was now an altered person, a steady and unflinching reformer, instead of an admirer of monarchies and of crowned and noble pedigrees. In 1819, every property he had was consumed by fire; and he returned to England, and brought with him the locust tree, and the corn plant which was known by his name. He was arrested for an old debt, but bailed by his friends. He was again convicted of a personal libel, and heavily fined. His chief publication was now in the name of his son. He again failed to get into parliament; but gained a prize for a piece of manufacture. At Preston he was beat in an election, by means of an opposing bribery. He was again indicted for a seditious libel; but the jury could not agree. The Reform Bill of 1832 placed our author as member for Oldham in parliament, and he took his seat accordingly, which he occupied till his death, in June, 1835. At that time he lived at Normandy Farm, in Surrey; so called from having been the night's resting place of the Duke of Normandy, after the victory of Hastings.

Cobbett wrote "The woodlands, or a treatise on planting, describing the trees, grounds, and management;" London, 1825, 8vo. "Cottage economy, containing information relative to the brewing of beer, making of bread, keeping of cows, pigs, bees, ewes, goats, poultry, and rabbits, and other matters of a labourer's family;" London, 8vo., 1822. "Treatise on Cobbett's corn, containing instructions for propagating and cultivating the plant, and for harvesting and preserving the crop; and also an account of the several uses to which the produce is applied, with minute directions relative to each mode of application;" London, 1828,

SVO. "Rural rides in many counties of England, with economical and political observations relative to matters applicable to and illustrated by the state of these counties respectively."

"The woodlands" forms an octavo book of 601 paragraphs, which are enumerated in place of pages. The contents are descriptive of the author's boyish entertainments among the woods and copses of Surrey, and advance little beyond that practice. The trenching of all lands to be planted is recommended to be done two feet deep; and the pruning or mangling of trees is absolutely indispensable. Experience has now done away with both these provisions. The book contains much useful writing. "The cottage economy" fills 207 pages, and is perhaps the neatest and most usefully descriptive thing that ever was written on the subject. Here are combined all the author's very graphic simplicity of statement, with his personal knowledge of the subject that is treated. This opinion is universal. On the subject of pigs among the labourers, he says that a fitch or two of bacon is a great source of harmony between a married couple, and do more to prevent poaching than all the penal statutes that ever were enacted. The provision to keep tame animals is an effectual hindrance to go in search of wild ones. These truths are home thrusts of irresistible force; and the whole work is of similar sayings. "The treatise on Cobbett's corn" is a neat octavo volume of eleven chapters, in 203 paragraphs of description. The author mistook the possibility of accommodating the coarse corn of America to the climate and tastes of the British people. "The rural rides" are a model of the graphic simplicity of description for which Cobbett was so distinguished. The observations are very acute, and singularly correct. Cobbett published in 1822 an edition of Tull's Horse-hoeing Husbandry, prefixing to it a preface and introduction, and subjoining some notes and addenda. There are introduced several allusions to modern proceedings that seem analogous to Tull's ideas, and to the author's own sentiments. It added nothing to the original merit of Tull.

This author did not in any way advance the practice of agriculture either by precept or example, but he adorned the parts that have been mentioned by his homely knowledge of the art, and most agreeable delineation. He did not grasp the art as a comprehensive whole, nor did he aspire to the higher branches, among which to indulge a lofty seat of view and ideal elevation. His "Cottage economy" was the result of early impressions, and does honour to his head and his heart.

Our purpose scarcely comprehends the political notice of Cobbett, whose name is generally well

known. His change of political creed had arisen from some affront or personal indignity, and showed the person to be the changeling of men in preference to measures or principles. This charge cannot be refuted. The philosophy of Cobbett was shallow, puny, and evanescent, and he seems to have been totally destitute of any of those grand principles which do not require to be ever changed, and which progress steadily, regardless of men or accidents, and like the sun vanquish all opposition, as that luminary rises in the east, and without noise dispels the mist and fogs of every clouded atmosphere. These principles need no eloquence to be enforced, nor any personal opinion, but remain as rocks in the sea that are never moved, or lifted up and down by tides. His mind had no philosophic grandeur, and but a small share of moral dignity. The hostility of Cobbett was a fiendish poison of the most virulent rancour, and wanted the wholesome discipline of the sense of what is virtuous and becoming. His flimsy weapons of attack on Sir Robert Peel glanced aside without a scratch of impression, and were shattered into atoms against the adamant mail within which that profound statesman had encased himself; the words of abuse and the public accusations were unable to move the colossal weight of practical good. As a mere writer, Cobbett stands high, and possessed a style of words of the purest English idiom. His private character was amiable and affectionate, and both publicly and privately a benevolent philanthropy was ever present in all possible cases. A singular character in a member of parliament from a smock-frocked lad, with hob-nailed shoes, and done within the average compass of human life. No common qualities, or the usual industry and application of mankind, could accomplish such a result; there must have been a large natural gift on which to use the means of circumstances, and which dispensed with the usual and indispensable learning of the college and the bar. If Cobbett did not equal the products of these advantages, he excelled most who have practised without them.

USE OF POND MUD.—Some three or four years ago, as an experiment, we drew out of the bottom of a pond filled during the season with back-water from the canal, but dry in the spring, about fifty loads of mud, which was applied immediately to the land. For the first and second years it seemed to prove a decided injury, but after being turned up with the plough and subjected to the action of frost for one winter, the beneficial effects began to manifest themselves, and the best of our barn-yard manures have not produced so heavy a growth of grain, and the effect promises to be permanent. Probably a better way would have been to have piled it up for one year, or composted with other manure, or with lime.—R. MERCHANT.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

WEEKLY COUNCIL, *March 29.*—Colonel CHALLONER, Trustee, in the Chair. The names of 61 candidates for election at the next meeting were announced.

MORTALITY AMONG LAMBS. — Professor Simonds informed the Council that he had inspected Mr. Cresswell's lambs in Leicestershire, and had made *post mortem* examinations at the Royal Veterinary College, of some that had died there. He had been favoured by Mr. Cresswell with others, which, with an ewe, were undergoing inspection in reference to the gradual development of the disease with which it was supposed they were affected. He had made a minute examination into all the local circumstances under which this malignant affection had occurred among Mr. Cresswell's flock: and when he had completed his investigations into its nature, and the best remedies for its treatment, he would lay before the Council a complete report, embracing the whole of the details connected with the subject, which presented many novel features in reference to the disorders affecting sheep.—A letter in reference to the case of Mr. Cresswell's lambs was read from Mr. Eames, of Ashby-de-la-Zouch; and remarks on the different points connected with Prof. Simonds's inspection were made by Colonel Challoner, Mr. Raymond Barker, Mr. Fisher Hobbs, Col. Hall, M.P., and Sir John Shelley, Bart., M.P.

MAD DOGS.—Prof. Simonds then communicated the following statement relative to the fearful increase of mad dogs, and their ravages in and about London:—

1. At the present time madness prevails among dogs to an unusual extent, particularly in the neighbourhood of London. Within the last few weeks several sheep and horses have been bitten by dogs, and have since died in a rabid state. These occurrences have taken place in the northern districts of the metropolis; and within the last few days two dogs, which gave only very slight evidences of deranged health, were brought to the Royal Veterinary College, and have since died in a perfectly rabid condition; one of these dogs having previously bitten no less, it is feared, than forty other dogs.

2. The sheep alluded to belonged to three farmers at Hendon, and were bitten in the early part of last February; they died at the beginning of March, exhibiting all the symptoms of this horrible malady.

3. A horse also bitten at the same time died a fortnight since in Kentish town, perfectly mad.

4. This disease prevailed last year in the northern part of England, and has been gradually proceeding southwards. A farmer in Lincolnshire had last year upwards of sixty ewes bitten in one night by a single dog, all of which animals, with two or three exceptions, died within a few weeks afterwards. An unusual number of dogs are at the present time loosely wandering about the streets, apparently without owners.

Prof. Simonds then read a letter addressed to him on this subject by Mr. William Simpson, one of the Members of the Council; and Col. Challoner, Mr. Majendie, Sir John Shelley, Mr. Bullen, Prof. Way, Mr. Foley,

and Mr. Wrench, favoured the meeting with their remarks; when, on the motion of Mr. Raymond Barker, seconded by Sir John Johnstone, Bart., M.P., the Council agreed to the following preamble and resolution:

“Professor Simonds, the Veterinary-Inspector of the Society, having made a report to the Council, relative to the alarming increase of mad dogs in the immediate neighbourhood of the metropolis, and of the fact that several sheep and horses have been bitten and destroyed,—Resolved, that the Secretary of the Society be instructed to communicate these facts to the Right Hon. Viscount Palmerston, G.C.B., her Majesty's Principal Secretary of State for the Home Department, with the view of calling his lordship's attention to their consideration.”

OIL-CAKE.—Mr. Fisher Hobbs called attention to the following communication, which had that day been placed in his hands:—

“We observe from the public press that your Council have been discussing the subject of oilcakes, and, as seed crushers, we are much pleased that the adulteration of Linseed cakes has been taken up by your Society; and we trust that the attention of so influential a body amongst agriculturists being directed to the question may pave the way for at least an abatement, if not to an entire suppression of the evil, which is not only a fraud upon the buyers, but an injury to manufacturers of genuine cakes. We would, however, respectfully state that, from our own knowledge, much of the evil complained of arises from the prejudice of farmers, by their objection to cakes being hard, and which has induced many crushers to resort to adulteration, not only with nut cakes, but also with bran and other mixtures to produce a soft cake; and we have known many instances in which a preference has been given to adulterated cakes over those made from genuine seed. We beg further to communicate that what is called a soft cake, to be genuine, cannot be produced from the finest description of seed; and one step towards the object sought by your Council would be by agriculturists laying aside their objections to a cake if rather hard. There being no process that should be kept secret in the manufacture of cakes, we would suggest that crushers at all times allow to buyers free access to any part of their mills; by which means they may satisfy themselves that the cakes they are buying are free from all mixture of bran, nut cake, or other ingredient. Our own mill is open in every part, and at all hours, for the inspection of buyers—let this be generally acted upon, and the adulteration of Linseed cakes will cease. We sincerely trust that the evil so justly complained of may be removed.”

Mr. Hobbs thought this communication most valuable. He had known soft oil-cake contain in many cases no less than 15 per cent. of water, and he thought the purchase of such an article was buying water at too dear a rate.—Col. Challoner, Prof. Way, Mr. Paine, Mr. Caird, Mr. Gower, and Prof. Simonds, offered observations on, 1, The degree to which chemical analysis was capable of furnishing more than the relative proportion of albuminous matter and oil in different oil-cakes, when employed with a view to detecting adulteration; 2, On the value of the microscope, by the discriminative means of which it was probable that all agents used

for adulterating cake might be detected; 3, On the conditions under which the feeding and keeping qualities of oil-cake were affected by its hard or soft state; and 4, On the confidence to be placed in cake purchased of established dealers of known reputation.

MANURE HEAPS.—Mr. Robert Austin, of 65, George-street, Manchester, informed the Council that upwards of a ton of horse-dung was produced in his stables daily, and the usual offensive odour and evaporation from it entirely prevented by sprinkling over the dung-heap, by means of an ordinary watering-can, a solution of a pound of common green copperas in a gallon of water. The value of this chemical agent in fixing ammonia and strengthening manure had long been known (Journal I., 468, 470, 475), but Mr. Austin's practical application might be considered simple, effective, and easily adopted in similar cases.

POTATO DISEASE.—The Hon. Grantley Berkeley presented a copy of his work "On the Origin, Nature, and Cure of the Potato Disease" (dedicated to the society), with a statement of further details connected with his system of cultivation. Dr. Malfatti transmitted from Vienna a second series of his experiments on the cure of the potato disease. M. Lainé, of Paris, forwarded copies of his results on the same subject.

The Council ordered their usual acknowledgments for the communications then made to them, and adjourned to the 5th of April.

A MONTHLY COUNCIL was held at the Society's House, in Hanover Square, on Wednesday, the 5th of April. The following Members of Council and Governors of the Society were present:—Colonel CHALLONER, Trustee, in the Chair; Sir John V. Shelley, Bart., M.P., Sir John V. B. Johnstone, Bart., M.P., Sir Robert Price, Bart., M.P., Mr. Raymond Barker, Mr. Barnett, Mr. Hodgson Barrow, Mr. Barthropp, Mr. Bramston, M.P., Mr. Brandreth, Mr. Barker, Mr. Cavendish, Professor Daubeny, Mr. Garrett, Mr. Brandreth Gibbs, Mr. Grantham, Mr. Fisher Hobbs, Mr. Hudson (Castleacre), Mr. Jonas, Mr. Kinder, Mr. Lawes, Mr. Lawrence, Mr. Neill Malcolm, Mr. Mainwaring Paine, Mr. Jonathan Rigg, Professor Simonds, Mr. Crompton Stansfield, Mr. Thompson (Kibby Hall), Mr. Turner (Barton), Mr. Jonas Webb, Mr. Wingate, and Mr. Woodward.

FINANCES.—Mr. Raymond Barker, Chairman of the Finance Committee, presented the monthly Report on the accounts of the Society, from which it appeared that the current cash-balance then in the hands of the bankers was £1,364.

CHEMICAL GRANTS.—Sir John V. B. Johnstone, Bart., M.P., laid before the Council the Report of the Chemical Committee, which was read and adopted.

LINCOLN MEETING.—Colonel Challoner presented the Report of the General Lincoln Committee, which was also read and adopted. It had reference to the arrangements connected with the dinner of the Society at the ensuing country meeting, to be held at Lincoln in July next; and to the plan of the cattle, implement, and trial yards, drawn out by Mr. Brandreth Gibbs,

the honorary director of the Show, and adopted by the Committee.

MEMBER OF COUNCIL.—On the motion of Colonel Challoner, seconded by Mr. Brandreth, Charles Towneley, Esq., of Towneley Park, in the county of Lancaster, was elected one of the general members of Council, to supply the vacancy created by the transfer of Sir John Villiers Shelley, Bart., M.P., to the class of Trustees.

COUNTRY MEETING OF 1855.—A memorial was received from the authorities of Carlisle, inviting the Council to select that city as the place of the Society's country meeting of next year. The Council requested Mr. Raymond Barker, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Brandreth, and Mr. Cavendish to form an Inspection Committee, for the purpose of visiting the proposed localities, and of reporting to the Council, at their next monthly meeting, the respective capabilities of the several sites and edifices required for carrying out the objects of the meeting.

ARRANGEMENTS FOR COUNTRY MEETINGS.—On the motion of Mr. Raymond Barker, seconded by Mr. Brandreth, it was resolved—"That the Council reserves to itself the right to adopt at all country meetings such arrangements as may seem most conducive to the general objects of the Society, without binding itself to adopt or follow the arrangements of previous years."

LECTURES.—On the motion of Mr. Thompson, seconded by Sir John Shelley, the following arrangements were made for the delivery of lectures at weekly meetings of the Council, held at 12 o'clock at noon, and open to all members of the Society:—

May 10.—Prof. WAY: On the progress made in the manufacture of artificial manures.

May 17, } Prof. SIMONDS: On the particular indications of
and } the ages of animals, furnished by the structure
May 24. } of the teeth and the general develop-
ments of growth, in cattle, sheep, and pigs.

May 31.—Prof. WAY: On the nature and use of peat charcoal, and other deodorising substances, in reference to agriculture.

June 21.—Prof. WAY: On the absorbent nature of soils.

MAD DOGS.—Sir John Shelley took that opportunity of stating, that on enquiry at the Home Office, he had found that, in consequence of the representation made by the Council at their last meeting to Lord Palmerston, on the increase of mad dogs in the neighbourhood of the metropolis, attacking not only persons in the streets, but committing ravages on the live-stock of farmers, his lordship had given orders to the police to take possession of all dogs found at large and unowned. Under this salutary regulation, Sir John Shelley had reason to believe that several suspicious animals roaming abroad in the streets had already been removed, and being unclaimed had been shot.

PRIZE ESSAYS.—Mr. Pusey, as Chairman of the Journal Committee, transmitted to the Council the following awards, made by the judges of Essays and Reports:—

I. To LEWIS HENRY RUEGG, of Sherborne; the Prize of £50 for the best Report on the Farming of Dorsetshire.

II. To CLARE SEWELL READ, of Wallington; the Prize of £50 for the best Report on the Farming of Oxfordshire.

III. To JOHN ALCEENON CLARKE, of Long Sutton; the

Prize of £50 for the best account of Trunk or Arterial Drainage.

IV. To EDWARD E. AGATE, of Horsham; the Prize of £10 for the best essay on the Autumn Cleaning of Stubbles.—The essay in this class, bearing the motto "Practice with Science," was commended by the judges.

Adjourned over Passion and Easter weeks to the 26th of April.

NEW MEMBERS.

The following new Members were elected:—

Arckell, Thomas, Badlington, Cheltenham
 Becher, Rev. John Drake, Southwell, Notts
 Belcher, Charles, Kidmore End, Reading
 Blaine, Delabere R., Tanfield Court, Temple
 Browne, Edward W., Langton, Wragby, Lincolnshire
 Butt, Henry, Southgate Street, Gloucester
 Carhus, Thomas, Barwell Court, Kingston-on-Thames
 Chaplin, Charles, Blankney, Lincoln
 Clarence, John, Bishopsgate Street, London
 Coking, George, Crowle, Lincolnshire
 Crafts, Rev. C. D., Caythorpe Rectory, Grantham
 Day, W. Chambers, Birmingham
 De Lisle and Dudley, Lord, Penshurst Park, Kent
 Dowling, Edwyn, Vineyards, Bath
 Edwards, Dr. Benard, Conway, Carnarvonshire
 Epton, William M., Langton, Wragby, Lincolnshire
 Forsyth, James, Dinach, Argyshire
 Fowler, William, Birches Green, Erdington, Birmingham
 Gale, Charles J., Kilnocks, Botley, Hampshire
 Hancock, Thomas, Tytles Farm, Crawley Common, Sussex
 Harding, Edmund, Bonn's Park, Tunbridge Wells
 Harper, Latimer, Barton Hall, Kettering, Northamptonshire
 Harper, S. B. A., Testbourne, Totton, Southampton
 Henderson, Joseph, Alfreton, Derbyshire
 Hitchins, Frederick, Dover's Green, Reigate, Surrey
 Hornblow, William, Ripple, Tewkesbury, Gloucestershire
 Hubbark, Joseph, Liverpool
 Hubie, Robert, Barby, Selby, Yorkshire
 Pythe, Lewis, Thorpe Hall, Louth, Lincolnshire
 Jephson, Samuel, Alfreton, Derbyshire
 Kennedy, Charles Storr, Fairview, Ulverstone, Lancashire
 King, W. C., Darfield Hall, Bracknell, Berks
 Kingscote, R. N. Fitzhardinge, M.P., Kingscote, Glouc.
 Knight, John, Forthampton, Tewkesbury
 Lord, John, Hill End Farm, Chaotley, Tewkesbury
 Lucas, J., St. Mary Street, Lincoln
 Mason, Richard, Kidlington, Louth, Lincolnshire
 Maude, Captain, the Hon. Cornwallis, 2nd Life Guards,
 Regent's Park
 Millward, John, Birmingham
 Monck, Viscount, M.P., Charleville, Co. Wicklow, Ireland
 Moore, Joseph, Lincoln
 Other, Charles, Elm House, Leyburn, Yorkshire
 Overman, John, Burnham Sutton, Norfolk
 Owsley, W. P. Mason, Glaston, Uppingham, Rutlandshire
 Paine, William Duckley, Canonbury Park, North Islington
 Pannell, C. L., Meroo, Guildford, Surrey
 Phillips, John Henry, Elmsley, York
 Pickford, William, 35, Leadenhall Street, London
 Pritt, John, Lancaster
 Rayner, William, Owston, Isle of Axholme, Bawtry
 Richardson, John, Northland's House, Winterton, Brigg
 Rowland, John, I-lip, Oxford

Skipworth, William, South Kelsey, Dugg, Lincolnshire
 Sonley, William, Kirby-moor-side, Yorkshire
 Talbot, Richard, Lincoln
 Turner, Philip, The Leen, Pembridge, Herefordshire
 Unsworth, John, The Thoro, Penrith, Cumberland
 Walker, Sir E. S., Berry Hill, Mansfield, Notts
 Ware, James Thomas, Tilford House, 1,araham, Surrey
 Whibley, George, Panthurst Weald, Sevenoaks, Kent
 Wilson, Richard, Stonor, Henley-on-Thames.

THE VINE AND POTATO DISEASES.—As the tree grows particle by particle, so science is perfected fact by fact. Probably there does not exist any of the arts and manufactures in which scientific research, and correct practice founded thereon, has been so tardily developed as in agriculture. We are led to make these remarks from the circumstance that disease in the vine has been very destructive in most of the vine-growing countries of Europe, and it appears to have been induced by over stimulation of the plant. This is a more serious affair than would appear at first sight, for in Burgundy the vine is not considered to have arrived at maturity under a century, and some of the richest wines of that country are said to be the produce of vines that have existed for 200 years and upwards. An antidote for the disease of the vine is said to have been discovered in iodine, the produce of marine plants. It has been suggested by a correspondent "that, in all probability, a similar result will be produced on the too well known disease of the potato by mixing iodine, in small quantities, with ordinary manure, in such localities as are too far distant from the sea to apply seaweed." It must be obvious that a substance so costly as iodine in its manufactured condition would be too expensive for general use. Happily, at this juncture, a process has been introduced by Mr. Longmaid, as we had occasion recently to notice, for decomposing and condensing marine plants into a portable compass, and at the same time rendering their properties more powerful. By this means the seaweed, with its iodine, can be transported to any reasonable distance, at a comparatively slight cost. Should this suggestion prove correct, we doubt not the agriculturist will readily appreciate its value.—*Journal of Commerce.*

CURING GRASS FOR HAY BY STEAM.—This is an age of bold innovations of old customs. We have one to propose which is worthy of the consideration of our State Agricultural Society, and now is the time to think about it, that premiums may be offered, or the matter at least discussed at the January meeting of the members and executive committee. It is to solve the question of curing grass for hay; that is, discharging the water from it by steam instead of the slow, imperfect process of drying it in the sun, often interrupted by rains, and the product injured or spoiled. Now, if saturating it with steam will have the effect, as we believe it will, to cure it, so that an hour of sun will dry it, or so that it may be preserved with salt, it opens a new era in the use of steam for agricultural purposes. The process need not be a very expensive or laborious one. Let the grass be heaped up as fast as cut, and covered with India-rubber cloth. Then a pipe from a steam-boiler, mounted upon a waggon, may be inserted under the centre of the pile, and steam applied to a degree of heat strong enough to almost cure the whole heap; at any rate to prepare it for a very rapid sun drying. We believe, from some experiments which we have seen in drying other vegetable substances, that green clover may be prepared in three hours for safely stowing away in the barn. By using metal caps, instead of cloth, the process of steaming may be continued to a degree sufficient to expel all the moisture. Whether it can be economically used on the farm is the point to be settled. Steam has already been applied to carry manure to the field, ploughing the ground, and thrashing the crop. No doubt it will be soon applied to sowing the seed and reaping, as well as mowing, and it only remains to cure the green grass as fast as cut, by the same powerful agent.—*New York Tribune.*

THE STATISTICS OF AGRICULTURE.

It would be hard to say to whom we owe the least thanks for any progress the question of Agricultural Statistics may be really making. We began, of course, naturally enough, with the agriculturist himself; he, by his own avowal, was the great difficulty in the way of arriving at such returns, for he would not furnish them. So far, however, he has scarcely been as good as his word. It would seem, rather, that one or two of the most noisy took upon themselves to speak for the whole, and to invite a censure by no means merited. What these gentlemen declared so loudly should *not* be done, has been done—at least with an exception so trifling as to be hardly worth further allusion. In Norfolk, we are officially assured, the enquiries made only failed to elicit information to the extent of two and a-half per cent.; and in Hampshire, that stronghold of opposition, to three and a-half. In Scotland the experiment was yet more satisfactory. And hence this wholesale charge against the British farmer comes a little prematurely. It arises from the old cause, too: he was misrepresented by those who so complacently undertook the statement of his case.

The Government, then, so far as the class most directly interested has been tested, announce this attempt to collect the statistics of agriculture as "a very satisfactory result." We are by no means inclined to dispute this, although we must repeat that very small thanks are, after all, due to those who are thus enabled to congratulate themselves. Seldom, indeed, has any scheme, the establishment of which has been so desirable, ever been introduced with so little corresponding energy. "If you do want these statistics," said the Government, addressing the most indefinite anybody in the most indifferent of tones, "we don't mind giving you two or three hundred pounds; but don't bother us about them. Go to the farmers and the guardians, and soon. No doubt these returns will be very useful to us, and so tell the people they *may* make them." It is the languishing lady, who, when her gallant offered to risk his life in her service, calmly assented, and declared that he had her permission to do so.

We trace the same kind of feeling still more or less apparent in the consideration our rulers give to this question. The "very satisfactory result" was declared by a gentleman connected with the Government at the adjourned meeting of the Society of Arts, on Wednesday, April 5. He had been pre-

ceded the week previous by another, who spoke or wrote officially, and whose advice was directed to the continuance, and general attainment of these satisfactory results. The plan was simple enough. The information was to be collected by means of paid inspectors, and these inspectors were to be paid by an acreage tax on the land they inspected. That is to say, the establishment of Agricultural Statistics is highly desirable; it is regarded in fact as something of a national benefit, and, *ergo*, the farmers are to supply the information, and they are to be taxed for doing so! A most politic and palatable project, which is just sufficiently absurd to require no further comment.

It is not our purpose to give even in part the very lengthy and not generally interesting discussion which followed the reading of Mr. Levi's paper at these two consecutive meetings of the Society of Arts. We should only be reprinting a great deal of matter with which our readers are already acquainted, and some, we must honestly say, that would be scarcely worthy their attention. Despite the one or two extraordinary objections offered to it, we will at once admit Mr. Levi's position, "that it is important and expedient to obtain agricultural statistics," and proceed to consider how their collection may be made. Of the three different methods submitted—one already adverted to from Mr. Jadis, of the Board of Trade; a second by Mr. Levi himself; and a third by Mr. Caird—we are inclined to attach most importance to the last-named. It will be better, as far as possible, to let this speak for itself:

1. The main object is to obtain trustworthy returns, and these with the least necessary expense.
2. Trustworthy returns can be obtained only through trustworthy officers, responsible for the correct performance of their duty, and working under a system which affords a ready test of accuracy.
3. Economy will be promoted by employing a small number of competent and responsible men, rather than a very numerous body of local officials, each of whom must receive a fee, while they would be comparatively irresponsible, and, from their numbers, subject to no satisfactory test of accuracy.
4. As the returns, to be useful, must be made within a very short time after harvest, and before much of the corn can be thrashed, they must, necessarily, be of the nature of an estimate, in so far as the yield per acre is concerned.
5. It is desirable, for many reasons, that the collection of the returns be made in a manner as little inquisitorial or offensive as possible; if either, they will be apt to fail in their main object, *correctness*. The employment of confidential officers, bound to secrecy, will be a guarantee against the use of the returns for any but public purposes.
6. The first point to be ascertained is *the acreage under each different crop*; and this, as will be shown, is by far the most

important part of the inquiry. This will be, not an *estimate*, but a record of *facts*. It is requisite, therefore, that it be conducted with care and deliberation; and, as it may be begun as soon as the seed is sown, the three months of May, June, and July, may be occupied in this part of the inquiry. 7. There can be no reasonable objection on the part of any occupier to an inquiry as to the manner in which the surface of his farm is cropped. That is quite a different question from demanding to know the total produce of his crops. Nor would there be the same objection, on the part of the farmers, to answer such questions when put by a responsible and confidential officer, as by what might be thought a prying and irresponsible neighbour. 8. The varying measures and weights in use throughout the country are a further argument in favour of competently qualified officers, who could personally ascertain the local measures, and convert them into the recognised standard; and this might be made the direct means of introducing, and gradually establishing, a uniform standard of weights and measures. 9. The acreage under each different crop having been ascertained, the occupier would be required to say, not what was the actual produce of a particular field, but the actual produce per acre of each crop, on his farm, in ordinary years. 10. *Before harvest* these important facts would thus have been ascertained, viz.:—1st. The extent under each kind of crop. 2nd. The average produce per acre of ordinary years. There would remain to be ascertained *after harvest*, only—3rd. How much the yield of that crop was above or below the average. 11. The effects of good or bad cultivation on each farm having been ascertained by the average produce, it follows that the effects produced by good or bad weather would be all that would remain to be learned after harvest—and, as the effects of weather over a parish would be pretty uniform, a single answer, from a competent judge of light and heavy soils in each parish, would fix this point."

There is a great deal of sound argument as the basis of this plan; while, however, much more may be desired, we concur with Mr. Caird that the acreage under each different crop will be the important feature of the inquiry. Beyond this we can ensure nothing; at most, but clever guess-work; and we are by no means sure but that it would be better to rest content at this stage of the inquiry. Professor John Wilson, who, like ourselves, was unable to attend the adjourned discussion, has written a letter to the *Journal of the Society*, in which he thus refers to this part of Mr. Caird's plan:—

"As regards his (Mr. Caird's) proposition, that a knowledge of the breadth sown with any particular crop will give the earliest and most reliable indications of what produce may be expected, I hope I may without any impropriety allude to some inquiries of my own, which were made last year, and which strongly confirm his proposition. In an industrial tour to the north, in the early part of the spring, the condition of the crops was one of the principal objects of my inquiry, and the results I obtained appeared to me so important that I felt it my duty immediately on my return to communicate them to the President of the Board of Trade. On inquiry into the breadth sown in wheat in the different corn-producing districts through which I passed, I was led to the conclusion that the area sown was, on an average, from one-third to two-fifths less than that of ordinary years; while the wet and ungenial weather of the previous season had had such a debilitating

effect upon that which was sown as would probably reduce its yield from 5 to 10 per cent. Thus, it appeared to me that we should have to meet a deficiency in our harvest of about 40 per cent. upon our ordinary returns. This communication was made on the 20th March—how far my estimate proved correct we unhappily know too well."

The result so far, the Government assures us, is satisfactory. It only remains now with those in power to lead the experiment on to as successful an establishment. In effecting this, we would have them remember that if it is worth doing at all, it is worth doing well. Mr. Caird, his ardour a little damped no doubt by the extreme economy already displayed in this matter, would have his system carried out under the direction and with the machinery of the Tithe and Inclosure Commission Office. To this Professor Wilson objects, and for reasons that we can most cheerfully adopt:—

"If the inquiry is of that vital importance which I believe it to be, it appears to me that it should be conducted by a special department, with machinery of the best character, and specially adapted to its particular requirements, rather than be tacked on to any other branch of the public service, especially one which carries with it a title so little grateful to a farmer's ear as that of the *Tithe and Inclosure Commission*. The first consideration in such an inquiry is, that it be *efficiently* and accurately carried out; the question of expenditure is a secondary consideration."

Here the question clearly rests with the Government—*Is the inquiry of vital importance?* And, if it is, are they prepared to carry it out with machinery of the best character, and on which they have a right to depend? So far, their own experience assures them they have nothing to fear from the farmer. Nor will they, unless it be owing to such productions as that Mr. Jadis has been hardy enough to publish, or by the continuance of a petty kind of policy, as unworthy of, as unequal to the great object they seek to attain.

ON THE IMPORTANCE OF A CORRECT SYSTEM OF AGRICULTURAL STATISTICS.

BY LEONE LEVI, F.S.S.

Of all questions, that of subsistence is the most important which could engage the attention of the legislator, the senator, the statist, or the civilian. It is the touchstone which draws into it all the elements of public and social welfare. It is the foundation of national prosperity, and the essential of individual happiness. When one of our mighty floating palaces weighs her anchor for a long passage across the ocean, the first of her preparatory duties is the purchase of provisions—to see that a sufficiency of stores is provided for her crew and passengers. And when on the setting-in of winter we enter on our yearly pilgrimage, is it not the duty of a nation, as of individuals, to make an estimate of the amount of food we are likely to have—whether we shall have full rations, or have to make up with half a one?

And yet we are blindly groping our way, eating perhaps in superabundance for a few short months, and when well entered into the gulf of our yearly existence, we must put into a port of distress to purchase food, at whatever prices it can be got, and to compete with the famished crew of many nations, in exhausting the surplus of a scantily provisioned stock of grain.

What are agricultural statistics but a computation of the number of loaves we shall obtain from our own fields for one agricultural year, and how many pounds of meat we shall get from our cattle? These are surely practical questions, which cannot be misunderstood; and yet whilst their plainness defies speculation, mountains of difficulties arise, and a phantom disturbs our vision, so that we are driven back from our inquiry without further consideration. What is our field of operation? The arable and garden land of the United Kingdom is about twenty millions of acres; and the meadows, pastures, and marshes contain twenty-seven millions—a surface considerably smaller than that of many other countries. The number of farmers in Great Britain actually does not exceed 300,000, so that in the extended practice of large holdings any calculation becomes circumscribed and easy. We may conceive that in such an immense country as Russia, with half the land comparatively raw, and unapproachable by the ice, or in such a country as the United States, now only subjected to human strength by the iron axe of the sturdy settler, it will, indeed, prove difficult to scan it all over, to compute the number of acres sown with different crops, and the number of quarters of grain which they yield. No such difficulty ought to be experienced within the British Islands, every portion of which has been long explored, inhabited, and tested as to its capabilities, to the best of human powers and ingenuity.

But experience is the mother of wisdom. What does it teach? Have attempts carefully made actually failed? On the contrary, we find that individual merchants, such as Mr. Sanders and Mr. Hodgson, of Liverpool, have obtained pretty accurate accounts by sending individuals into different parts of the country, whilst the grain is yet in the ear, to cut out a square yard and see what it would produce in the different kinds of land—clay lands, sandy lands, &c. The Highland and Agricultural Society of Scotland have recently transmitted abstracts of returns of the Agricultural Statistics of the Counties of Roxburgh, Haddington, and Sutherland, returns which called forth the approbation of the Board of Trade. There we find the number of acres under different kinds of crop; the amount of stock; and also the amount of steam, water, and horse power employed agriculturally in East Lothian, and an estimate of the produce of the crops. Similar statistics have also been obtained for the counties of Norfolk and Hampshire. But the most complete answer which may be given to those who apprehend insurmountable difficulties, is to be found in the satisfactory results of the statistics of the produce of Ireland, collected by the efficient aid of the constabulary and metropolitan police, on printed forms, and in pursuance of instructions supplied to them. It is not asserted they are perfect: it is physic-

ally and morally impossible that such statistics can ever be perfect; but as a whole, for all practical purposes, they may be considered a most successful performance. These furnish the number of holdings, the extent of land under crop, and an estimate of the quantity of produce by counties, and by poor-law unions; the rate of produce, the classification of crops, the breadth of flax cultivated in each county, and the numbers of stock of all descriptions.

To arrive at a correct appreciation of the subject, we must first be convinced of its importance, and of its expediency, then distinctly apprehend what is required, and, lastly, by what means it may be attained. On the importance and expediency of collecting statistics of agricultural produce, it might seem scarcely necessary to enlarge; but the claims of statistical science in this direction have not hitherto been universally recognized. It is a melancholy truth, that as yet few believe in statistics. The philosophy of inductive science is with large numbers a mysterious problem. Everybody admits that if in repeated instances, over a long space of time, a certain event has happened at certain periods there is good ground for believing that the same will continue to happen; but a preconceived scepticism in numbers prevents them applying common reason to great but everyday occurrences. They have not the power of magnifying figures, and of preserving the same faith in them. Besides other considerations foreign to the purpose, as well as self-interest, political tendencies, or dread of revelations, enter the mind, and are sufficient to make them decided enemies to statistical inquiries. The masses must, therefore, be taught the meaning of statistics, their object and province. Statistics is the science of observation. It takes actual facts, and studies them in their nature and effects. It is founded on experience rather than on theory. A chemical discovery is made. It is applied to the cultivation of the soil. The statistics of produce of that soil before and after the application of such chemical discovery is the surest test of its worth. Within the domain of statistics is whatever is important to the interest of a state, whether it be institutions, physical forces, education, science, crime, or religion. Its province is to elaborate truths which lie remote from the surface of daily life, and to reduce into statistical analysis the wants, the resources, and the experiences of society at large. In the words of the fifteenth annual report of the Statistical Society of London:—"Man in society is the subject of our study; to detect the influences which bear upon his welfare our ultimate aim; inductive reasoning from phenomena observable, and observed with mathematical precision, our method; and to make use of all evidence of this character which may be turned up in the early working of society, as well as to collect new data, our necessity." As to the statistics of agriculture, we have abundant evidence that a sufficiency of supplies of food for the growing population is most important to the moral, political, and material welfare of a state. When misery prevails, crime abounds. When corn is dear, a cry for reform finds a ready ear; and when our loaves cost 10d. instead of 6d., money is dear, prices of manufactures are

low, and labour is scarce. It is to enable us to meet these contingencies betimes that agricultural statistics are wanted. If we possess an early estimate of what we are likely to require from foreign countries, we shall be able to send ships to the Baltic long before the Russian ports are frozen, and shall be early in the markets to provide for our wants. We must remember that, as the harvest on the continent is generally two months earlier than in this country, they have the first chance of obtaining their supplies at cheaper rates than we can when our wants are fully manifested.

It is not then an abstract question, but one of great practical bearing, to possess proper statistics of agricultural produce. Its pounds, shillings, and pence value is not less evident. The deputation from the City lately presented a petition on the subject to Lord Aberdeen, and it was by them stated that the quantity of corn annually sold in the United Kingdom is not less than 40 million quarters, and the simple oscillation of 1s. per quarter would make a difference of about two millions sterling. The fluctuations in prices in the last few years is as follows:—

HIGHEST AND LOWEST AVERAGE PRICES OF GRAIN FROM THE YEAR 1846 TO 1853.

Years.	Highest.		Lowest.		Difference.	PerCent.
	s.	d.	s.	d.		
1846.....	62	3	45	1	17	27
1847.....	102	5	49	6	52	11
1848.....	56	10	46	10	10	0
1849.....	49	1	38	9	10	4
1850.....	44	1	36	11	7	2
1851.....	43	6	36	9	6	9
1852.....	45	11	37	2	8	9
1853.....	73	0	43	3	29	9

The shipowners also find in this uncertainty the utmost difficulty in providing ships, the difference in the tonnage alone being estimated at one million tons.

Having so far established the position that it is important and expedient to obtain agricultural statistics, we shall proceed to the second inquiry, and the most important one, viz., What kind of statistics, and at what intervals of time, and at what months of the year are they required? The important object to be kept in mind is, that of all statistics agricultural statistics are intended to meet a substantial want. We cannot adapt our wants to such statistics, but we must adapt such statistics, and the machinery for obtaining them, to what is felt necessary. To have the statistics of the quantity of food at our disposal for a given time, when that quantity is all eaten up, is altogether absurd. And yet such are the agricultural statistics of Ireland, which appear a year and a quarter after each harvest. The same may be said of the returns received from the Highland Society, and of those not yet published for the counties of Norfolk and Hampshire. What is wanted is, first, how many acres of land are sown with each kind of crop; secondly, the probable yield, and this sufficiently in time to govern the markets, to check alarm, or to give a timely warning of impending wants. We know our wants, if we do not know our supplies. We know that a population of 28 millions will require 28 millions of quarters annually of wheat and flour, besides what is wanted for cattle, horses,

malting and other purposes. Already our population is largely dependent on foreign wheat. Estimating the yearly consumption of each individual at eight bushels, and taking the average yearly importation of wheat and wheat-flour, it seems that whilst from 1801 to 1810, the mean population of Great Britain being 11,769,725, the number of persons fed upon foreign wheat was 600,946. From 1841 to 1850, the mean population being 19,967,876, the number dependent upon foreign wheat and wheat-flour was not less than 2,818,328. The quantity of grain imported from 1847 to 1853 was as follows:—

GRAIN IMPORTED INTO THE UNITED KINGDOM FROM 1847 TO 1853.

Years.	Quarters.
1847	11,072,533
1848	7,528,183
1849	10,669,661
1850	9,019,579
1851	9,618,026
1852	7,779,145
1853	10,068,665
	<hr/>
Average	9,479,411

Formerly the quantity imported yearly, varied considerably. One year we might want one or two millions of quarters; the next, nothing. Of late, however, the importation has been uniformly large, leaving a conviction that our agricultural produce does not keep pace with the increase of our population, and with their growing resources; and we are the more interested to ascertain as early as possible what is that amount of extra supplies which will be required to meet our already large want of foreign help. Of the two subjects of inquiry—how many acres of land are sown, and the probable yield—the former is easier ascertained than the latter. In both there must necessarily be some looseness. The first would embrace the number of acres sown with wheat, barley, oats, rye, beans, peas, flax, seeds, turnips, potatoes; the number of acres in permanent grass, and the number in annual grass, &c. The second, an estimate of the probable yield of each per acre. The returns of the number of acres under crop might be collected early in spring. By extensive meteorological observations, the progress of vegetation might also be obtained at various intervals. The estimate of the produce should be obtained within one month, at the latest, after the harvest. The difficulty of obtaining the accounts at such an early period is doubtless considerable, having regard to the time requisite for printing, distributing, collecting, and classifying the returns. It has been suggested by Mr. G. Wingrove Cooke to select in every county some few parishes, which shall fairly represent all the diversities of soil, culture, and climate, that obtain throughout the county. Having settled on the representative parishes, subject of course to changing them for others, if any alteration should occur in their culture which would destroy their representative character, returns should be collected of the culture and produce of such representative parishes, which, by due calculation of the proportion of the parish to the district, would exhibit the agricultural statistics of the county.

Hille to we have spoken of annual estimates. It

may also be important to obtain decennially more complete agricultural statistics for purposes of taxation, and for the object of showing the progress of agricultural science. The Statistical Congress, lately held in Brussels, at which there were official representatives and men of science from thirty-two countries, confined its recommendation to decennial statistics. At these distant intervals the statistics might furnish complete information on the conditions, proceeds, and results of agricultural industry, comprising facts with reference—

- 1st. To the soil itself.
- 2nd. To the natural phenomena which fall under the observation of the cultivator.
- 3rd. To the implements used for cultivating the land.
- 4th. To the means employed to supply the substances with which the soil is wanting.
- 5th. To the domestic animals.
- 6th. To the special culture of each useful vegetable.
- 7th. To the laws of production, division, and consumption of agricultural produce.
- And 8th. To the relation of agriculture to society.

All these various items of information do not form an essential part of agricultural science. What concerns the soil, its nature, and its properties, belong properly to geology. Natural phenomena are within the domains of physics, zoology, or botany. The Statistical Congress did not consider it possible to reduce all these subjects in the form of statistics, and therefore simply recommended generally that the information should comprise all the conditions, proceeds, and results of the agricultural industry of the country at a given time, and all the facts which may assist towards the proper appreciation of them in all their different aspects. This is also exceedingly useful. But what is most essential, is the annual estimate; and that is the great practical object aimed at by the advocates of agricultural statistics in this country.

Now that we have cleared our path as to the objects and requisites of agricultural statistics, we shall consider the means by which they may be obtained. One might think that what is actually required is not such an enormous labour after all. The difficulties are more imaginary than real, and the inquiries are such as private individuals, stimulated by interest and enterprise, often partially carry out by themselves. We have already pointed out what Messrs. Hodgson and Sanders, of Liverpool, have done. Another illustration of a similar character may be produced. A cornfactor of London, in 1850, sent a large number of schedules containing questions on the results of the potato crop in Ireland. He received a number of replies; some from Roman Catholic clergymen, some from millers and dealers in the corn trade, and some from landholders, public functionaries, &c. The replies referred to all parts of the country, and they constituted a comparison of the potato crop of that year with the preceding one. They showed in what, and how many districts the tubers were not affected, where slightly, where partially, where much, and where at all affected—then, as to the portion of the crop that would be saved for human food. The reports gave, also, accounts of the wheat crop, describing in how many districts it was deficient; in how many a fair average, a good average, and where abundant.

These are successful experiments by individuals. The same may be said of the quarterly meteorological observations made by Mr. Glashier in forty-two places of Great Britain. There is one great advantage in individual efforts—the responsibility is less; inaccuracies are excusable; the credit attached to them is proportioned to their intrinsic value. Not so with Government accounts. They come out with all the credit and *éclat* of official statements; and if they prove erroneous they mislead a much larger number of persons: and it should be a principle of action on the part of Government, whenever it is not in their power to produce strictly correct accounts, to leave private individuals to make them on their own responsibility. With respect, however, to agricultural statistics, it needs be a vast national measure, co-extensive with the kingdom itself, requiring considerable and permanent machinery, such as no private energy can in any case supply; and, like the census of population, the statistics of education, or of crime, it behoves government to undertake it by the best means at their command. This duty government is about to assume, and it is all-important that all classes—the farmers, the merchants, the landholders, and the magistrates—should afford them their moral and physical co-operation. Let us now see what is the machinery at their command for such a purpose. At the suggestion of the late talented Mr. Porter, a statistical department was formed in 1832 connected with the Board of Trade. Such department has hitherto not extended its functions beyond the statistics of commerce and shipping, but the principle which it embodies is, that it should become a department for the registration of all the statistics of the country; that whilst the other offices are for administration, for direction, for inquiry, for legislation, &c., this should be for registration, or for the statistics of trade and commerce, population, agriculture, industry, crime, &c. A statistical department of such a character has been established in most countries. The statistics of agriculture should devolve on the Statistical Department of the Board of Trade; but that office would require to be expanded and reconstructed to undertake this important duty. The next statistical organization in this country is that of the Registrar General for births, deaths, and marriages. That office lately exhibited an unparalleled activity and ability for performance of labour, in the collecting of the census, by the wonderful machinery employed, by the expedition with which the returns were collected, and by the extent of the information obtained. This office has already ascertained the number of farmers in Great Britain, and also the number of farms, and their size. The plan they adopted was (the enumerators being above 30,000 in number) to deliver to every occupier of a house or tenement a householder's schedule, 7,000,000 in number, weighing in the aggregate nearly 40 tons. They trusted to the parties to fill such papers honestly and in the best way they could, and notwithstanding the difficulty of getting ladies to tell their ages, and many other local or personal prejudices, they obtained the most comprehensive returns ever published. The same plan could be pursued for agricultural statis-

tics as for statistics of population. Schedules might be annually sent to the 300,000 farmers, and the result, in course of time, would undoubtedly be as satisfactory as by any other means. In Belgium they pursued the same plan. In France they formed commissions and sub-commissions spread throughout the country, a most complicated and unsatisfactory process. The other statistical organization, which Government seems disposed to adopt, is the Poor Law Board; and it is by their instrumentality that agricultural statistics have lately been obtained for the counties of Norfolk and Hampshire. I confess I have a strong aversion to the machinery of the Poor Law for this purpose, and fear that the associations connected with it may prove injurious to the object in view. The plan pursued in the case of the foregoing counties was as follows:—The Poor Law Board sent schedules to the Board of Guardians. These were handed to the enumerators, or relieving officers of the parishes, who distributed them among the occupiers of the land, and got them filled up. A committee was moreover appointed by the Board of Guardians, consisting of some of the guardians and some experienced farmers, to inspect the proceedings; and where any farmer objected to give returns, to direct themselves to the proprietor himself or otherwise. The experiment proved successful. But it should be observed, that the counties of Norfolk and Hampshire are counties much advanced both in intelligence and resources.

With regard to Scotland, the Highland and Agricultural Society having succeeded in the statistics of three counties, they in all probability will be entrusted with the entire management for that part of the kingdom. In a letter addressed by the Secretary of that Society to the Board of Trade, the following statement was made respecting the mode pursued in collecting the statistics:—

“When the extent of acreage was collected, occupiers of land were informed that the report would be so prepared as to preclude the possibility of particulars in regard to individuals being divulged. The first return therefore only indicated the extent of the crops in districts comprising several parishes; and in conformity with this principle, the return now forwarded contains the estimated produce of the same districts. A record of the extent of the crops in every parish was then preserved, and a statement of the average produce of each has now been prepared; but as it was considered inexpedient to publish the details of parishes in the one instance, I presume it will be objectionable in the other.

“The machinery employed in obtaining the estimates was simple, and proved efficient. In every district there was a committee composed of the enumerators and experienced farmers, selected from, and representing each of the associated parishes.

“The nature and object of their services were explained in a circular addressed by me to the members of these committees before harvest, their attention was called to the standing crops, and they were requested to institute inquiry, and obtain information within their respective parishes. Their observations were continued during the progress of the harvest, and at a later period, when experiments in thrashing and weighing had been made, the committees were convened by their enumerators, the views of the members were compared and considered,

and a statement was prepared and forwarded to me, showing the average acreable produce of each parish, in bushels of grain and tons of roots.”

Such is the mode adopted by the Highland and Agricultural Society of Scotland.

It would remain now to notice that objections have been raised on the part of some of the farmers. They fear the results of such statistics—that such may be subsequently used to their disadvantage, either by imposing on them new taxes or by the raising of the rents, or that they are intended for some political purposes. Such objections it is all important to remove by convincing the farmers of the utility of such accounts, and by showing them their bearing on the price of produce, and on the public welfare. Sir John Boileau proposes that commissioners be sent throughout the country to extend information among the farmers on the subject of agricultural statistics; and though the plan would be attended with considerable expense, it would have the effect of removing any prejudice which may still exist against such statistics, and facilitate materially the obtaining of compendious accounts from the most distant provinces.

Having now expatiated on the expediency of obtaining such statistics, let us make some use of what are within our reach in this and other countries; calling your attention to the table of cultivated land, population, produce, and stock of some important continental States. We shall not follow the table which is appended, but offer some general observations on the principal topics it suggests. Russia by far exceeds any other country in the extent of soil under cultivation, but such is the disproportion which exists in the 51 governments into which that country is divided, that whilst two governments, Toula, and Tschervigow have 3-5ths of the land under cultivation, Astrackhan and Arkangel have no more than 1-1000th. The state of agriculture in Russia suffers materially for want of rain. The average quantity of rain is given as follows, by M. Gasperin, in French inches.

In the west of England.....	37 50
East do.....	26 56
West of Europe	26.12
Southern parts of Greece and France ..	34.43
Northern parts of France and Germany	25.64
Russia	15.88

Agriculture is also affected there by the want of population in many parts of the country, whilst in others it abounds. But the greatest evil inflicted on agriculture is the system of servitude which prevails. In 1834 the number of cultivators, serfs, or slaves, was above ten millions, or 46 per cent. of the total agricultural population.

Another important object in agriculture is the subdivision of real property. In France in 1835 there were as many as 10,893,528 distinct properties. In Ireland the number of holdings exceeding one acre in extent was, in 1852, 530,413. The produce of grain is largest in Russia; but the United States far exceed in the variety and abundance of other produce, especially cotton, tobacco, &c. The amount of cattle and sheep, in proportion to the population, is largest in Great Britain and Ireland. The United States have a larger number

of cattle, but Great Britain possesses double the number of sheep, whilst the United States have double the number of pigs. As to the value of agricultural produce, the census of the United States gives the cash value of farms at £900,000,000, and the value of farming implements at £32,000,000, that of live stock at £100,000,000. McCulloch gives the value of the crops of the British Empire at 120 millions sterling, and the value of land in England at 128 millions. The total value of the vegetable kingdom in Russia is given by Tegobonski at 260 millions sterling. These figures sufficiently demonstrate the immensity of the provisions which a gracious Providence has afforded to mankind. We have viewed the agricultural resources of but few countries, and left untouched Germany, Spain, South America, the East and West Indies, and Australia.

It has already appeared that the improvement of agriculture in this country has scarcely kept pace with the increase of population. In the report of the census of 1851, it is stated that the rate at which the population of Great Britain increased, from 1801 to 1851, is such that, if it continue to prevail uniformly, the population will double itself every 52.5 years. That is to say, the population of Great Britain, in 1903, may be expected to reach 42,213,934 souls, who will require 42,000,000 of quarters of wheat and wheat-flour per annum. Will Great Britain extend its productive forces in an equal ratio? Much has of late been accomplished in agricultural science. The great discoveries of chemistry, the results of meteorological observations, the extension and application of agricultural mechanics, the improvements made in the land by draining, by the removal of useless fences, by the diminution of four-footed game, by the introduction of new kinds of manures by irrigation, and by improvement of farm-buildings, have all considerably enlarged the prospects of British agriculture. The progress of agricultural science is greatly owing to the combination of scientific with practical instruction in agriculture. This science is now taught in the National Universities, where professorships of rural economy, agricultural chemistry, botany, and geology, have been established. Agricultural colleges and model farms, for acquiring acquaintance with the management of a farm, have also been introduced with eminent success; whilst the agricultural institutions—such as the Royal Agricultural Society of England, the Highland and Agricultural Society of Scotland, and the Royal Agricultural Improvement Society of Ireland—have contributed materially in encouraging men of science to turn their attention to agriculture, in promoting the discovery of new varieties of grain useful to man, or for the food of domestic animals, and in the spreading of sound information on all subjects connected with practical husbandry. Yet there is limitation even in productiveness and improvements. Political economy has brought to light a great principle in the law of production. Mr. J. Stuart Mill says—“Land differs from the other elements of production, labour, and capital, in not being susceptible of indefinite increase. After a certain and not very advanced stage in the progress of agriculture—as soon, in fact, as man-

kind have applied themselves to cultivation with any energy, and brought to it any tolerable tools—from that time it is the law of production from the land, that, in any given state of agricultural skill and knowledge, by increasing the labour the produce is not increased in an equal degree; doubling the labour does not double the produce.” Such being the law of production, and the quantity of land capable of improvement in the United Kingdom being limited, we must direct our eyes to emigration. A migratory character is the law of all human beings. Geology discovers the bones of elephants in the arteries of these northern islands. How they came here we know not. The back woods of America, the antipodes of Australia, are being peopled with the surplus of our population. In the last decennium, to 1851, we sent them as many as 2,688,746 inhabitants, and emigration is still proceeding at the rate of 300,000 a year. New empires are thus created—the bounties of the earth multiplied—civilization, commerce, and religion shed their benign influence into continents and islands. And though passions and ambition still control our actions, and wars and anarchy still infest our borders; though ignorance is still the lot of the masses—and though slavery still offers with impunity a sacrilege of God's creation in republican America—there is a future solemnly advancing, of newer life and newer principles—science, majestically revealing the machinery of the great universe—and our vision brightening beyond that starry firmament whose brilliant appearance raises our aspirations and ennobles our thoughts.

Reverting to our immediate subject, we have shown that the collection of agricultural statistics is an essential duty of the nation and of individuals—that it is a duty, the performance of which, demanding an extensive and permanent machinery, it behoves Government to undertake—that the difficulties to its performance are more ephemeral than real, and that the objections raised against it are inconsistent with the true interests of the nation collectively, and of the individuals composing it respectively. Also that such agricultural statistics may be collected, either through the Registrar-General, or the same machinery by which the recent census of population was collected, or through the Poor Law Board; and that, whichever means is adopted by Government, it is all-important that it be sanctioned by public opinion and strengthened by individual efforts. Lastly, that such inquiry is demanded by the uncertainty to which the people is exposed as to the amount of food it possesses within a certain time, with its ever-increasing wants—by the fluctuation which follows in the prices of produce, often doubling or reducing its value, even to the extent of cent. per cent., and by the necessity of having a timely warning of future wants. Farther, that it is a measure both expedient and necessary to the legislators to ascertain and study the wants, the resources, and the productive forces of the State whose helm they bear—to the jurist and moralist, to ponder over those moral phenomena so powerfully developed by abundance or indigence, by the prevalence or declension of agrarian crimes and offences against persons and property—to the merchant, to appreciate

the extent of the field into which he is to operate, to be prompt, energetic, and calculating in his speculation, or to be slow in giving credence to vague fears and apprehensions—to the shipowners, to afford sufficient amount of shipping to meet this imperative national want of

bringing food from afar—and to the farmer himself, to regulate his dealing in the market, to learn the productive capacities of the soil, and to establish the true basis for the adaptation and connection of science with agriculture.

AREA, POPULATION, AND AGRICULTURAL PRODUCE OF THE FOLLOWING COUNTRIES:

Countries.	Area in Acres.	Population.	Grain.	Horses.	Cattle.	Sheep and Goats.	Hs.
Great Britain .. Ireland	Under crop...16,000,000	Census, 1851. 21,121,977	England ..42,100,000 qrs.	1,161,000	15,400,000	48,000,000	13,275,000
	Under crop.... 5,695,347 (Return, 1853.)	6,551,976	Potatoes ..34,014,881 bush. Wheat 1,154,265 qrs. Oats .....11,712,528 Barley 1,257,398 Bere 231,075 Rye 63,289 Beans 83,187 Peas 37,634 Turnips .. 5,075,807 tons. Flax 5,673,934 { stns. { 11lb.	515,900	3,955,067	2,892,387	1,972,678
France	Under crop....72,000,000	Census, 1851. 35,781,628	72,000,000 qrs.	2,818,000	7,824,000	32,151,430	4,910,721
United States } of America... } (Census, 1850.)	Improved ....118,457,622	23,191,918	Wheat ..100,503,899 bush.	4,894,587	18,300,140	21,721,814	30,316,088
	Unimproved..184,621,348		Rye 14,188,639 Ind.corn ..392,326,612 Oats 146,567,879 Barley .. 5,107,016 Buckwheat 8,956,916 Peas & Beans9,219,975 Potatoes . 65,796,793 Do., sweet 38,259,196 Rice 215,212,760 lbs. Tobacco..199,752,616 Cotton .. 2,468,624 bales Wool 52,789,174 lbs. Flax 7,715,961 Mpl. sugar34,249,886				
Russia	Under crop... 213,000,000	1850. 68,000,000	180,000,000 qrs.	18,000,000	25,000,000	53,000,000	12,000,000
Prussia	Under crop... 9,012,762	1849. 16,500,085	80,000,000 qrs.	1,565,000	5,042,000	16,253,300	2,115,000
Austria	Under crop... 45,000,000	1851. 36,514,456	64,000,000 qrs.	2,850,000	11,657,000	33,767,000	5,092,430

NEW PROCESS OF MAKING BREAD.—A very remarkable exhibition took place last month at the Marylebone Workhouse, by Messrs. Morlan, Martin, and Journet, a French firm, who undertook to demonstrate before a committee of the board of guardians that, by a peculiar modification in the fermenting process, the amount of bread from a given weight of flour could be increased to at least 50 per cent. This singular method was invented by a French gentleman, a pupil of Orfila. Two sacks of flour were made use of, both under seal, and issued by the authorities of the workhouse. One of these was manipulated in the ordinary way, the other by the associated French manufacturers. The results were in the highest degree satisfactory. The first sack converted into bread by the usual method produced 90 loaves weighing 360lbs. The second bag of flour, placed in the hands of the French bakers, produced 134 loaves, weighing 520lbs., giving an increase of very nearly 50 per cent., under circumstances very disadvantageous to the owners of the secret. The place, the oven, and apparatus were all new and strange to their workmen, who had many difficulties to contend with. It was admitted by the spectators that in consequence of such drawbacks, there was a considerable waste of bread in the oven. There was a large attendance of scientific

men, as well as of bakers from the country and city, who witnessed the process with the keenest interest. All frankly and readily admitted that everything was above-board and fairly conducted, and that the result had exceeded their expectations. This marvellous increase in production does not arise from any weighty substance mixed with the dough, as no extraneous ingredient can be discovered in the loaf by the most rigid chemical analysis. The agency or properties employed must therefore be of a volatile nature, evaporating during the firing process. It is considered that the augmented produce must result from a power of the secret ingredients in checking the ordinary amount of loss of material in bread-making, escaping in gases on the application of heat. M. Martin, who was present during the whole day, stated that the newly-discovered mixture had a strong tendency to develop the glutinous substance in the flour, and that the nutritious element was by no means affected, much less sacrificed for quantity. The manager and other principal officers of the workhouse expressed themselves highly pleased with the exhibition, and viewed the new process as a great boon to the community at large, especially in these times of high prices. The saving to the country annually by the working of this new plan, would be no less than ten millions sterling.

CENTRAL (OR LONDON) FARMER'S CLUB.

THE APPLICATION OF MANURE IN A LIQUID STATE TO ROOTS, GRASSES, AND GRAIN CROPS.

The usual monthly meeting for discussion took place on Monday evening, April 3, at the Club Rooms, Blackfriars—Mr. J. Payne in the chair. Subject, introduced by Mr. W. C. Spooner, of Eling, Hants: "The Application of Manure in a Liquid State to Roots, Grasses, and Grain Crops."

After the CHAIRMAN had briefly opened the proceedings,

Mr. SPOONER said: Mr. Chairman and gentlemen, I fear that in appropriating to me the subject which is placed on the card for this evening, the committee have overtaxed my ability. When I first entertained the idea of introducing this important topic, I had no intention of taking so extensive a view: I thought that all I should be required to do would be to speak of the application of liquid manure to a particular crop, and little dreamt that I should be called upon to extend my remarks to various crops, and to bestow separate attention upon each. On referring, however, to the terms of the question as stated on the card—namely, "The Application of Manure in a Liquid State to Roots, Grasses, and Grain Crops"—I find that they afford me an opportunity of dilating in the first instance on that particular branch of the subject with which I am best acquainted, and of introducing what to many members will be a novelty; while, as regards the other branches, I see around me many gentlemen who are very capable of supplying any deficiencies on my part. I shall postpone the consideration of the various plans by which liquid or liquid manure is applied to the land, to a later period in my address; I will only mention at present what I think you will all concede, that, in order that liquid may be applied, either by means of irrigation or by means of gravitation, or by means of pipes and hose, combined with the use of the steam-engine, it is absolutely essential that there should be a copious supply of water (Hear, hear). I leave Mr. Mechi to tell you at what sum he values the spring which supplies his land with water. You all know—at least, all of you who reside in arable districts, or on sheep farms—that on the majority of farms (at least three to one) it would be almost impossible—I do not mean impossible in an engineering, but in an economical point of view—to supply a sufficient amount of water for the due irrigation of the land. I invite your attention to a plan by which, as regards roots, the difficulty may at once be obviated; and, speaking more particularly of which, I will undertake to say that where a moderate supply of water can be obtained from a distance of a mile or a mile and a-half, there is in a dry period no occasion for putting in one single acre of turnip-seed without at the same time applying sufficient moisture to enable it to vegetate. Perhaps it is desirable that I should here call your attention to the great variation in

the amount of rain which falls in different parts of England. I find, then, that at Seathwaite, in Cumberland, there was in four years an average of 146 inches of rain, or the prodigious quantity of 4,600 tons per acre, in the course of the year. During the same period the fall at Cambridge was only 20 inches, or 2,000 tons. In London the quantity was about the same; at Thetford, about 5 per cent. less. The average fall of six places was 22 inches on the eastern side, 25 in the middle, and 43 in the west; the total average of the whole country being 30 inches, or upwards of 3,000 tons per acre. You know very well that the various manipulations of husbandry can be best carried on while the soil is in a dry state. On the other hand, I think you will agree with me that seed will not vegetate properly unless land be moist to the depth of three or four inches; and when you consider the vast outlay that, under ordinary circumstances, is incurred where water does not abound, you will, I am sure, agree with me that it is highly desirable to possess the best and most economical means of obtaining a supply (Hear, hear). It should also be borne in mind that if liquid manure be applied on the broadcast system, by means of what are called distributors, perhaps one-half of it, or even two-thirds, will sometimes evaporate, and thus half the expense will be abortive. Having for some years been in the habit, not only of putting in turnip-seed on my own farm, but also of supplying manures, my attention has been directed to the best means of applying liquid. A drill was invented some years since by Mr. Chandler, for the deposition of liquid manure; and this has been constantly gaining ground; so that every year an additional number of acres have been put in by means of the liquid drill. Observing, however, the defects of this implement, it occurred to me that they might be obviated; and at the same time I felt that there were a great number of farms in this country where a drill by which either a large or a small quantity of water could be delivered along with the seed, surrounding the seed and causing it to germinate, was a desideratum of the greatest importance. Some of you may be aware that the liquid manure drill to which I have called your attention consists of an iron box, in which revolve a number of buckets. The liquid and manure having been deposited in the box, is taken up by the buckets, by which it is poured down in shoots, and thus it enters the earth. The chief objection which struck me was this. The mixing and stirring up of the liquid depend on the rotation of the buckets: when the drill arrives at the end of the field, it takes perhaps two minutes to get again into action; during the time which elapses a great deal of the manure sinks to the bottom, and the result is, that in some parts of the field there is deposited

a large quantity of solid manure, and in other parts a small quantity. A very simple experiment will afford an illustration of what I mean, and show you that what I have stated is correct. If I take a small quantity of soluble superphosphate of lime, and mix it with a certain quantity of water, after it has been allowed to remain a short time you will observe the kind of effect which I have stated. [Experiment here performed.] I put into this vessel (holding up a glass) two drams of superphosphate of lime, and I add two ounces of water. It is hardly necessary for me to observe that superphosphate of lime is perhaps the most soluble manure with which we are acquainted. The very purpose of converting a phosphate into a superphosphate by means of an acid is to render it soluble, in order that the water which abounds in the earth, or the water which falls from the sky, may bring it speedily into action, instead of the plant being allowed to languish for want of nourishment. I wish you to observe, however, that although this superphosphate of lime is in a very soluble state, there is not on the average above 16 or 17 per cent. in actual solution; the remainder retains its natural form. [The experiment was here completed. Two minutes were allowed to elapse after the water and the superphosphate of lime were mixed together, at the expiration of which a very large proportion of solid matter remained at the bottom of the glass.] No one will deny that if the seed in one part of the field receives the chief part of the liquid manure, while in other places the manure deposited is principally solid, the result will not be such as one would desire. It resembles too much the law of primogeniture, under which one child receives nearly all the property, and the rest scarcely any (laughter); or it is like a number of persons being invited to a feast, and one portion of the guests getting good beef and mutton, and the rest nothing but toast and water (laughter). You know that a great deal of satisfaction is often expressed at the result of the application of liquid manure, and I have no doubt that it is attributable in a great degree to this cause. There is often great inequality; and it is obvious that that part of a field which receives the larger share of the manure is likely to be the most productive. Now not only is that drill imperfect, for the reason which I have mentioned, but the mode of putting in turnips which is prevalent in Hampshire and the west of England—namely, by mixing six or seven bushels of manure with thirty or forty bushels of ashes—is one by which it is impossible that anything like accuracy can be secured. The chemist will tell you that, if he wants to obtain an accurate combination, he must weigh out the different ingredients, and combine them in small and certain proportions. But in the rough and ready way in which the work is commonly done, you have one part of the heap of ashes abounding with manure, while another part consists almost wholly of ashes. Gentlemen who have been in the habit of walking over large fields of turnips must often have had their attention directed to the vast difference between the size of one root and that of another. Nothing is more common than to find in one place a swede weighing eight or nine pounds, and in another place—on the very same soil, and under

apparently the same conditions—a puny root not exceeding two or three pounds (Hear, hear). I do not mean to assert that the sole cause of this is the difference of manure; but I think you will agree with me that probably the most important cause is the different proportions in which manure is supplied to the plants. Now the object of my invention—for as such I may speak of the implement on the table [referring to a drill cart]—was to obviate the defects which I have mentioned. By this implement, we do away with the necessity for using ashes. A small quantity of ashes may still be used, but it is practicable to apply liquid manure without any ashes at all. The manure is deposited by this implement with the utmost accuracy. There are different boxes in which the manure is put. At the lower part of each box there is a fixed smooth cylinder, with another cylinder with equal rectangular compartments moving round the former. The great advantages of this arrangement are that there can be no possible lodgment of manure; that either a very small quantity or a very large one can be applied with precision; and that bones, superphosphate, or any kind of manure can be used with equal facility. The water vessel is a tank situated at the front of the drill, and is divided into compartments. The advantage of this arrangement you will see at once. If there were one uniform tank, the difference of level between one part and another on hilly ground would be so great that you would not be able to fill the tank more than three parts full; whereas, when it is divided into different compartments, the height of one above the other is so slight that no inconvenience is ever experienced. I should state that at the bottom of each compartment there is a brass cock; this is set in motion by a rod which moves certain small wheels, so that the whole of the cocks can be opened at one and the same time; and it is possible to apply one hogshead per acre or twelve hogsheads with equal facility. [Mr. Spooner here gave some further detailed explanations of the action of the machine, with the aid of the machine itself.] I called attention just now to the important fact that, in order to wet the land to the depth of three or four inches, it is necessary that 100 tons of water per acre should be deposited. I find that, taking dry earth, if you use one-fourth you just wet it; if you apply one-third, it is not excessively wet; and you must apply one-half before a single drain will run. Now, what is the quantity requisite to secure the germination of the seed? So small an amount as four or five hogsheads per acre. It is found in practice that, when water lies at so small a distance as a mile or a mile and a-half, three water carts are sufficient to supply the drill; and, consequently, it is as easy to convey the requisite quantity of liquid to the drill as it is to convey manure mixed with ashes in the ordinary manner. It may be thought by some that, with so small an application of water, the seed might swell and germinate, and then die for want of continued moisture. In order, however, to obviate any objection on this ground, we have small tines following the coulters of the drill, and throwing in as much earth as may be required; and by this means evaporation is entirely prevented. I may be asked whether there is any advantage over and above the ger-

mination of the seed in applying water. I maintain that there is not. I have ascertained by experiment that for the first two or three days the seed is as well or better without manure than with it. Be this as it may, however, the object of applying water—and on this I rest my case as regards the implement before me—is that the seed should germinate; and if it does this, there will be sufficient communication with the damp soil below to cause the plant to vegetate, and to proceed in a healthy manner with the aid of the manure which is deposited. We have found in practice that a plant has appeared above ground in three days from the time when it was put in the ground, and this it will not do in the ordinary way. This implement is, in fact, constructed on the old English victuals-and-drink system (laughter). Does the plant want something to eat?—Here is that which will supply it with food. Does it want something to drink?—Here, again, is that which will meet its wants. I will now pass on to another part of the subject, which may perhaps be more interesting to many gentlemen present. Some of you may, perhaps, suppose that however applicable an implement of this description may be for such land as I have referred to, yet where the steam-engine can be applied for the purpose of pumping liquid manure on the land, such an implement as this can no longer be required. To that opinion I cannot assent, because I think that one advantage of this implement is, that by depositing the liquid in rows, and in rows alone, you cause the seed to germinate; and the result is, that the plant gets the start over the weeds, which is by no means a slight advantage. (Hear, hear.) You know there are various means by which liquid and liquid manure can be applied to the land. I referred for a moment to the broadcast system, or the system of applying it by means of carts. I am persuaded that that system deserves scarcely a moment's consideration. (Hear, hear.) Under that system you must apply a very large quantity indeed to have the smallest chance of doing any good; and when you consider that to carry the manure a distance of three-quarters of a mile involves an expense of sixpence per ton, or about £2 an acre, you must, I think, admit that that system ought to be altogether set aside. I have been somewhat surprised to find that the Royal Agricultural Society of England—than which there is not a better or more noble society in the kingdom (cheers)—has for several years past offered prizes for what it has been pleased to term liquid manure distributors, as if the *summum bonum* of good farming consisted in that which has such economical difficulties to combat, that in point of fact it can be of no advantage whatever. The credit of the improvement in this respect is chiefly due, not to the society, but to its excellent president; it was Mr. Pusey who proposed the prize for water drills at the last meeting, and I am happy to say that his proposal was duly responded to. I cannot help thinking that if pipes are brought into use, and if a copious supply of liquid manure be obtained, the expense and inconvenience of the old system will soon be got rid of. The hose being ready, by one and the same operation a field may be irrigated and the drill may be filled; and I anticipate the

greatest advantage from the extension of the system. In an early part of my address, gentlemen, I alluded to the very extensive and weighty character of the subject which I had undertaken to bring before you. Having examined the matter with minuteness and care, I am of opinion that on many farms, where a good supply of water can be obtained, the application of liquid manure, with the aid of pipes and hose, is calculated to secure great benefits. You all know perfectly well the great advantage which has been obtained in the neighbourhood of Edinburgh, in consequence of the sewage of that city running over a large quantity of meadow land. The effect of this has been considerably to enhance the value of the land, and I believe that in some cases a rental of something like £30 per acre has been obtained. So many accounts of this have been laid before the public in various forms, that it can hardly be necessary for me to detain you with any details; and I would only observe, therefore, that great as may be the advantage which has been secured in the vicinity of Edinburgh, yet, considering the size of the town and its situation, there can be no doubt that these advantages might be considerably extended. (Hear, hear.) With regard to the Board of Health, I must say I cannot congratulate it on having done much as yet in the practical disposal of sewage. The engineers, with the talents and facilities they possessed, have wasted much time in following a wrong course. Instead of proceeding step by step; instead of first going to a chemist, and inquiring what was the value of the various substances contained in the manure, they have gone, for example, to the town of Southampton, and advised the inhabitants to incur a considerable expense in endeavouring to render the manure solid. The consequence has been a complete failure. In my opinion, a valuable solid manure cannot be profitably obtained from the sewage. Sewage can only be applied advantageously by gravitation, or, what is, I think, better, by means of pipe and hose. A system which has been adopted to a great extent—to a much greater extent, perhaps, than most of you are aware—is that of applying liquid manure without having recourse to any of the sewage of towns; and perhaps this is the best mode in which farmers can avail themselves of the abundant sources of manure, in bones, guano, &c., in order to obtain the largest amount of green produce. There are twelve or fourteen instances of the successful adoption of this plan. Many of you may have seen the book which I hold in my hand; it is entitled, "Minutes of Information collected on the Practical Application of Sewer Water and Town Manures." In looking over this book, I was reminded of the play of "Hamlet" with the part of *Hamlet* left out; for, although it professes to treat of the sewage of towns, scarcely four pages are, in fact, occupied with that subject, the greater part being taken up with the means by which liquid manures can be applied most profitably, and the expense which attends various modes of application. I have taken a note of some instances in which the plan I have just mentioned has been successfully adopted. I merely mention these cases to show that there are numerous practical instances. Mr. Lee, the civil en-

ginger, estimates the expense of laying down the necessary iron pipes on a farm of 675 acres at £2 2s. 1d. per acre; on a farm of 1,000 acres at £1 14s.; on a farm of 16 acres at £1 16s.; on a farm of 11 acres at £1 14s.; whilst he reports an actual case of a farm of 107 acres being furnished with liquid manure by means of pipes and hose at an expense of £198, or £1 17s. 1d. The average expense in the various instances to which I have referred is £1 16s. 9d.—that is, the expense of laying down pipes, with the various requisites attending their operation. You must now allow something for the increased cost of iron, and perhaps a little margin besides for excess of outlay over estimates; for it is almost invariably found that engineers exceed the sum stated (Hear, hear). Allowing the utmost latitude, however, I think I may fairly set down the expense at £2 2s. 11d., which gives at 7½ per cent. an outlay of 3s. 2½d. per acre. I would much rather state the cost, however, at 5s. per acre; and if that be correct, I really think the result cannot be otherwise than profitable where there is an abundant supply of liquid manure (Hear, hear). One of the most interesting portions of the report is an account of a very small farm in Sutherland, and I am induced to refer to it in order to meet the possible objection that a system which does very well for a large farm might not answer on a small one. Here is a little farm of 40 acres, called the Myer Hill, near Ayr. The tank cost £30; engine, £60; iron pipes and hydrants, £100; distributing hose pipe, &c., £20: making a total of £210. The annual interest on the £210, and wear and tear, are £15 15s.; wages and fuel, £11: total, £26 15s. This amount, says the report, divided by the number of acres, is only 13s. 4½d. per acre, when spread over the whole 40 acres of land. The liquid manure is applied to all kinds of crops upon Mr. Telfer's farm; and though Italian rye-grass is the favourite, it is also used for turnips, mangel wurzel, and cabbages, rhubarb, and fruit. In summer the cows have a quantity of oil-cake, as well as grass; and in winter they have turnips or mangel wurzel, bean or barley meal, and cut hay or grass; the whole mess being steamed together. Miss Bell, the cousin of Mr. Telfer, manages the dairy, and said that the previous year the hay bought would amount to from £30 to £40, and the grain to not less than £200. In general terms, the other food is produced upon the farm. As to the produce of grass, which is the chief article, the first cutting during the present year was in the latter end of March, about 18 inches thick. The second was from 18 inches to 2 feet thick. The third was from 3 feet to 4 feet 6 inches thick. The fourth nearly the same. The fifth was 2 feet thick; and the sixth, in process of cutting at the time I was there, we measured at 18 inches thick. Taking the mean, where two dimensions are given for the same crop, I find the aggregate depth of grass grown and cut off this farm, within seven months, to be not less than 14 feet 3 inches. All this is, however, eaten upon the premises, and the whole marketable produce of the farm is represented by the milk and butter. As to the quantity and value of these, Miss Bell stated that the previous week the butter was 14lbs. and 120lbs.—together 234lbs.—sold at 1s.

per lb. This, she stated, was about the average quantity and price. The amount for butter would therefore be £11 11s. per week, or per annum £608 8s. She informed me further, that during about eight months in the year the cold milk realizes about the same amount as the butter. In the summer months, during hot weather, the market value of the milk is only about half that of the butter. From these data, the amount for milk sold per annum is £507. The total receipts for the two articles of milk and butter amount to £1,115 8s. per annum. I only need to add that, previously to the adoption of the present system of farming, these 40 acres of land were barely sufficient to support eight or nine cows, and would have been well let at a rental of 30s. an acre. I have referred to this farm as an illustration. Surely if this can be done at a profit on a small scale, it can be done still more profitably on a large one. The case which I have cited is, indeed, that of a dairy farm (Hear, hear), and such a farm is, of course, profitable in proportion as there are facilities for disposing of the butter and milk; but, allowing for this, I cannot but think that a similar plan might be advantageously adopted in many parts of the country. You all know that to raise liquid manure to any considerable extent by means of water carts is a work involving considerable expense for labour; whereas, when distributing hose-pipes are used, after the manure has been raised to a certain point, no more power is required. In this interesting work, various modes of proceeding are laid down. I will not, however, detain you any longer on this part of the subject, as there is a gentleman present who, having tried experiments on his own farm, will be able to illustrate it much better than I could do. I will, however, observe—and, indeed, it must have struck almost every one—that it is far more profitable to apply liquid manure to the grasses than to other kinds of crops. In many instances the crop of grass, particularly of Italian rye-grass, has been much more than quadrupled. Fourteen feet have been obtained by successive cuttings. As regards irrigation, we find that during three months of the year nearly the whole of the rain that falls is evaporated. From 1836 to 1843 the average fall was 26 inches, of which amount 42 inches filtrated and 57 inches evaporated. We have, too, this remarkable fact. From April to September, out of a fall of 12 inches 67-100ths, nearly 12 inches, or 92 per cent., evaporated. During that period 91 tons only filtrated, and 1,192 evaporated. On the other hand, from October to March, 14 inches fell, of which only 10 inches, or 75 per cent., filtrated, while 3 inches, or 25 per cent., evaporated. In other words, 1,000 tons filtrated, and 360 tons evaporated. I draw attention to these facts, because they have a most important bearing on cultivation. You cannot expect, gentlemen, to obtain by any efforts which you may make, as large an increase in corn crops as in grass crops. (Hear, hear.) To whatever extent you may apply manure, it appears to me almost impossible for you to double your corn crops, whereas there seems hardly any limit to the increase which you can secure in grass crops. (Hear, hear.) What is true of grain crops is likewise true to a great extent of root crops. I do not

mean to say that you cannot increase your root crops; you undoubtedly may increase them considerably by using plenty of water or liquid manure; but I doubt whether you can double even them. I have purposely abstained from speaking of the system of applying liquid manure adopted by Mr. Mechi, because he is himself present. I have observed that the system adopted in his farm answers perfectly well; I mean that of pumping air in the tank, so as to keep the manure in perpetual motion, and to hold the solid manure suspended. Whether it would not be as well or better to apply the waste steam of the steam engine for the same purpose, is a question which I will leave for the consideration of others.

Mr. CUTHBERT JOHNSON was sur he expressed the feeling of every gentleman in that room when he said that the lecture that they had just heard from Mr. Spooner entitled that gentleman to their thanks. Mr. Spooner had given a rapid scientific sketch of the various applications of liquid manure; and he (Mr. Johnson) entirely concurred in the opinion that if liquid manure were applied by means of a steam-engine, which he considered the legitimate and the most economical mode of proceeding, its application to grass lands was most advantageous. He used the word economical advisedly; because, in the researches which he had from time to time made amongst the farmers of this country, he had been accustomed to put an old-fashioned inquiry—"Will it pay?" (Hear, hear.) With regard to grasses, the quantity which might be used advantageously was, he believed, almost unlimited. It had been found by various experiments that not only was it advantageous to apply liquid manure by its own gravity, in situations where farmers had the benefit of an upland spring or an upland source of supply, but that it was also useful and remunerative to raise it by means of the steam-engine (Hear, hear). This would appear, he thought, from what he was about to mention. During the last autumn, when he had the pleasure of spending about two months in Devonshire and Cornwall, he was struck with the luxurious appearance of the grass land in that part of the country, more particularly in Cornwall. When he got upon the grass lands in the very extremity of England, on a granite formation of hard and almost bare rock, he was surprised to learn from the farmers of the neighbourhood that this thin-skin land, not more than three inches from granite, was able to support a cow per acre all the year round. He naturally asked how this happened; and he was told that in Cornwall the average fall of rain was 44 inches. It should be remembered, that an inch of rain represented as nearly as possible 100 tons of water per acre. In the county from which he came, the county of Surrey, the average fall of rain was about 25 inches; and therefore the farmers on the grass lands in the parish of Sennan had 2,000 more tons of water per acre than fell in Surrey. On learning this, he began to ask himself, "May not we who live in the neighbourhood of London, where there are only 24 inches per acre, introduce on our land at a moderate expense the additional 20 inches?" He sat down and made the following calculation: He found that 224 gallons of water made one ton. The 20 inches deficient

represented 2,000 tons of water, equal to 450,000 gallons; and this quantity might be raised 20 feet by a Cornish engine for an expenditure of about 5s. worth of coals. On this point he spoke confidently; because in the parish of Croydon they had to raise for the daily supply of the town about 500,000 gallons of water, having to raise it 142 feet, and the coals cost 5s. As regarded the sewage, he must observe that it was difficult to say what was meant by liquid manure. When he talked to foreigners about Mechi's liquid manure, he was often asked by them what was its specific gravity or strength; and all he could say, in reply, was that it was no doubt very good stuff (laughter). Now, he would take for his datum the sewage of large towns. It happened that, whether the sewage was discharged from London, Edinburgh, or Croydon, the amount of solid fertilising matter varied from one to half an ounce per gallon. In order to be safe in his calculation, he would take the minimum—half an ounce. What, then, was the result? Supposing that they were to apply 450,000 gallons of sewage, and that the average amount of solid matter was half an ounce per gallon, the result would be that seven tons of solid matter per acre were applied to the land. They might regard the liquid in whatever light they pleased: they might regard it as pure water; they might regard it as rain water, which it was well known contained a small percentage of ammonia; or they might regard it as the sewage of towns, in which form he need scarcely say it contained most valuable ingredients; and in each of those points of view they would find its application to the land most valuable and important to the farmer. As he observed before, however, the great question was whether the application of liquid manure would pay; for if it would not pay, even though scientifically correct, it would be of no real advantage (Hear, hear). He left it, therefore, to the gentlemen present to consider whether, if twenty inches of rain water per acre could be raised by means of an engine for an expenditure of 5s. for fuel, the result would not be worth the outlay ten times over (Hear, hear). He referred especially to fuel, because the expense of providing a stoker would be comparatively trifling; the great outlay would be for coals; and he submitted that the result must, in fact, be very profitable.

Mr. A. RUSTON (Chatteris) wished to make a few observations with regard to the use of the liquid manure drill. Many farms were not adapted to the system of irrigation on an extended scale; but all were, he thought, adapted to the use of the liquid manure drill. It had long been a subject of anxious inquiry to the farmer, how to produce the best crop of roots. A great variety of artificial manures had been brought to his aid, and he had undoubtedly made considerable progress during the last ten or fifteen years in the cultivation of turnip crops. Still there were difficulties arising from natural causes that he had had to contend with, and which he had been unable to overcome. The liquid manure drill appeared to him, however, to be adequate to effect the removal of those difficulties; he alluded to the drought and the fly. In the eastern counties of England the fall of rain was much less than in the western; and the drought frequently so

interrupted the growth of turnips, that the crops came up irregularly, and gave the fly an opportunity of committing very extensive ravages. Last year many crops had, on this account, to be sown a second time. Whilst in the north of Lincolnshire, he visited a field in the Wolds, where the process of sowing turnips was going on, partly with the liquid manure drill (Chandler's) and partly with a dry drill. The comparative merits of the two methods might be tested by the following results:—

Experiment.	Quantities of Manure per acre.	When sown.	When weighed.	Weight per acre	Cost per acre of Artificial Manure.
1	10 loads of yard manure, 2 bush. dissolved bones, sown with liquid drill.....	June 17.	Nov. 15.	ton. cwt. 22 15	s. d. 14 0
2	10 loads of yard manure, 6 bush. bones, 12 bush. ashes, sown with dry drill.....	June 18.	Nov. 15.	17 1	15 0
3	2 bush. bones dissolved and sown with liquid drill. No yard manure	June 24.	Nov. 15.	18 15	14 0

(Hear, hear.) If such results as these, then, were produced by the adoption of the liquid manure-drill, surely it was worthy the attention of every root-growing farmer. For his own part, he believed, from observation and experience, that they would be common and frequent. He himself was engaged in sowing from 40 to 50 acres of mangel-wurzel; he sowed precisely the same amount of artificial manure per acre with the dry drill as with the liquid, and he intended to publish the results in the autumn (Hear).

Mr. OWEN (Clapton) bore testimony to the utility and value of Chandler's drill on farms of a gravelly nature. The liquid manure drill was preferable to the dry, more especially where the farmer happened to have got behind with his sowing. He had used Chandler's drill on a dry soil about the second week in July, sowing, for turnips, 2 cwt. of superphosphate, with 1 cwt. of guano, mixed with a portion of ashes. He found no difficulty in working Chandler's drill. Perhaps Mr. Spooner had had more experience than he (Mr. Owen). He confessed, however, that he could discover no defects in it in mixing the manure: because there was a lever with prongs attached to it, which stirred up the manure with the water; these prongs were constantly at work, and upon looking over his fields he saw no defect, but everywhere an even plant of turnips. In seven days after drilling, though it happened to be a dry season, the plants were up and showed well, and in less than three weeks they were all fit for the hoe. Had he sown them with a dry manure drill, he believed they would have been a week or ten days later, with regard alike to their appearance in the field and their fitness for the hoe. He strongly recommended the drill. The advantage of its use was very great, and that it was not more generally applied he attributed to the want of water. Had he a river running through his farm, he would never again sow a turnip without the liquid manure drill. True, the implement might be susceptible of improvements, and Mr. Spooner's might possibly have those he spoke of.

But he could confidently recommend Chandler's drill as greatly superior to the dry manure drill.

Mr. MECCHI (Tiptree) believed that, from the facts which had been laid before them, they must have arrived at the conclusion, that if liquid manure could be economically applied to the land, it must be highly advantageous for particular crops. His own experience had taught him that it was a profitable method as carried out by himself. As practical men, they would agree with him, that in farming, as in every other pursuit, unless a thing could be done so as to make a profitable return, it had better not be done at all (Hear, hear, and a laugh). He had two miles of pipeage on a farm of 170 acres, and previous to laying down his system of pipes he endeavoured to ascertain what others had done before him, with the view of following in their steps, and adopting such improvements as might appear to be necessary. Let them just compare the application to the land of liquid manure, and the application of solid. They carried out a certain number of loads of dry manure at a cost of 6d. per ton per mile. They then had to spread it and plough it in. They next had to wait for rain to wash it into the soil; and probably the rain when it came at that particular part of the summer was barely enough to carry it down two or three inches. But by means of the system of irrigation, what took place? The manure which fell from the animals to-day was washed into the tank to-morrow, conveyed on to the land, and ploughed in a depth of three, four, or five feet, at a cost of something like five-farthings or three halfpence a ton. (Hear).

The CHAIRMAN: Do you mean feet or inches?

Mr. MECCHI: In putting on the liquid manure, the ground was saturated to the extent of three, four, or five feet (Hear). He termed it "ploughing in" because it penetrated the soil according to the depth of the drains (Hear). He had sometimes made his drains run in a stream at a depth of five feet with coloured liquor. That showed to what an extent liquid manure penetrated the ground, and mixed with the subsoil. If they could put a ton of manure in a liquid state, anywhere within a mile, for five-farthings or three-halfpence, deeply in the soil, surely it was far cheaper than doing the work with horse and cart. We had only four months which could be properly termed "growing months" in this country; and when we had the greatest amount of heat, we really wanted the greatest amount of moisture. The use of liquid manure enabled the farmer to do this. After tares, he might put in his turnips, as he (Mr. Mechi) had done last year early in July, on what was naturally a very barren soil, and upon which he had grown 23 tons of white turnips per acre, and 19 tons of swedes per acre. They were put close, certainly; but they were considered much better than the crops in the neighbourhood raised from solid farm-yard dung. The result was highly profitable, for he had had no carting of solid manure, but only two ploughings and a scarifying to scour the ground. On all kinds of green crops he believed the system would prove beneficial; and the best proof of that was, that where it was adopted double the amount of live stock might be kept per acre, without

any additional expenditure for the purchase of artificial food. One of the great tests of successful farming was the amount of live stock that a man could maintain on a given number of acres. If he doubled his stock he doubled the quantity of his manure, and if he doubled his manure the chances were that his corn crops would be considerably benefited (Hear, hear). There was no difficulty in the matter at all, excepting as a question of investment (Hear, hear). He did not think that the statement published by the Board of Health, as quoted by Mr. Spooner, included all the expenses; but he thought it might be safely calculated that iron pipes could be laid down, a steam-engine erected, a tank dug, and gutta percha hose supplied, and the whole be in full working order (even at the present price of iron) for £6 an acre. His own apparatus cost him £15s. an acre, including everything; but at that time iron was much cheaper than it is now. But if they expended £6 an acre, and charged themselves 7½ per cent., and also the working expenses in coal, they would still be considerable gainers. Their horses would be at their service for ploughing and other work, instead of carting out manure, which had then to be spread over the land, and bringing the empty carts back again. It had this advantage also, that all kinds of grasses would be brought forward more rapidly in the spring, and continue their growth late in the autumn; so that in his own case, while many of his neighbours were short of food, he had an abundance. Of course a considerable supply of water was requisite; and if there happened to be a bog on the farm, as was the case on his (Mr. Mechi's), and a deep drain were put into it, which supplied 30,000 or 40,000 gallons of water in the course of the day and night, there would at once be a treasure to them. If any person would offer him £3,000, or the value of the fee simple of his farm, to take away the spring in that bog, he would decline the offer, because he was sure he could make more by retaining it on the farm than by investing the money in the funds. The question under discussion had an important bearing on the sewage of our towns and the waste of manure which daily occurred. They were now almost crying about the supplies of guano, which was nothing more than bird's dung; but if farmers, and landlords, and the inhabitants of towns were so inclined, there could be no practical difficulty in effecting the conveyance of the sewage of towns to the fructification of the country (Hear). He would undertake to place a well by the side of any one of the London sewers, lay down iron pipes, erect a steam engine, and transmit through the country every drop of sewage that ran down that drain. The operation was a simple one, and it had been calculated that a pipe three feet in diameter, with a glazed surface, was sufficient to conduct the whole sewage of the metropolis. He knew that that was a bold assertion, but he believed that half-a-dozen force pumps, as a force pump of a yard in diameter, placed against the sewer before it entered the Thames, would prevent a single drop of sewage from falling into the river, and send it, by means of pipes, throughout the country. But what was the use of doing that, unless farmers and landlords were prepared to submit to an act of parlia-

ment that would cause it to pass through their land, and the tenants be inclined to pay for it when it reached their doors, and lay down lines of pipes to carry it over the farm? The question was, if it would pay? Well, upwards of £400,000,000 of money had been spent in the construction of railways, because it answered the purpose, and the parties who had money to invest in this description of security were satisfied with a moderate per-centage on their capital. And he had no doubt that, in the course of a hundred years, posterity would look back upon the present generation with sentiments akin to contempt or disgust, for having permitted that which in the course of a few years cost hundreds of millions in the shape of food for the people, to be afterwards sent down the river, instead of back to the land for the purposes of reproduction. He could not concur in the opinion that liquid manure was not applicable to every description of crop. He believed it to be equally applicable to cereal, leguminous, and root crops. Let them not be afraid of making their land too rich if they had plenty of liquid manure. If afraid of having too much wet, draw out the roots, feed off them, and then raise a cereal crop: for he contended that, wherever a crop of roots was taken off, and a cereal crop followed, the application of liquid manure would be very remunerative and beneficial.

Mr. GRAINGER thought there was a liability to produce mildew in the application of liquid manure.

Mr. MECHI.—Not at all, except, perhaps, on rich black soils; but the great bulk of the soils of this country were of a heavy, tenacious character, requiring a great deal of food and amending below the plough; and to such soils it could not be injurious. But to carry out the system effectually, he was of opinion that their animals should be kept on boarded floors, and consume the straw with oilcake and other matters. They must use steam-engines; and, what was more, instead of their village blacksmiths they must have engineers close to their doors (a laugh).

Mr. OWEN.—How about the pocket (much laughter)?

Mr. MECHI.—If agriculturists were so poor as not to be able to adopt these improvements, they had better farm a less quantity of land and cultivate it well, than hold a large number of acres and cultivate it badly (Hear).

Mr. J. WOOD (Cuckfield).—What had come out to-night created an inclination greater than he had before experienced to visit Tiptree Hall; for he had heard of many things which had been successful there, which in his hands, he was sorry to say, had proved utter failures (laughter). For his own part he did not see how the pipes necessary to convey the liquid manure could be laid down without interfering with the culture of the soil. The expense of the apparatus, too, must be very considerable, particularly at starting; and he should advise the use of much caution before commencing to incur the expense. He felt the weight of Mr. Mechi's observations with regard to the advantages of liquid manure in causing seeds to germinate; and also what Mr. Spooner had said, respecting the increase of grass being so much larger than in corn and root crops. He

could conceive that grass might be continually mown and never fed on; but in the case of corn, if they got a little beyond the mark they had better not have it at all, for it would go down and be spoiled. Moreover, on many descriptions of soils, he was afraid that blight might follow. Of course the application of liquid manure would depend to a great extent upon the judgment and discretion of the farmer, and his knowledge of the soil on which he worked.

Mr. MECHI.—The details of the cost, &c., he had supplied to Blackie's "Cyclopedia," to which he must refer gentlemen.

Mr. GRAINGER (Stretham, Ely) had no doubt that liquid manure might be applied advantageously to roots and grasses; but not to grain crops.

Mr. MECHI.—Have you tried it?

Mr. GRAINGER.—I have not; but I fear that it would be productive of mildew.

Mr. WALLIS (Overstone) said that the experience of last year was sufficient to prove that a great amount of moisture applied to the grain crops was detrimental to production. Even in the case of root crops it was so (Hear). He had always grown the best crop of mangold-wurtzel when there was the least quantity of moisture, provided there had been moisture enough to cause the seed to germinate in the first instance (Hear, hear). That drills of the description referred to might be advantageously used in the primary stages of a root crop, no one could doubt. And to grass crops, especially where they were mown, great good might accrue from the application of liquid manure. With respect to grain crops, however, he thought harm might be done by any extensive addition being made to the moisture supplied from the clouds.

Mr. J. HOWARD (Bedford) said some allusion had been made to a defect in Chandler's drill. He begged to say that he had visited several farms where the drill was in use, and had seen several crops grown after it, without having discovered the defect, namely, that at the ends more manure was put into the soil than at the middle. The most even crops had, to his knowledge, been grown after Chandler's drill; and so satisfied was he with its efficiency, that he had ordered one for his brother this season.

The CHAIRMAN was inclined to concur with Mr. Wallis in the opinion he had expressed, that it was essential to use the liquid manure drill at the first starting of root crops, turnips and mangold-wurtzel, but it could not be generally practised with a good result in the case of corn crops. With those gentlemen who advocated its application to grasses he entirely agreed. There the use of liquid manure was deserving of the highest commendation. On most soils it would be more advantageous when applied in that way than in any other. He had been an extensive and successful grower of mangold for many years, and had always found that when once he had got the seed to germinate and the plant to start, he had no reason to care how dry the season might turn out to be (Hear). Indeed, he thought that the drier the season the better was the crop (Hear), and that if there were sufficient moisture to enable them to close to-

gether, so as to prevent the ravages of the fly, even turnips required less moisture than many persons imagine (Hear, hear).

Mr. SPOONER having briefly replied upon the preceding discussion, the following resolution, moved by Mr. Owen Wallis, and seconded by Mr. Mechi, was agreed to:—

- 1st. That it is very desirable, in the sowing of turnips or mangold-wurtzel, that vegetation should commence as soon as possible after the seed is committed to the earth. That the water drill, by supplying moisture as well as manure, secures this desideratum.
- 2nd. That it is equally profitable to apply liquefied manure to grass crops.

The proceedings terminated with the customary votes of thanks to the Chairman and the introducer of the subject.

THE DIGGING MACHINE.—An implement under the above designation, invented by Mr. Matthew Gibson, of Newcastle-upon-Tyne, already known to agriculturists as the originator of the Patent Northumberland Clod Crusher, has been daily at work for several weeks past on the farms of Sir Hedworth Williamson, Bart., at Monkwearmouth, and of Mr. Barnes, at Whitburn, near Sunderland. During the past week the powers of this admirable appliance to agricultural tillage have been further tested on the farms of Mr. T. T. Hall, of Ovingham, Tyne-side, Mr. R. W. Swan, of Wallsend, and Sir W. C. Trevelyan, Bart., of Wallington, Northumberland. Its powers, in all the trials referred to, were exhibited on tough clayey soil, and working at a depth of 9 inches, at the rate of three-quarters of an acre per hour, with four horses, throughout the whole day, with no more exertion than that required for ordinary ploughing. The implement consists of a number of cylinders of about three and a-half inches in diameter and six inches long, revolving on a fixed axle. On each of the cylinders is cast a disc, twelve inches in diameter, which is furnished with ten teeth or prongs, of hardened malleable iron or steel, fourteen inches long, of a curved or cat-claw form, springing from its periphery, and which, partly by the weight of the implement, and partly by the strain of draught, is forced into the ground, and, as the implement advances, digs or forces up the soil—in fact, each prong performs precisely the office of a pick or hack in loosening the soil. This forking up or loosening of the soil is not the only important office of the implement, but from the curved form of the teeth it brings all roots and fibrous matter within the depth of its operation to the surface, thus producing a clean as well as a free tillage, or at once acting most effectively as a grubber in bringing up root-weeds, and at the same time performing the most important function of the plough in aerating the soil. The implement is mounted on a strong frame, partly of cast and partly of malleable iron, and furnished with a simple but most ingenious apparatus for regulating the depth of its working in the soil.

BLOOD AS A MANURE.—As Mr. Way observes, "this manure is disregarded." This is true in point of practice, but not so in the knowledge of the scientific farmer; the fact is, we cannot obtain it; it is a most invaluable manure, and we know by the application of blood absorbed by ashes, road scrapings, soot, &c., drilled with turnips and for wheat, the yield of the latter was 40 bushels an acre, and the turnip crops magnificent. If slaughter-houses were provided with large tanks to receive the blood, and ashes, soot, &c., mixed with it, any farmer would be glad to give 10s. a cart-load, if not more, for so valuable a manure, much of which finds its way into our rivers. All gardeners know the value of blood when applied to the roots of the vine. —*Alexander Falconer, Hants.*

IRELAND AND THE LAW OF SETTLEMENT.

It is not always that the hasty withdrawal of a man from those duties he has agreed to perform will either speak to his good sense, or add to his dignity in the eyes of others. Public sympathy, however, has gone very generally with Mr. Baines in the step which he thought it necessary to take. There is no doubt that he was placed in a false and unfair position—himself and his measure compromised without even the common courtesy of his being invited to the consultation upon it. Seldom indeed has any project being more thoroughly identified with him who introduced it, and as rarely has one been treated with more judgment and ability. The abolition of the Law of Settlement was by common consent in Mr. Baines' hands—at least so we might have supposed, until we heard of its being disposed of as if there was no such man in existence.

The deduction which Mr. Baines drew from this was natural enough. He concluded that his friends could do without him, and retired only when he found there was no call for his services in that sphere to which he had so long devoted them. Still, notwithstanding the justice with which he might complain of the manner in which he was passed over, there is no denying that the difficulty in the way was more or less an omission of his own. In an otherwise comprehensive and elaborate plan, the sister kingdom was entirely ignored. We were to legislate precisely as if there were no such people under our care. It has since transpired that Mr. Baines thought Ireland not as yet ripe for any such measure. It is, however, only under force of circumstance that we hear this. If the Irish members had not done what they deemed their duty, we might have been under the further reproach of never having considered their claims at all. Here was the flaw in Mr. Baines's address. There should have been some allusion, at least—some little promise implied of what would be done for Ireland at a more fitting opportunity.

The postponement of the bill has been called a defeat of the Government. From the tone the debate gradually assumed, it may perhaps be so recorded. Few measures, nevertheless, were at first received with less demonstration of party spirit. It was impossible to class its supporters and opponents. They came indiscriminately from all sides of the House, anxious only, as it seemed, to arrive at the real merits of the project. It was but the old war cry of "Justice to Ireland" that drove them back into the customary rank and file. It was then

the point came to be put as a party question; and honourable members who were hand and heart for the alteration as regarded England, voted against it because they had heard of something about Ireland. From the best it came to be about the worst thing ever known; and one respected contemporary gravely warned its agricultural readers, who have been long striving for this abolition of settlement, that it was nothing but one step more towards establishing the Roman Catholic religion in this country. The dog had got a bad name; and it was difficult to say or imagine anything too bad of him.

There is no denying the grave fact that we have to thank Ireland for this. At the same time we must repeat what we have already said on the subject—that it is far too much the fashion to judge of Ireland and the Irish by what they have been, rather than by the test of what they now are, and even further promise to become. The worst days of that country are, we believe, gone by. There is scarcely a person who has visited it, from the political philanthropist to the rigid man of business, but will say the same. The evil of a superabundant dissatisfied population has passed out as gradually as the great wants—capital and its employment—are being introduced.

The invidious distinctions between the two races become less and less to be recognized under the force of that intercommunication which tends so much to mutual advantage. A few years since we will admit that one general poor-law for England and Ireland might have been treated as a monstrosity; in a few years more we are sanguine enough to hope it would be regarded as no such absurdity.

"Twelve years ago," says a practical writer, whose pamphlet* is now opportunely brought out, "for the first time, I travelled over three-fourths of Ireland, principally on foot, and obtained considerable insight into the real character of the people, and the social condition in which they lived. Then it was essential to an immigrant to know their peculiarities, and the circumstances under which they were placed; and this knowledge, if properly used, would have constituted an important element of success; but now, though still important, it is becoming daily of less con-

* "Ireland estimated as a Field for Investment." By Thomas Scott, Land Agent, London. Dedicated, by permission, to the Earl of Clarendon.

sideration, and will soon leave the exercise of the rights of property as free in Ireland as either England or Scotland; so largely are social and political circumstances combining to control and modify internal influences, and to *assimilate*, as it were, the habits of the Irish people to those of the rest of the United Kingdom."

Not very long since, Mr. Bullock Webster gave his experience of the country, in a work known as "Ireland as a Field for Investment." This was evidently the production of a very sanguine man, willing to take everything for the best. His book, indeed, was regarded in many quarters as a puff direct for the Irish property on sale. He now stands corrected by the gentleman we have quoted, who significantly gives his advice and

opinions under the amended title of "Ireland *estimated* as a Field for Investment." With a larger experience of the country to guide him, we should perhaps receive Mr. Scott as the higher authority of the two. It is only fair, however, to say, that while both go over much the same ground, Mr. Webster's fond expectations rarely meet with much discouragement in the pages of his fellow-labourer. They point alike with confidence to the land of promise.

At such a time, we can honestly call the attention of our readers to such a work as that Mr. Scott has just produced. It has, we believe, the full approval of Lord Clarendon and other gentlemen experienced in the people and the country it treats on.

ON THE CULTURE OF LUCERNE.

"Lucerne is a deep-rooting perennial plant, sending up numerous small and tall clover-like shoots, with blue or violet spikes of flowers. It is a native of the south of Europe, and appears to be acclimatised in the warmer parts of England. Lucerne or medic is highly extolled by the Roman writers." . . . "Lucerne is much grown in Persia and Lima, and is mown in both countries all the year round. It is also of unknown antiquity in Old Spain, Italy, and the south of France, and was introduced to England from the latter country, according to Miller, in 1657."

Columella speaks of it, as the choicest of all fodder, and lasting many years; that it may be cut from four to six times annually; that it enriches the land upon which it grows; that it fattens healthy cattle, and is a remedy for sick ones; and that the produce of one rood will keep a horse the whole year.

I cannot admit the full force of the latter remarks; but I know it to be a most valuable "artificial grass," and worthy of the attention of every cultivator; and it has, as a plant, become so hardy, that no great apprehensions need exist as to its successful cultivation on all suitable soils in this country. The soils best adapted to its growth are, I believe, a deep mild loam on a chalky subsoil; but all lands that are well drained and suited to the growth of wheat or turnips will do well for lucerne; they must, however, possess fertility and depth, and the richer the better.

The preparation of the land should be by deep ploughings; it must be brought to perfect culture, and be cleansed from every weed, as these are very detrimental to the young plants. The pulverisation should be complete; and when the soil is rendered as fine as possible, it should be supplied with a heavy

dressing of rich well-fermented dung—this is to be immediately ploughed in, the land rolled down, and all to be finished by the latter end of April or beginning of May.

Seeding.—The seed should at once be drilled in, at the rate of sixteen pounds per acre, at intervals of nine or ten inches. If sown broadcast, about eighteen pounds should be the seeding per acre. Drilling, however, is by far preferable, as offering much greater facilities for cleaning the crop, and other subsequent management.

It is not an uncommon practice to sow lucerne upon a corn crop. This I think very objectionable. It is in its early stages of very tender growth, and requires every attention and advantageous nursing that can be given to it as a crop; but when once it has secured a good hold upon the soil, it is one of the hardiest and most productive of fodder crops. The great desideratum is to procure a good plant in face of its numerous enemies—the fly, slug, beetle, grub, wireworm, and last, though not least, weeds—all are very destructive; and on that account I strongly urge the above course as most likely to secure a good and permanent plant.

Subsequent Management.—This will mainly consist of repeated hand-hoings, forkings, and pickings, together with a periodical supply of rotten dung, to be well forked in. Harrowings are to be deprecated, though constantly practised: it may be a cheap way of tearing up surface weeds; but it also greatly injures the lucerne plants, and of course renders the cuttings less productive. In the third or fourth year after drilling, the crop may be very greatly improved by hoeing up every alternate row: it will by this time have attained sufficient growth and strength of plant to fill up the intervals with its

luxuriant herbage, and may then be more economically cleaned and better cultivated by the horse-hoe and ridge-harrow. The plant will also grow more vigorously, and yield more abundant fodder. As a top-dressing, gypsum stands first, at the rate of three to five cwts. per acre applied when the herbage is growing freely. The saline mixtures come next, and most of the artificials used as manures are beneficial; but being a deeply tap-rooted plant, they are of little value as compared with good farmyard dung put to the roots. Great care is required to keep the crop clean, as it cannot long exist amidst grassy weeds, neither can it bear depasturing any more than a carrot-bed; for if once the head or eye is eaten, the root is almost certain to die. If, however, the crop is well managed, and duly cleaned and manured, it will continue to yield large supplies of very nutritive fodder for ten or twelve years in succession, and the cuttings after the first year may average from three to five, each cutting amounting to from three to five tons of green fodder per acre. It will frequently be ready for the first cutting by the latter end of April; and its growth is sometimes so rapid as to attain one-half inch in height per day, for thirty or forty days together. This, I would observe, is only attained in row culture. On the broadcast system it does not grow with such rapidity: of course its cuttings are less frequent and also less abundant, and its earlier destruction more certain.

I do not know of any domestic animal that does not manifest a decided partiality for fresh cut lucerne. They may be seen weeding it out from other grasses, and eating it with the greatest relish. Horses, cattle, sheep, pigs—all alike do this. For milch cows it is superior to clover in every particular, causing an increase in the quantity and quality of both milk and butter. In this respect it cannot be too highly recommended to cottagers "who keep their cow," a rood of land being sufficient to grow food for one cow; and to all occupiers it must form a very valuable addition to their ordinary supplies of green food: to those in particular who adopt the soiling

system it is almost indispensable, partly on account of its amazing produce, and partly as a wholesome and highly-nutritious change of food. Much has been written relative to its transplantation to produce a crop: it will undoubtedly produce a crop in this way; but it is undesirable, except to fill up old gaps and the like, as the general crop begins to decay; this, however, is of very doubtful efficacy. It may be, and frequently is, sown with an ordinary spring crop, as barley, oats, early peas, flax, buckwheat, &c.; but I have no hesitation in saying, that it is the best, and eventually the most profitable, course to prepare the land, especially for the lucerne crop, and put it in alone. I have named the month of April as the best time for sowing this crop, but it may be deferred so late as August; however, the earlier it is sown in the intermediate months the better: that sown in April would yield one cutting in September, and yet be strong enough in plant to abide the winter. It is seldom grown for a seed crop in this country: this is generally imported, and chiefly from France. I need not observe that most plants die after producing their seed; and although this is not the case to its full extent with lucerne, still it is irretrievably injured by taking the seed crop; hence it should not be taken until the last year it has to stand: it should be once cut, and then allowed to produce its seed, which, when ripe, may be cut and managed in the same way as the clover crop, which mode has been described in my previous papers. It is also seldom cut for a hay crop, for which it is in fact not well adapted, its chief value being for soiling as a green herbage crop. It is sometimes greatly injured by mildew, for which it appears to me there is no preventive or remedy. Caterpillars will attack it in great numbers—in such case, it should be all cut at once, and the land hoed and well raked, or, in such an eventuality, a light harrowing might be allowed, as it is important to destroy these marauders instantly. Stock when feeding upon it are not so liable to colic, or to become hoven, as when feeding upon tares or clover; it is, nevertheless, desirable to cut it a few hours before required for use.

P. F.

PROFITABLE FARM POULTRY.

PROFIT *versus* FANCY.

After much unmerited neglect, poultry have become the fashion, and a man can now pay attention to their proper management, without being called a "henwife."

But although farmers are told on all hands that they have neglected a very profitable part of their stock, they hardly seem to have got many practically useful hints as to the most profitable kinds and most profitable keeping. Most of the essays and books upon the subject are more fitted for the

amateur and fancier, who have plenty to spend, and do not care for profits, than for tenant farmers. Being doubtful upon the subject, I determined to try whether they were profitable, and which were the most useful kinds. I found that they mo t certainly are profitable, and that the black Spanish fowl, upon the whole, was to be preferred.

My objections to the other kinds I will state in order, before going further into the subject. First come the—

Cochin-China fowls. They are difficult to get pure, and the crosses are indifferent eating. They are most voracious eaters, consuming more than their under-sized eggs are worth. It is said that they lay a large quantity of eggs; but I never found the number exceed, or even equal, that of the Spanish hen. The Dorkings are a good kind of fowl, but well-known to be bad layers. Game fowls are inadmissible into the farm-yard, on account of their pugnacious habits. The Dutch and Ham-burgh fowls lay a large number of eggs; but they are small, and the fowls are not to be easily got pure. There are many other kinds of fowls, but I think they are little known but by bird-fanciers and amateurs.

The good points of the Spanish fowl are these:—It is a decidedly handsome bird. It is sufficiently numerous to be easily obtainable. A cross in the breed is easily detected. It is as easily kept as any kind of fowl, and lays a large, well-shaped egg. And when put upon the table, it is not to be surpassed by any for the quantity and delicacy of the flesh. I was glad to find my experience confirmed by Mr. Trotter, in his Essay on Poultry, published in the journal of the Royal Agricultural Society, in which there is the following quotation, from H. D. Richardson's work on domestic fowls. Speaking of the Spanish fowl, he says—"As table birds they hold a place of the first rank, their flesh being particularly white, tender, and juicy, and the skin possessing that beautiful clear white hue, so essentially requisite for birds designed for the consumption of the gourmand." The flavour of their eggs is also very good. They have one great drawback, which is, that they are notoriously bad sitters and nurses; in fact, they can hardly be found in a sitting mood. I shall again refer to this, to suggest a remedy.

Having now stated what I have found to be the most profitable kind of fowl, I will describe what I consider the most profitable management.

As to the number of fowls to be kept upon a farm, I think about 40 or 50 to the 100 acres sufficient: if more are kept, the extra food they require will soon tell upon the profits, except near a town, where the profits are high. The number I have mentioned, if allowed their liberty (except during harvest), will pick up sufficient food to keep them in good condition with but little extra keep. But they should not be left entirely to chance for their food; they should be fed regularly twice a-day. The food I found most profitable was light oats, about a horse-feed to fifty hens. Besides which, I had always a box (made so that they could not get into it with their feet) which was filled every morning with boiled turnips and waste potatoes mixed with oat-dust or bran. With this keep they will lay well, and always be in good condition for the table. In the neighbourhood of a large town, where large prices are to be got, it would perhaps pay to give them extra food, such as inferior or spoilt wheat or rice, &c. I may mention that I kept forty Spanish hens for 15d. a-week, giving them only boiled turnips and potatoes mixed with oat-dust. The profits stood thus:—

	£	s.	d.
40 hens at 15d. a-week	3	5	0
Sold 120 eggs a-week at 6d. a dozen for ten months.....	10	0	0
Profit	£	6	5

We had always sufficient eggs for the house, besides the chickens, which were not sold for want of a market.

In the number of fowls I have mentioned, 40 for 100 acres, there should be four cocks. In addition to these, there ought to be half-a dozen pure Dorking hens to do the hatching part. As nurses they are not surpassed by any breed; and the cross between them and the Spanish fowl is very good. About thirty or forty chickens should be reared, and never more than

100, as the extra feeding of so many chickens becomes a serious business on a farm. The crosses will be first ready for killing, and they should all be killed during the first season; then the extra cocks, and lastly the pullets which are not required to recruit the stock. The old hens should be killed before they are three years old, as after that they are almost worthless. I need not mention the rearing of the chickens, as every good housewife has a way of her own.

With management I have mentioned, the owner of a few dozens of Spanish layers and a few Dorking nurses will always have plenty of eggs to sell, and no scarcity of good chickens.

As to turkeys, I would recommend the Black Norfolk variety, being most easily reared, large, and well flavoured.

Ducks are very profitable, being easily kept, if there are not too many: from six to a dozen is plenty about a farm. The finest kind I know is the White Aylesbury duck.

Geese are also profitable in localities suited to them; but I know little of their habits and management.

Pea-fowls, guinea-fowls, and such like, are troublesome and useless pests about a farm.

But I may state that no kind of fowl will be found profitable, unless they are well cared for. The hen-house should be airy, warm, and as clean as hands can make it.

Now that so much is being said about the food of the labouring classes, it would be well if they were taught that a few good poultry is far more profitable than the little mongrel hens that run about their cottage doors.

I may state, in conclusion, that my opinion in favour of the kinds of poultry I have recommended is founded upon experiment and experience of their good qualities. In fact, after trying various kinds, I have chosen them as the good help of the Vicar of Wakefield chose her gown—"not so much for look as for usefulness and economy." G. E. B.

POULTRY.—At this season we frequently hear our neighbours and others complaining that their fowls do not supply them with the desired quantity of eggs, as they are wont to do in other parts of the year; but we have no difficulty in this matter, for we came to the conclusion long ago, that we ought not to expect them to provide us with eggs unless we gave them plenty of the right kind of food, that they may eat and drink at their pleasure. By experiment we have found that hens fed with wheat and rice, and constantly supplied with fresh water, charcoal, lime, ashes, &c., will produce a larger amount of eggs than those fed on any other grain. Lovers of eggs, and the good things made with them, feed your fowls as above, and you will complain of them no longer.—*American Newspaper.*

THE ARTIFICIAL PROPAGATION OF SALMON.—As several reports have been circulated in the newspapers, to the effect that the attempt to propagate salmon by artificial means in Ireland and elsewhere had extensively failed, we think it right to state that we have obtained some information from the very best sources, which convinces us that these reports are wholly unfounded. On the contrary, we are glad to say the success attending the first attempt at propagation on an extensive scale in this country has surpassed our most sanguine expectations. It is reported from Perth, where about 350,000 ova are nearly hatched, that everything has progressed most satisfactorily; the whole of the ova, with a trifling exception, seem to be in a lively state. The only difficulty appears to be, that of providing sufficient ponds for such a multitude of fishes when they are able to swim, as the feeding ponds already pro-

vided will not contain a tenth of them; and such is the number there appears no other way, after having hatched and protected them for 20 weeks, but that of committing them to the river to take their chance. At Galway, about 260,000 ova are in a similarly prosperous condition. Propagation on a smaller scale has also been carried into effect on the Rivers Tweed, Loughard, the Foyle, Bush Mills, the Blackwater, the Moy, the

Dee, near Chester, and other places. By the use of spring water, which is several degrees warmer in the winter season than river water, the spawn has been entirely protected from injury by frost during the past severe winter; and of 2,500 eggs which were sent from Galway to Basle, a distance of nearly 1,000 miles, M. Lex states that a considerable portion are good, and in a state likely to live.

CORN RENTS.

With markets continually advancing, any one can farm. If, therefore, we should have twenty years of war and of high prices, farmers must be prepared, as we said last month, for a considerable advance of rent. They will have not only the competition for land from their own class, but that from the mushroom crop of farmers which will spring up when farming shall again become such a fortune-making business as it was during the last war. Those who have taken leases at rents based upon the low scale of prices which have prevailed of late years will make money. Let them take care of it, against the revulsion which must follow the return of peace. Those who occupy as yearly tenants, will, in many cases, find their rents advance nearly as rapidly as the price of agricultural produce.

Leases, which are so essential to good cultivation, will be even more exceptional than they are at present. Landlords will be unwilling to bind themselves to a fixed income for a term of years, with the prospect before them of a large increase in the cost of housekeeping; and tenants, with the experience of the past, will be equally reluctant to enter into engagements which political changes may render them unable to fulfil. We can see no better remedy for these impending evils but in the general adoption of corn rents. Corn rents, and wages paid in kind, enabled the farmers of Scotland to weather the storm under which so many of their brethren of the south succumbed. There are not many, however, either among landlords or tenants, who duly appreciate the advantages of paying rent and labour in produce, and thus rendering themselves independent of fluctuations in the value of that produce, from whatever cause it may arise. Corn rents are a novelty, and, like other agricultural novelties, establish themselves but slowly in general practice. Farmers prefer low money rents, with the chance of their being rendered still lower by an advance of prices. Landlords dread the prospect of a fluctuating income. Both parties, therefore, fix their attention on the disadvantages of corn rents, instead of endeavouring to remove them. The disadvantages to the tenant are, that sometimes, in a year of failing crops,

he has a high rent to pay when he has little corn to sell.

But are there no evils in a leasehold tenure at a money rent, based on a high scale of prices? One disadvantage is that during a period of low prices the tenant has no claim for a reduction of rent, even if it has become too high by fifty per cent., and is obliged to accept inadequate eleemosynary returns at the pleasure of the landlord or the caprice of his agent; and those often withheld until payment of rent out of capital has brought him to the brink of ruin. The question is, whether these evils, or those attending a corn rent, are the greatest?

With regard to the manner in which a corn rent affects the landlord, if the inconvenience of a fluctuating income is so great, why, it may be asked, did the clergy cling so pertinaciously to the taking of tithe in kind? With a fluctuating income, it is said, a man cannot know what he may safely spend. We would ask, in reply, what difficulty there can be in limiting himself to the probable minimum, and considering the difference between that and the maximum as a bonus, to be treated as a reserved fund? Again, we would ask, have either the receivers or the payers of tithe under the Commutation Act suffered any inconvenience from the receipt or payment of a rent-charge, reserved in corn and paid in money, according to the average price of corn? Have they suffered inconvenience, at all to be compared with that which landlords endured from money rents rendered inadequate by the rise of prices during the last war, or which tenants endured from money rents rendered exorbitant by low prices on the return of peace? In order to guard both landlord and tenant against sudden and extreme fluctuations, several modifications of corn rents, reserved in produce and paid in money according to some publicly declared average, have been proposed and introduced into practice. We cannot help thinking that of these the principle of the Tithe Commutation is the best—that of reserving the whole rent in corn, but reserving it in wheat, barley, and oats, instead of wheat alone, and making the annual rent

depend on the average, not of one year, but of several.

In our own case we should prefer this to a rent reserved half in corn and half in money, or to the fixing of a maximum and a minimum price at which the corn rent shall be converted into money.

The subject has recently been under discussion at the Probus Farmers' Club, and a resolution passed that "a corn rent, at a fair value for the land, with a maximum of 60s. the quarter, and a minimum of 40s. for wheat, would be advantageous both to landlord and tenant." But why, we would ask, should those prices be selected? Suppose 100 bushels of wheat to be a fair rent for land at the present time, and that during the next twenty years, or the currency of a lease, corn should average 80s., why should the landlord be paid only at the rate of 60s.?

Suppose, on the other hand, it should average only 30s., why should the tenant pay at the rate of 40s.? The object of a corn rent is to bring the rent in fair relation to the average price of the term of years for which the tenancy is to endure. How that may best be accomplished is a question well worthy the serious attention of those interested in land, whether as owners or occupiers; but this fixing of a maximum or a minimum appears calculated to defeat the very object in view, and to be a mere concession to prejudices in favour of money rents, arising from long habit. At all events the scale proposed by the Probus Club is founded too much on a one-sided view of the question. Past experience of prices under war, under peace, and under free trade, indicates the probability of a greater amount of range above 60s., than of depression below 40s.

REDCAR—NORTH YORKSHIRE—HARBOUR OF REFUGE.

If there be one subject more than another which ought to engage the attention, the interest, the justice, and the humane feelings of the Government, Legislature, and the people of England, it is the establishment of harbours of refuge at such places as are fit for the purpose, and where they can be constructed at an expense within the means of a wealthy nation like this. A more appalling list cannot be published—not even those of battles by land or sea—than those which annually record the vast numbers of valuable lives, and the incalculable amount of property lost off our coast; a large portion of the loss of both of which may be justly attributed to the want of a sufficient number of harbours of refuge.

There is no fitter place in the whole circumference of England—a place pointed out by nature herself—for a harbour of this kind, than Redcar; a town rapidly rising into importance, through the discovery of rich mines of ironstone in the Cleveland hills, close at hand. At Eston these mines are in the hands of the enterprising firm of Messrs. Bolckton and Vaughan, where they employ six hundred hands; part of the ironstone is taken to Middlesborough, where blasting furnaces have recently been built by the same firm, in connection with their other extensive iron works. In this town the process of manufacturing earthenware is also carried on extensively by the well-known firm of Messrs. Isaac, Wilson, and Co.; and an agricultural school has been founded at Ayton, by Thomas Richardson, Esq., a member of the Society of Friends. Mrs. Newcomen's—of Kirkleatham Hall—estate is situated about two miles from Redcar, where this pious and benevolent lady, who is universally respected and beloved, has built, at her own expense, a beautiful church, erected by a celebrated metropolitan architect, who is about to build a splendid crescent, with an hotel at one end and public hot and cold baths at the other, close to Redcar, which is becoming one of the most fashionable watering places in the North of England. Mrs. Newcomen has, it is understood, determined to expend all the income she receives as tolls on the ironstone, which is drawn through the Kirkleatham Estate, in improvements in this locality. The tolls amount to £2,000 and upwards a year on *one penny* a ton on the ironstone in its calcined state.

Redcar possesses high claims on national attention. About eight or ten years ago, Mr. Pease, then M.P. for South Dur-

ham, brought the project of making a harbour of refuge here before Parliament. It was favourably received. The cost was estimated at about £300,000, of which it was said Mr. Pease offered to take one-half of the outlay upon himself. There is no place in the United Kingdom where a harbour of refuge is more *necessary*—

1st. From the loss of shipping off this coast, engaged in that nursery of our seamen—the coal trade. In the Redcar harbour ships could always find safety.

2nd. For the defence of the whole coast, and as a place where a fleet might always be stationed. At present, a squadron of ships from Russia might land troops at *low water* at Redcar, who might do great mischief at Middlesborough, Darlington, Stockton-on-Tees, Durham, or Newcastle-on-Tyne, &c.

In point of health, Redcar possesses a fine, bracing air. The sands on the shore are unequalled for firmness and extent. The climate is mild, and the atmosphere pure, as it is visited by breezes from the sea, and from the Cleveland hills, both of which, in the hot summer months, have been found highly beneficial to invalids.

Redcar, at present indeed, is not without its drawbacks. It is badly drained, the water is very bad, and there are no gas-lights. All these disadvantages might, and no doubt will, be remedied in time.

Nearly the whole of Redcar belongs to the Earl of Zetland, who resides at Upleatham, near Guisborough, where his lordship has a model farm in a high state of cultivation. It is managed with great skill and judgment for the benefit of his tenants, and which reflects the highest credit upon his lordship, who has also offered to bring to Redcar an abundant supply of pure water from a spring a few miles distant, if the inhabitants would pay a very trifling sum per house for the supply; but this liberal offer was rejected by a great majority of the inhabitants, which has cooled his lordship's zeal to benefit the town.

Grace Carter, a niece of the celebrated circumnavigator, Captain James Cooke, resides at Redcar with her daughter, who married a "brawny, sunburnt fisherman." The fishermen of Redcar are a fine set of men, and well provided for.

A railway from Middlesborough to Redcar was opened in June, 1846.

AMERICAN BUTTER MAKING.

The following good practical directions for the management of milk-rooms, and for the manufacture of butter on a moderate scale, we copy from the article furnished to the Wisconsin Agricultural Society, by Allen W. Dodge, of Hamilton, Mass., and which embraces the best modes as practised in New England:—

Before the milk is taken to the milk-room, it should be cooled. To effect this object, it is usual to let it stand in some cool place, in the pails. In some large dairies however, it is strained into a large vat, which does not stand in the milk-room; and when considerably cooled, is drawn off into pans, which are set in their appropriate place. If milk, warm from the cows, is taken in large quantities to the milk-room, it imparts to it a higher temperature than is suitable for the keeping of the milk till all the cream rises. The pans—those used in this region are now always of tin, though formerly earthen ones were common—should not be filled more than half or two-thirds full; the hotter the weather, the less milk should be in a pan, as it will cool the quicker. The milk should stand in these pans, carefully arranged on shelves, until all the cream is risen, when it is skimmed. The time varies according to the weather; from thirty-six to forty-eight hours may be taken as the usual period, with our best butter-makers. In the hottest weather, the milk sours before all the cream is risen. As soon as it is discovered that the milk is soured, the cream should be skimmed off, as it is injured by remaining in contact with it. As little milk as possible should be taken off with it, in the process. By some experienced persons, it is thought this souring of the milk is decidedly injurious to the quality of the butter; but in the hottest of the weather it is extremely difficult, in the milk-rooms that are common in New England, to keep milk so as to prevent its souring before the cream rises. When skimmed, the cream is kept in stone or earthen pots, in a cool place, till it is churned—care being taken to stir it daily, to prevent its moulding and acquiring an unpleasant flavour.

Now as to the milk-room—where shall it be, above or below ground? This is a highly important question, and perhaps the quantity and quality of the butter made on a farm depend more on the proper location and construction of the milk-room, than upon any thing else. In the neighbourhood of Philadelphia, the very best butter region in all the country, spring houses are the

most approved. The floor of these is of brick or stone, and the water is admitted at one end, and flows over it, so as to keep the pans immersed two or three inches, and passes off at the other side, the depth being governed by a gate through which the water has its outlet. This, in hot weather, must be an excellent arrangement. But as suitable springs are not always conveniently situated for this purpose, and as butter-making comprises only a part, and generally but a small part, of the farm operations in New England, it is usual here to build a milk-room on the north side of the cellar, flagging it with stones or brick, and carefully pointing the walls with mortar, so as to keep out all vermin. Shelves are placed around this room for the pans, and in the hottest weather the pans are placed on the floor, as being cooler than the shelves. Some persons make a practice of dashing cold water occasionally on the floor, to cool the room—a worse practice could not, perhaps, be devised. The water leaves a moisture, which is extremely detrimental to the quality of the butter. In fact, the dampness which is generated in all cellars and under-ground vaults greatly impairs the value of such places for milk to be churned into butter: what is gained in coolness, is overbalanced by dampness. The butter acquires a flavour—a taint—that no after-skill in management can change or destroy.

In this conviction, it is now the practice of some of our best butter-makers to keep their milk above ground. For this purpose, a suitable room is provided in the shadiest and coolest part of the house—one, into which hot air has but little access, either by the rays of the sun, or by passage ways leading out of doors. A window on the north side, let down at the top during the night, will afford sufficient ventilation and serve to cool the room. It should, however, be covered with gauze or wire-screening, to keep out insects. In such a room, milk may be kept without souring till the cream rises, the most of the summer. In extremely hot weather, resort may be had to the cellar as the safest place, under the circumstances. From a fair trial of both ways of keeping milk, I have no hesitation in giving it as my opinion that a cool room above ground is decidedly preferable to one in the cellar, and that every reasonable effort should be made to provide such a room, and to make it cool by shady trees and other means, where it is desired to have sweet and luscious butter. I have no doubt that by the exercise of inge-

nunity, a house impenetrable to heat might be built, and at small expense, somewhat after the fashion of our modern ice-houses, that in the hottest weather would keep milk sweet till the cream has all risen. These houses are made with double sides, about a foot apart, and the space between is filled in with dry tan—a non-conductor of heat; the roof is left with a space aloft for ventilation, while a double door precludes the admission of much hot air, on entrance to the house.

In the milk-room the greatest cleanliness is indispensable. It being a cool place, sometimes it happens that other articles besides milk, cream, and butter, are deposited in it for safe keeping. But this is ruinous economy. Flesh and fish may keep there; but they taint the atmosphere, and leave a real sting behind, as the consumers of butter, to their sorrow, sometimes find. A milk-room should be used only for its legitimate purposes, and not made into an omnium-gatherum. So, too the utmost neatness should be used in all the management of the dairy—carefully clean and scald the pans, the pails, the jars, and scrub off all drippings of milk from shelves and floor in the milk-room. A drop of milk in a few days grows rancid, and communicates its effluvia to the whole room. But it would be difficult to enumerate all the ways in which the dairy-maid should exercise cleanliness; suffice it to say, that if she has not a love of neatness, either innate or acquired—a pride in having every thing clean and nice, and in being herself the pattern of neatness, she has not the proper qualification for her duty, she has mistaken her calling, and the sooner she retires from it, unless she turn over an entirely new leaf, the better for her, and the cream and the butter that pass through her hands.

In the large dairies of New York, the milk is churned without being set for the cream to rise. The advantages of this practice I am unable to treat of, as it does not prevail in this section of the country. Cream only is churned here. The sour milk is fed out to swine, and for weaned pigs no better article of food can be used. In a dairy of ten or twelve cows, it is more usual to churn but once a week—though some farmers churn twice. In hot weather, it is a great object to have the butter come hard, as it can be more conveniently managed, and is actually better, than when it comes soft. The cream, therefore, must be well cooled before churning. It is sometimes placed in vaults dug in the cellar, and sometimes lowered in cans into the well. If the cream is not cooled, it is next to impossible, in very warm weather, to make the butter come hard, by the use either of ice or cold water in the churn or around it. The therinometer churn, which is so constructed that

cold water may be kept between the two sides of the churn, is but a partial remedy for the evil. The water will be more likely to become warm, than the cream to become cold. Still, if the cream is first cooled, the cold water operates to keep it cool.

As to the varieties of churns, there are as many almost as of ploughs. Many of them, and both of them, are mere innovations, and not improvements. In churns, there are two principles—the crank and the dash, which makes the principal difference in them. Each of these has its advocates; though the crank seems, in New England at least, to have superseded the dash churn. All things considered, it may be doubted whether there is any better churn than the old-fashioned barrel churn. The slats on the arms, however, should always be flat, and not round, as the former offer more resistance to the cream, and create a greater agitation of it than the latter. Where the dash churn is used, its operation may be facilitated by attaching the handle with a string to an elastic pole, inserted horizontally to the walls above, so as to operate as a lever in raising the dash. Whatever description of churn is used, it should be such as will admit of the butter being easily taken from it, and also of its being easily and effectually cleansed after using. Here, as in every part of the process, neatness is the cardinal virtue.

When the butter is taken from the churn, it is worked, salted, and set in the milk-room for a day, when it is again worked over, so as to get out all the buttermilk, and, with us, put up in pound lumps for market. Some people practise washing the butter in cold water before taking it from the churn; but the more general belief is, that water injures the flavour of the butter, and impairs its keeping properties. The usual method of working the butter here, is with the hands—hands which must be clean and cool. The contrivances of brakes, and other butter-workers, have not yet gained much favour with our dairy-maids; if our dairies were larger, the necessity of the case might compel their introduction. The quantity of salt used is about an ounce to the pound; though the quantity is not in general regulated by weight, but by the judgment of the dairy-maid. Butter, when it comes soft, requires the use of more salt than that which is hard, as it will work out with the buttermilk. There are so many tastes in the community that it is no easy task to salt butter so as to suit all. The great point is to salt it enough to have it keep, without salting so much as to injure its flavour. Purchasers of butter are rather averse to buying too much salt in their butter.

Butter that is packed down for future consump-

tion, or for sale, requires a different management. It requires more salt—and to ensure its better keeping, a little pulverized loaf sugar and saltpetre are sometimes added to the salt. It is usually put down in jars or tubs, and in layers, between which is a sprinkling of salt. The butter should be packed snugly in the firkin or jar, covered with a cloth, and then with the proper cover of the vessel. It should be kept in a dry and cool place. If it be kept in the cellar, it may be elevated a little from the floor by pieces of wood, to prevent its imbibing the moisture, and, consequently, the taint of the floor. There are but few cellars that will keep butter well through the summer. In the vicinity of a market it is best to sell it as it is manufactured, and not incur the hazard of damage by keeping it

on hand. Still it must often happen that no immediate sale can be effected, and then the judgment and experience will be called into exercise, to preserve the butter from spoiling. As I have little or no experience myself, on this point, I forbear to offer advice lest I might mislead unintentionally those who might follow it. One thing only I will observe—that no matter how well the butter is made in other respects, if buttermilk is left in it, there is always a liability to become rancid and offensive. Salting will not prevent its spoiling, unless it is made so salt as to be scarcely eatable; nor will all the care you may use in packing and storing, keep it from that deterioration which is sure to arise from the latent buttermilk.—*Country Gentleman.*

CLAY LANDS AND LOAMY SOILS.

It was the grand point of Napoleon's strategy by which he wholly re-cast the art of war, and terrified the astounded world, to accumulate on every single point of contention a force that was very considerably superior to the resistance that was opposed to him; by which he dissipated the force of the other side, and, in his own words, "robbed the enemy of the victory." The very methodical and correctly arranged proceedings of that gigantic tradesman—his rapidity of decision, quickness and energy in action, have never been equalled since the profession in which he was engaged has been practised by the human race; and when joined with the very powerful reserves that were always at hand to restore any reverse and supply the casualties, and the never losing sight, but a constant view, of the main object or ultimate result, in disregard of the quantity of means that was used for the attainment, formed a mass of performances that exceeds the bounds of history, and from which a most valuable lesson may be drawn for many of the useful purposes of life. The parts that apply to our present notice are, a superior force applied to every point, to dissipate the resistance, so that it never again assembles and constitutes an opposition; the aiming at the ultimate result, which must be estimated by the best approximation of its value, and placed against the means that are required; and the keeping of a reserve, with which to repair disasters, and restore the interrupted progress of action.

No adequate force has yet been assembled to vanquish the resistances that occur to the practice of farming; the capital of the cultivator is not able to overcome them, and they continue to exist and present a constant annoyance. The land is ploughed

over in the usual way, the common returns are obtained, and no valuable result is reached. The landowner is no better situated; he expends the whole of his capital in the purchase of land, and no funds remain to improve it; the proper security is withheld, to induce other persons to embark in its cultivation, and the just value is not obtained. The owner is unable or unwilling to put the property into the condition from which a high value can be expected; and at the present time this preparation is indispensable, as without the proper furnishing of the land, the farmer cannot use his capital in the full benefit. This is the present condition of things; a high value of land is expected in rent, and the condition of the property will not afford it. Hence the necessity of bringing a superior force to bear upon the resistances, dissipate the opposition, and obtain the result.

The reserve fund of every purchase of land, or of farming, should be one-fourth, or rather one-third of the whole amount, and remain in readiness to support any casualty or weak point, and to further any apparent success. Many and great losses have accrued from the want of this reserve; without it, undertakings are not safe, but hang upon the breath of the chance and accident of the first attempt. If repulsed, the project generally falls to the ground, or a languid existence is prolonged, which is both useless and profitless.

The writer of this notice has proposed that all clay lands be changed into loams, by being dug and mixed with hot cinders of lime; and that all lands whatever be mixed with lime in that way, by which to deepen and improve the staple. The caloric evolved by the dissolution of the cinders in clay soils will penetrate the aluminous mass,

sunder the particles, and dissolve the adhesion, so that the soil does not again resume the pristine condition, and become clay. It will subside into a fertile soil of mucilaginous ingredients and earthy particles, from the lime and clay. To effect this purpose, one bushel of cinders will be required to a cubic yard of the dug soil, which, with the expense of spade digging, may cost about £30 an acre. It is not certain, but experience will determine, if one bushel of lime be sufficiently powerful to penetrate and divide a cubic yard of clay soil, so that it does not again become clay; if not, more cinders must be allowed, or the purpose is useless, if adhesion again takes place, and clay is formed. The resistance must be completely dissipated by the application of a superior force, as by the above-mentioned maxim.

The expense of £30 an acre is not to be heeded, but the ultimate result ascertained as accurately as possible. Clay is much the best basis of any soil, as is evinced in the case of clayey loams. The proper quantity of it is the grand desideratum. Clay and lime, in compost, form a very good top-dressing for grass lands, provided the lime be in a superior quantity, and able to overcome the repulsive quality of the clay. Hence it is inferred

that a rich soil may be formed by mixing the two bodies in a permanent situation. The marine clays of England are worth little, and are most difficult of cultivation; the plastic, London, and gault clays, are best used in grass, where top-dressing can be found; the lias, clunch, kimmeridge, and wealden clays, are very inferior soils, except where mixed with the debris of the chalk, as in the rich vale of Aylesbury. It is presumed that all these clays would be tripled or quadrupled in value, by the mixing with lime cinders, so that £30 would be repaid in the course of from 20 to 30 years, which is not a long term for accomplishing such a valuable result.

Such a purpose as now mentioned falls upon the landowner, or the government loans of money, and is wholly beyond the province of the farmer, unless upon long leases, as are granted for the building of houses. This extension has not yet reached the agricultural world, though equal benefits would follow.

The above subject is very fully discussed by the writer of this notice, in a late publication, entitled "Clay lands and loamy soils;" price 1s.; Weale, 59, Holborn, London. D.

THE LAW OF SETTLEMENT.

No. V.

"The aim of every enemy of constitutional freedom will always be, that the House of Commons should have every right of the people entirely dependent upon their pleasure."—BURKE.

"Get put into the shape of an ink and paper statute any troublesome rule of common law, in favour of whose practice there is a natural prejudice, taking care in doing this to narrow its application as much as possible;—you will thus be able, on the first convenient season, to deal with it as a mere statute; and to alter, neutralize, or wholly overturn it, as suits your convenience."—COKE'S PARLIAMENTARY SPEECHES.

The recital of this statute (14 Car. ii., c. 12), careless and confused as the terms of the act are, is diffuse in explanation of alleged grounds for its enactment, and we may as well look at a few of them.

"Whereas the necessity, number, and continual increase of the poor—" The statements concerning this necessity are appalling. From Sir Josiah Child, in his "Discourse on Trade," in 1669, I learn that "our poor in England have always been in a most sad and wretched condition." Famished and starved and naked, languishing by whole families in a loathsome and useless condition, he represents them, a burden alike to themselves and to the country. This description is echoed by Thomas Dekker, in his "Greevous Gronces for the Poore," 1622. Writers

of this period are unanimous in representing the miserable condition and urgent need of the poor.

The author of "Trade's Destruction is England's Ruine," one W. C., "A Lover of his Country," gives us in the following sentence some clue to the source of this *necessity*. Though England is large, and much husbandry-work is required, he says that "these men, who have nothing but their labour to subsist on, either by ploughing, threshing, hedging, and such-like country employment, are little better than slaves; let them be never so laborious, their wage is so little that they are never in all their lives able to lay up anything for the subsistence of their families after their death," &c.

In my last letter I stated that the *necessity* we are now discussing arose in part from a temporary cause—the rise in the price of provisions not being followed by increased wages. The old question of wages again meets us, then, and assuredly it is the most important social question of the present day also.

Upon reading the letters of Thomas Ruggles, upon the "Police and Condition of the Poor," who had closely investigated Fleetwood's "Chronicon Pretiosum," and other Monastic ledgers, I find that up to Henry VIII.'s time the wages of the poor (*i. e.*, the freemen) had uniformly borne a very fair propor-

tion to the necessaries of life. Any one referring to Arthur Young's "Annals of Agriculture" may see this to be the case (1). The 3rd Eliz., s. 15, reinforced the regulation of wages between master and servant, payment of labour having respect to times of plenty and scarcity. But when we arrive at the period of the Restoration, wages cease to bear such a fair proportion to the prices of provisions—*i. e.*, to use the words of Master Ruggles, "they would not procure for the labourer such necessaries and comforts of life, equal to the reasonable wants of that class of society among which he ranks."

According to the equitable provisions of the law of supply and demand, which the employers of labour in the time of Richard II. were not more averse than our own capitalists, to swear by, and the more readily when the price of labour was low, wages are in inverse ratio to the number of people in a place.

And now with respect to the *number, and continual increase of the poor*. We find that this *increase* took place in proportion as the means of support diminished!

From the Conquest till the reign of Edward III. England was little troubled with vagrants, beggars, or paupers; but, under the feudal system, the independence and moral dignity of the populace was sapped. Serfs and slaves were taught to make no provision for themselves, but to depend upon their lords. Of course, when this system was broken up, there were beggars in plenty; and we find that begging, from being tolerated, became at length *licensed*, and exalted to the rank of a profession more profitable, as De Foe states, than any industrious vocation (2).

Subsequently we are informed of the poor being taken under the wing of the church. This course tended but to nourish the seeds of that evil already sown; and the foundations made by our forefathers in the spirit of benevolence, or from less worthy motives, with the intention of exorcising poverty, served but to create, to collect, and to sustain it (3). The "doles" often brought large bodies of people into spots unfavourable to the exercise of their industry, merely from the hope of the trifling benefits to be obtained without labour. And if one wishes for an illustration of how far an extensive system of eleemosynary charity may corrupt and paralyze a people,

(1) Vol. 12, p. 421.

(2) 1701: Daniel Defoe writes thus:—"As for the craving poor, I am persuaded that I can do them no wrong when I say, that if they were incorporated, they would be the richest society in the nation; and the reason why so many pretend to want work is, that they can live so well with the pretence of wanting work, they would be mad to leave it and work in earnest. And I affirm of my own knowledge when I have wanted a man for labouring work, and offered 9s. per week to strolling fellows at my door, they have frequently told me to my face, they could get more a-begging."

(3) Sampson Lowe's Charities of London.

one has only to look towards those countries where the papists have used this engine—to Ireland, to Italy, to Spain and Portugal, and in former times to England.

For the performance of this primary duty, as the support of the poor was in those times thought, ample endowment was bestowed by the state upon the clergy. Authors differ as to the manner in which such funds were appropriated and misappropriated. Some maintain that the poor got nothing; some, such as Selden and subsequently Thomas Ruggles, that the alms were but meagre, bearing perhaps some similarity to what they now are in those parts of Normandy which retain their primitive habits; while, of course, their brethren in the faith indignantly reject the impeachment. Henry the Eighth finding the Pope troublesomely inimical to his uxorious desigus, cast about him for means to curb the spiritual power of Rome in England. Did he light the fires of persecution? No; but with superior knowledge he touched the revenues of the church, and thus craftily answered two purposes by one stroke—threw off the yoke of the Pope, and supplied his exhausted coffers. Little as the monks may have done, the immense accession that immediately followed the dissolution of the monasteries, to the number of destitute vagrants, who wandered up and down the country, "seeking whom they might devour" (!) and laid the foundation for that state of things which Elizabeth characterized when she exclaimed, "Pauper ubique jacet!" proved clearly enough that they were not guilty of the total neglect of the poor (4).

Another source of this "*increase*" was the means the great landed proprietors took to reduce their own expenses. On all hands I meet with serious complaints of such procedure; and our modern landlords are not altogether free from blame on this head, as I have already indicated. It is stated that the landlords had driven the poor out of the practice of husbandry, and had thereby positively "bred rogues;" or, in other words, "bred" that very terrible burden of pauperism, from which they appealed to parliament to shelter them.

For the purpose of striking a blow at this growing abuse of privilege, Mr. Francis Bacon stood up in his place in the House of Commons, 1597, and made a motion "against inclosures and depopulation of towns and houses of husbandry and tillage." He inveighs against those "viperous natures" that would "raze towns and depopulate districts for the sake of turning their estates into sheep walks;" and after detailing the mischiefs to the country of such a

(4) Pashley says that 50,000 persons were, by the dissolution of the monasteries, involved in utter ruin.

course, ends by saying, "therefore a strict and vigorous law had need be made against such, who fulfil the proverb, 'Si non posse quod vult, velle tamen quod potest.'" I must also quote from Sir Thomas More's pregnant writings on this subject. He shows how such practices are injurious to the morality of the people, and how, by thrusting the scattered inhabitants of a district suddenly upon any one point, when little or no provision had been made for their accommodation, and upon parishes already overburdened, great poverty and crime are produced. "Banish these evils," he says; "command those who have dispeopled so many acres to rebuild the villages they have destroyed, or to let their lands to those that will do so. Restrain those engrossings of the rich, as had as monopolies. If you find not a remedy for these ills, it is in vain to boast of your severity in punishing theft: which, though it may wear the appearance of justice, is neither just nor salutary. For if you educate your people ill, and corrupt their manners from their infancy, and then punish them for crimes to which they are disposed by education, what is it but to make thieves, and then punish them for being such?"

The necessity and the increase, the causes of which I have very briefly exposed, are referrible in all but one instance to the rapacity of those very parties who projected and carried the Law of Settlement then. The people were first pauperised, and then punished for being paupers.

And besides this, we find that what in the preamble of the statute is called "*the great and exceeding burden of the poor,*" was referrible more to neglect in administering the law that existed, than to defects in the law concerning the settling of the poor. Thos. Ruggles, who, in his "Police and Condition of the Poor," tells more truth than is sometimes palatable to folks in high quarters, says, "Legislators were infected with the very vice against which they cried out so loudly—namely, *indulgence*;" and surely this must have been the case when the little investigation necessary to the exposure of such an evident fallacy is apparently deemed a task of too much trouble. Rhetorical artifice and baseless assertion we of this day know well enough are often found in the preamble of statutes, oft arousing the out-speaking fidelity of a Sibthorp! But here Herod is out-Heroded! To state that the law for settling the poor is *defective*, because the poor *increase* in number and necessity, is to imply that these evils would be diminished by a law of settlement, which would be absurd. I cannot find that the 6th Car. I. (1630) supposes such a power. It lays much stress on the neglect of existing provisions, but is silent as to defects.

The phrase, "*some defect in the law concerning the settling of the poor,*" was, I learn upon consulting proper authorities, designedly deceptively, for no such

law was in existence, applying to classes to be then shackled.

"It might," says one writer on the subject, "be true as far as it related to the poor of London;" but then the concession must be made, that for the purpose of restricting the vagabondage of London, the entire working population of England was put into chains!

The preamble continues—"together with the neglect of the faithful execution of such laws and statutes as have previously been made for the apprehending of rogues and vagabonds, and for the good of the poor [which may be doubted], and for the preventing of the perishing of any poor, for want of such supplies as are necessary;"—a passage that has very cleverly been said to amount to this, that, "for the preventing of the poor, young or old, from perishing of want, any two justices may remove any person likely to be chargeable, coming to inhabit in a tenement of less yearly value than £10."

"May it please your most excellent Majesty that it may be enacted, &c., that whereas, by reason of some defects of the law, poore people are not restrained from going from one parish to another, and therefore doe endeavour to settle themselves in those parishes where there is the best stock, the largest commons or wastes to build cottages, &c., &c."

This allegation seems to be the entire and exclusive justification for the introduction of the law of removal! With respect to these parish stocks—that is, the materials furnished to the poor to be worked up at their own homes (principally, I believe, *hemp*), by the parish officers or the town corporations—there appear to have been very few of them. But allowing good parishes to have been numerous, the lax profusion of such, compared to the stringent parsimony of others, would be sure to have such a result, and would be more fittingly termed *irregularities*, than *defects* of the law. Orderly administration should have been the remedy. The neglect of such administration is, however, nowhere noticed throughout the whole act, although the writers of that period constantly allude to it. It is complained that "*the poor people devour the stock of the parishes, going about from one to another, and so become rogues and vagabonds.*" The neglect of the parishes and their officers has nothing to do with this! They, the poor people, are to blame for the destitution of the poor, and being anxious to settle, are the cause of the wants of other poor people, so that bound down they must be. Bound down they accordingly are; and in sight of the wisdom and benevolence that characterises the legislators of those times, and displayed strikingly in the statute, we do not wonder that the most industrious and worthy of the poor were the most effectually trammelled.

No. VI.

Besides showing in my last letter that the statute we are viewing was drawn up and carried through the two Houses by the landlords of the country, I attempted to prove that it was quite unnecessary, by reason of existing provisions for the police and relief of the poor, contained in the 43rd Eliz. c. 2; which, if properly enforced, were amply sufficient to correct the evils that had followed upon a lax discipline amongst parish authorities.

Clearly this is the strongest argument that can be urged against the enactment of 14 Car. II. c. 12; and it may be well again to give it our passing notice.

Dalton, in his "County Justice," shews that under Elizabeth mendicancy was steadily repressed; that the merely indigent poor were protected from being sent, as vagrants or rogues might be, to any place of settlement; and that the impotent were at once relieved, while the able-bodied were set to work. This statute was commended highly by both writers and statesmen; and King James, in one of his speeches to parliament, says: "Look now to the houses of correction: remember that in the time of Chief-justice Popham there was not a wandering beggar to be found in all Somersetshire, being his native county."

Sir Matthew Hale, in his "Discourse touching Provision for the Poor," shews very evidently the extent to which the neglect of officers between the reign of Elizabeth and Charles II. rendered provisions so highly commended completely nugatory. After observing that the 43rd Elizabeth makes two provisions—one for the impotent poor, unable to work, and another for those poor that are able to work, "in reference to whom it gives power to raise stocks by rating the parishioners and setting the poor to work"—he states clearly enough that there was a defect in the *execution* of the statute: "for let any man look over most of the populous parishes in England: indeed, there are rates made for the relief of the impotent poor, and it may be the same relief is also given *in a narrow measure* unto some others that have great families, and upon this they live miserably, and at best from hand to mouth; and if they cannot get work to make out their livelihood, they and their children set up a trade of begging at last. But it is rare to see any provision of a stock in any parish for the relief of the poor."

So because the unpaid annual officers, under whose care the poor were placed by the statute of Elizabeth, had failed to raise proper funds, and neglected to carry out the parochial organization of labour agreed upon, and because the magistrates were too lazy to see that the officers did their duty, the poor, nay, the whole industrious community were called upon to suffer. The stolid Dogberries of that time were

handy enough in the infliction of the whip, the brand, and any manner of oppressive ignominy upon the poor: of sympathy with, and pity for their sufferings, and anything like a healthy recognition of the right common to all humanity, they knew and cared nothing.

The relief under Elizabeth was direct. Now, any neglect fully to carry out such a system would, of course, produce considerable difference in the burden of pauperism in different counties. Some parishes giving relief in money, without exercising just discrimination, would be more liable to suffer than such as applied "the disagreeable labour test" to all applicants.

The Vagrant Act, passed shortly before Elizabeth's death, acted to admiration while justices were alert, "and left not a rogue in the country;" but when they became, as Lord Coke terms it, *trepid* or *trepidi*, rogues swarmed again.

But there is a similar case more nearly within our reach, to illustrate the effect of neglect. In 1847 and 1848 no part of the country appeared to be exempt from a sudden plague of vagrancy; a plague which, some of the many reports that flocked in to head-quarters at Somerset House say, "could scarcely be exaggerated." And all this was produced by a temporary want of vigilance and discrimination in administering relief—perhaps the *trepid* of Lord Coke. An appeal that was made to the legislature (and the wisdom of abstaining from legislation is known to but few) was wisely overruled by the late Mr. Charles Buller; and firmness and nerve soon restored the disturbed equilibrium.

There was a class of poor folks in the 17th century, called "squatters;" a class more or less predatory and lawless in habit. These squatters are described in the preamble of the statute in question, as endeavouring "to settle themselves in those parishes where there is the best stock kept, the largest commons and wastes to build cottages, and the most woods for them to burn and destroy," passing, like clouds of locusts, from one green parish to another, consuming all within reach, and leaving but barren tracts behind, and "becoming at last rogues and vagabonds" themselves. Now, it was really to curb the attacks of these squatters, of which the landlords stood perhaps in dread, that the 14 Car. II. c. 12 was enacted.

It appears that no evidence is forthcoming in proof of the prevalence of this nuisance—no notice of it in print; and if so general and so serious as to need legislating for, it certainly could not have escaped observation; and, if observed, it would have been mentioned along with matters of much less importance. The proceedings of the lect and manor courts contain no reference to such cases. Some country member, I suppose, became impressed with a few instances of reck-

less spoliation—some lopping of wood or destruction of hedges, possibly—or was jealous of the encroachment of these squatters, and with a view to justify an Act altogether beyond the necessities of the case, introduced a large general accusation into the preamble. The mallet was raised to crush the moth, when the thumb would have done the business more effectually.

And, besides, we have yet to be told that this squatting was an evil to be stopped. In Australia or in Canada the arm of the law might just as well be laid upon the civilizing motions of the bushmen or backwoodsmen who are engaged in clearing the wastes that intervene between inhabited parts of the country. In England such wastes existed—they were, in fact, the impediments to circulation, to the formation of roads, and all sorts of communication. To penetrate and subdue these tracts of woodland and unprofitable country, these squatters employed themselves, and their encroachments, however they may have been regarded by neighbouring towns, prove now to have been for the public benefit; for, in the formerly wild north country of England, many places now of the first magnitude were originally settled in this manner.

In the prevailing desire to repress all vagrancy, these forerunners of civilization were not forgotten by the unknown member of the House of Commons, who so unexpectedly contrived and proposed the statute under review, who had probably felt some personal inconvenience arising from the proximity to his domain of certain bands of lawless squatters. And so for the sin of the few the many suffered punishment, and a principle of legislation was reverted to, which, having received ample trial (14 Eliz., c. 5), had been found injurious, and was rejected long before.

This mistake, wilful or otherwise, was accompanied by another which casts a severe imputation upon the discrimination of the statesmen of those times. Of what use was a law of settlement (which could really be regarded as a Law of Removal only) as a remedy to the “defects in the mode of settling the poor,” provided that *defects* was the proper word to be used? The policy of the measure may be judged of from its effects, and these effects may very well form the subject of my next letter.

No. VII.

Of the policy of this the original law of settlement we may judge from its effects upon the pauperism of the country. If it was, as we have strong reason to suspect, only levelled against the “squatters,” the result showed that the irregularities it was designed to remedy were not curable by such a measure. With regard to the whole body of pauperism also,

it failed signally. The failure in either case cannot be said to arise from indolence, for we are assured that “never was a law left to local administrators which was so immediately, so zealously, so fiercely carried out to its extreme and most pernicious consequences.” Whatever neglect the parish authorities might be chargeable with, in the administration of the humane provisions of the 13rd of Elizabeth, there seems to have been *no neglect* in executing the provisions of 14 Car. II.

That there was *no neglect* is obvious from what Master Ruggles says, under the head of additional expenses created by it on those on whom the rate is levied, arising from costs of law in determining settlements, additional trouble to magistrates, to the gentlemen of the profession much business and many fees. “Settlements,” says he, “occupy now no small portion of the attention of the King’s Bench, and reports of the determinations in that court respecting them are become voluminous, and form a topic of no small consequence in the common-place book of the gentlemen of the long robe.” A quiet hitter this same Ruggles! Lord Mansfield also said, “Armies of counsel were arrayed in the parish cases. To be a sessions lawyer is a qualification to be a chief justice. The best house in the village or town is the parish attorney’s.”

Ruggles, by the following figures, makes it yet more evident that no *neglect* existed. They will answer another purpose also, that of showing us the outrageous cost of the system.

Heads of particular expenses, from the return made under the 26 Geo. III. c. 56, for the years 1783, 1784, 1785:—

Medium Expenses of Overseers in Journeys, Attendance on Magistrates, &c.

	£	s.	d.
England	23,545	0	10
Wales	918	17	8
	<hr/>		
	£24,493	18	6

Medium Expenses of Entertainments at Meetings relative to the Poor.

	£	s.	d.
England	11,329	15	11
Wales	383	4	10
	<hr/>		
	£11,733	0	9

Medium Expenses of Law, Orders, Examinations, and other Proceedings relative to the Poor.

	£	s.	d.
England	53,757	11	0
Wales	2,033	11	6
	<hr/>		
	£55,791	2	6

Medium of Money expended upon Settling the Poor to Work.

	£	s.	d.
England	15,680	14	9
Wales	211	14	1
	<hr/>		
	£15,892	8	10

It is well to notice the comparative expense bestowed upon removals in the three first accounts,

and that bestowed upon the setting the poor to work in the last.

Pauperism, and the burden of it, increased annually, in spite of all the activity of officers; and that this increase was in no way owing to the causes that made it oppressive in 1662 is obvious, for upon reference to the price of wheat at that period, we find that in the average for the twenty-five years subsequent to the passing of the law in question, it is considerably cheaper than in the foregoing twenty-five years. The expenses of clothing, and provisions generally, were also much reduced. Notwithstanding the strict execution of the law, the comparative cheapness of food and clothing, and the abundance of work to be had, which far exceeded the hands to do it, we everywhere find it stated that in the interval between the reign of Charles II. and the end of the seventeenth century the pauperism of England greatly increased.

Samuel Daker, in a pamphlet entitled "Bread for the Poor," printed at Exeter, 1698, says, "that whoever takes the trouble to inspect the poor accounts will discover that the charge of maintaining them is in some places, within sixty years past, increased from 40s. to £40 yearly, and others twice that sum, and mostwheres double within twenty years past, is like to double again in a short time; and, notwithstanding such advance in maintaining the poor, yet the wages they receive is greater than formerly, work more plentiful, and provisions cheaper."

In order to prove his assertion he introduces figures that may be relied upon, which are as follows:—

	£
About the middle of the 17th century the assessment of the poor in the county of Devon was annually about	8,991
In the year 1698 about	38,991
Ditto 1785, by the return of the overseers	85,492
I obtain from another source the following rates for the whole kingdom upon the same dates:—	
	£
About the year 1650 at	188,811
Ditto ditto 1698 at	819,000
Ditto ditto 1785 at	2,184,904

This alarming increase received the attention of John Locke, amongst other celebrities. "The multiplying of the poor, and the increase of the tax for their maintenance," says Locke, in his Report from the Board of Trade to the Lords Justices of the Kingdom, in the year 1696, "is so general an observation and complaint, that it cannot be doubted of. Nor has it been only since the last war that the evil has come upon us: it has been a growing burden on the kingdom these many years; and the two last reigns felt the increase of it as well as the present," which was that of William and Mary. He thus implies pretty strongly that this surprising increase dated from the reign of Charles II.

Experience soon proved the mischiefs of this statute. "The increase of the poor is become a burden to the kingdom," says William III. to the Commons from the throne; and there seems to have been an early admission, in his reign, that some mitigation of the law of settlement and removal was absolutely necessary. The restrictions on the circulation of labour having been found to be undue, several new heads of settlement were introduced, each of which would have the effect of making a forty days' residence, under the conditions defined by the statute, a protection against that very removal which the statute of Charles II. had authorised. Forty days' residence, the serving a parish office for a year, the payment of a tax as a rated tax-payer, and a year's servitude of a person having neither wife nor child, or apprenticeship by indentures, are added to the catalogue of heads of settlement.

From a provision that the forty days' residence should date from the publication of a notice to be delivered to the parish officers, there seems no chance for the working man to have acquired a settlement, except with the full consent of the parish officers.

And again, so early did the hardship on the poor, and the inconvenience to the parishes become evident, arising from the restriction enforced by 14 Car. II. c. 12, on their natural liberty to get their bread where they could best find employment, that in the year 1697 the door was thrown a little wider to them, and the churchwardens were empowered to let out such as they chose to grant certificates to. Persons entering a parish with such a certificate were not deemed removable until they became absolutely chargeable. The provision was contained in the 8 & 9 William III. c. 30, the recital to which statute runs as follows, and is in this place worthy of notice:—"Forasmuch as many poor persons, chargeable to the parish, township, or place where they live, merely for want of work, would in any other place, where sufficient employment is to be had, maintain themselves and families without being burdensome to any parish, township, or place;" but "they are for the most part confined to live in their own parishes, townships, or places, and not permitted to inhabit elsewhere, though their labour is wanted in many other places, where the increase of manufactures would employ more hands."

The remedy is meagre and inadequate, and open to serious objections, I must admit. The boon is within the option of the parish officers to grant or to refuse. Had the certificate been to be delivered on demand, the provision would have been more in keeping with so solemn a recognition of the evil in the recital.

The injustice and impolicy of thus leaving it to the option of a parish officer to imprison a man, as

it were, for life, *volens volens*, convenient or inconvenient, is observed upon by a celebrated writer upon the poor law, namely, Dr. Burn; and was pointed out a century ago by Mr. Hay, a member of the House of Commons, who laboured earnestly to convert an unwilling auditory, and to no avail.

In sight of the tenacious hold some amongst us yet maintain upon the remnants of the feudal system and the skirts of the dark ages, and with the report of the discussion that followed, the other

night, upon Mr. Baines' motion for the second reading of his remedial measure before us, we can scarcely wonder that the legislature of William III.'s time, understanding and avowing the necessity there was of qualifying the practical effect of the statute of Charles II., continued the arbitrary power of removal by parish officers, and adopted not the principle that actual destitution, and a claim on the parish funds, should be made the condition of removal.

F. R. S.

THE BEER-SHOP NUISANCE.

There are some evils so monstrous, so palpable in their effects, and altogether so indefensible, that we gradually tire of denouncing them. At the most, we can but impress a truism with which every one is already too well acquainted, and we thus come to bear with them in a kind of habitual despair—knowing that while all condemn, few essay to reform. The moralist will assure us that many of our ills are fortunately so self-apparent and direct in their consequences, as to ensure their own correction. There would appear, however, to be others without the pale of this action, and that only become the more firmly established, the more their baneful influence is experienced. We bow down before them as we should to the tyrant whose dominion is maintained by injustice and oppression. Have we no patriot with courage enough to dispute their power, and to stay their progress?

We may again invite the attention of our readers to the ravages of one of these monsters, and to the victims which are hourly paid to it in tribute. It is one, as we have already hinted, whose rule is but too clearly felt, and that all alike concur in lamenting. Follow the highest officers of justice, and hear how each in turn will point to the enormities he finds to proceed from the contagion of the country beer-shop. Test, again, the truth of this complaint by the every-day observation of the local magistrate, and mark how strong the confirmation. Ask the gaol chaplain to what haunts he would look as the hot-beds of crime. Prove him, again, by his fellow-labourer, the parish clergyman, and still we hear of the beer-shop as the surest incentive to evil. Bear down, if possible, even more directly on the sufferer himself, and it is yet the same. What has the employer most to fear? When does he lose confidence in those under him, and find his property endangered and his business neglected? The answer is again but an echo of that already given. The labouring man's ruin is charged to the beer-shop; and through him his mily, his master, and eventually the whole public

have to endure the consequences of an evil so long submitted to, and so strangely persisted in.

Never, perhaps, was there more apparent desire to improve the condition of the working man than there is just at present. There certainly never was a better opportunity. Seldom has he enjoyed so good an opening for self-emancipation from many of his worst difficulties. As rarely could we have aided him with less pressure upon ourselves than we might at this time. A variety of circumstances are all tending to place the labourer in a higher position than he has ever yet attained to; let it then be our endeavour to establish him in it. Let us, while leading him onward here, impress upon him the necessity for self-respect, and the value of his moral character. Without these, his comforts will quickly fall away from him, and his greater means tend simply to the gratification of greater excesses. There are many different agents, no doubt, to be employed in arriving at this object. We must ensure him a better home, allow him more liberty for the exercise of his industry, and offer some food for the mind as well as the body. In planning all this, however, let us not forget how fruitless may be the endeavour, with a temptation constantly before him, sedulously engaged in undoing what we may have been doing for him. It is a bitter truth that, hitherto, the poorer classes in this country have been proverbially the least provident, and that, under the influence of any temporary success, few, generally speaking, show so little self-control. It becomes us, then, the more to guard them against any evil they may have to contend with, and to spare them, as much as may be, the hazards of the trial.

A nuisance of this kind is always open to attack; and, often as the ground may have been gone over, we cannot but look with gratitude to those who continue to denounce it. Amongst others to whom our thanks are so due stands Mr. Cotton, who at Cheshamford, but a few days since, brought the

subject once again prominently before the gentlemen of his own county. We shall take leave to ask for his remarks a little more general attention :

“The Chairman said there was a question he had brought forward on several occasions, upon which he felt most strongly. The more he considered the subject the more firmly he was of opinion that the labouring classes of this country had not a fair chance of conducting themselves honestly, and with propriety. He had no hesitation in saying that one of the great temptations to improper conduct (he spoke now as Chairman of the Quarter and Petty Sessions), and one of the great temptations to crime through this country, was those unfortunate beer-houses. The subject was an extremely difficult one. In what way were these beer-houses and the whole question of licensing public-houses to be dealt with? There was a strong feeling in this country and the House of Commons that something must be done to put a check upon the conduct of these beer-houses; and it must be seen that the characters of the persons who keep them must be raised or put under better regulations than at present. He grieved to say that the younger portion of their labouring classes were exposed to serious temptation by parties who assembled at these beer-houses; and that the vast number of offences committed in his neighbourhood (and he suspected he was not singular in this position) arose from vagabonds who assembled at them, and tempted those who otherwise would have been seriously disposed to behave better. Public-houses by the high road, frequented by travellers, were kept by the landlords in some sort of order; but beer-houses were many of them established in out-of-the-way places, not open to observation, and there the worst characters assembled; and he had been told by some of the labouring classes that they could hardly get past beer-houses without being jeered at as milk-sops, and being almost compelled to go in and join the riotous parties there assembled. Another subject of greater importance was that they became lodging-houses of the worst description, and he believed in his own neighbourhood, and in other localities, a great number of them were brothels, where young women of bad characters were placed to tempt to the commission of crime, and idle and dissolute characters, unrestrained by persons of a higher character, offered to the young and inexperienced temptations to vice from which they could not readily be expected to escape.”

Few will be prepared to say that this picture is in any way overcoloured. How many, on the other hand, can answer for its fidelity! The question, after all, appears to us to be, whether it is really worth while troubling ourselves to improve upon the condition of these places. If we can, is not this power, as it is, very much in the hands of the magistrates themselves? Cannot they do something to put a check on the conduct of these houses? Should not they see to the characters of the persons who keep them? And are they not supposed to have the proper regulation of the beer-shops in their keeping? For our own part, we must honestly confess that we have little hopes of the county magistracy being able to do much good here, however well they may be inclined. Nay, more than this, we believe it will be difficult for the Government to define any “better regulations”; and, in a word, that the only effective plan for doing away with the

beer-shop nuisance will be by doing away with the beer-shop itself.

The evil, as we have said, is a point on which all classes are well agreed; and no two more so than the owners and occupiers of the soil. Both have as loudly complained of its effect, although, if we remember rightly, the farmers have advised the bolder remedy. They have urged it again and again as one of the great injuries inflicted by the operation of the malt-tax, and they have distinctly counselled the general abolition of the system. In improving the condition of the working man, let him have free trade in everything—in bread, in beer, and in labour. So far, if they be his rights, he has only a portion of them, and he pleads as the victim of half measures.

We go here, as we always wish to, hand and heart with the farmer—for whole measures. The beer-shop is an evil with which there can be no tampering. Like a bad tooth, the best cure is to have it out, and be tormented no longer. At the same time, we cannot but appreciate the services of those gentlemen who seek to relieve us, and of these we have now more directly to thank the gentlemen of Essex. In doing so, we shall, without in any way committing ourselves to it, offer the resolution at which they arrived, for the consideration of other districts and counties:—

“That the Clerk of the Peace be directed to draw up a statement, to be signed by the Chairman at this Quarter Session, and forwarded to the Secretary of State for the Home department, expressive of the strong conviction of this Court that it continues to receive constant proofs that the beer-houses, under the present law, greatly increase offences through the country; that they tend to demoralize the labouring classes, by collecting together, and more particularly on the Lord's Day, the most idle and dissolute characters in their locality, who, unrestrained by the presence of any person of a higher character or station, offer to the young and inexperienced temptations to vice from which they can hardly be expected to escape.”

BREWERS, LICENSED VICTUALLERS, AND BEER-RETAILERS.—A return to the House of Commons, obtained by Mr. Bass, M.P., is printed, containing an account of the number of persons in each of the several collections in the United Kingdom, licensed as brewers, victuallers, &c., with the quantity of malt consumed in the year ended the 10th October last. In the United Kingdom there are 2,700 brewers—2,470 in England, 133 in Scotland, and 97 in Ireland; and of victuallers there are 91,132, of which there are—61,040 in England, 14,812 in Scotland, and 15,280 in Ireland. Of persons licensed to sell beer to be drunk on the premises, there are 40,913 in England, and 3,226 not to be drunk on the premises. Of persons who brew their own beer, there are 26,292 victuallers, and 13,974 beer-sellers who brew themselves, to be drunk on the premises, and 964 not to be drunk on the premises. The brewers consumed 23,852,078 bushels of malt, the victuallers 8,014,561; the beer-retailers to be drunk on the premises 3,554,824, and not to be drunk on the premises 399,325.

THE THRIFTY FARMER.

The provident and thrifty farmer adopts three rules for regulating his business, which he observes himself and enforces on those around him, viz.: to do everything in the right time, convert everything to its proper use, and put everything in its proper place.

He buys only the improved breeds of cattle, horses, sheep, and swine, and keeps no more than he can keep well, either in summer or winter.

He always drives on his work, and never lets his work drive him.

His animals are never under-fed or over-worked.

His outhouses, wood-shed, poultry-house, pig-pen, waggon-house, spring-house, and corn-crib, are nicely white-washed on the outside, and kept clean and neat within.

He has a tool-house, and a place for every tool in it, which may be wanted for any ordinary farm purposes, such as mending implements, making axe or hoe or fork handles, &c., and also for stowing carefully away such as will not be wanted for another season.

He has sheds around his barnyard, to protect his cattle from the weather, and warm, ventilated stables for his cows and young stock, and also a shed to protect his manure heap.

He has leaves or other refuse vegetable matter to gather with soil from his headlands, convenient to his barn-yard, to compost with his manure heap through the winter.

He does not allow the liquid manure to escape into the nearest stream, a quarter or half a mile from his barn-yard.

His barn, and sheds, and dwellings are all supplied with good spouting.

His fences are always in good order, and materials for repairing or renewal are collected and made during the winter.

His woodshed is supplied with wood cut in August, always one year ahead.

His wife never scolds, because she never has occasion to.

Her cellar and pantry are always supplied with the needful *raw material*, which she works up into a palatable form to fill up vacuum at meal times.

Heavy bread, cold buckwheat cakes, and rancid butter, are novelties which her gude man and the children have heard tell of by some of the neighbours, but have never seen.

He considers it a duty to promote the circulation of agricultural papers, and has saved himself some hundreds of dollars by following their advice.

His crops are always equal, and often better than any in the neighbourhood, and are kept clear of weeds.

He watches the market and sells his crops at the highest prices.

He makes it a rule always to spend a little less than he makes.

Himself and wife are both industrious, the children are brought up in the same way, and are not allowed to shoot the birds, smoke cigars, or chew tobacco.

He buys and sells on the cash principle, and thus saves himself from losses and bad debts.

He has a large fruit orchard, well supplied with every variety of fruit to ripen in succession.

He studies the *theory* as well as the practice of farming, has cleared off the last 100 dollars of mortgage, and is seriously talking of making a bid for his neighbour Sloven's farm, which is up at Sheriff's sale.

He goes to church on the sabbath, minds his religious duties, and brings up his children to do the same, lives respected, and dies regretted, as a useful man and good christian.

THE THRIFTLESS FARMER.

The thriftless farmer provides no shelter for his cattle during the inclemency of the winter; but permits them to stand shivering by the side of a fence, or lie in the snow, as best suits them.

He throws their fodder on the ground, or in the mud, and not unfrequently in the highway; by which a large portion of it, and all the manure, is wasted.

He grazes his meadows in fall and spring, by which they are gradually exhausted and finally ruined.

His fences are old and poor, just such as to let his neighbour's cattle break into his field, and teach his own to be unruly and spoil his crops.

He neglects to keep the manure from around the sills of his barn—if he has one—by which they are prematurely rotted, and his barn destroyed.

He tils, or skins over the surface of his land, until it is exhausted; but never thinks it worth while to manure or clover it. For the first, he has no time, and for the last he "is not able."

He has a place for nothing, and nothing in its place. He consequently wants a hoe or a rake, or a hammer, or an axger, but knows not where to find them, and thus loses much time.

He loiters away stormy days and evenings when he should be repairing his utensils, or improving his mind by reading useful books or newspapers.

He spends much time in town, at the corner of the street, or in the "rum holes," complaining of hard times, and goes home in the evening, "pretty well *tere*."

He has no shed for his fire-wood; consequently his wife is out of humour, and his meals out of season.

He plants a few fruit trees, and his cattle forthwith destroy them. He "has no luck in raising fruit."

One-half the little he raises is destroyed by his own or his neighbours' cattle.

His plough, harrow, and other implements, lie all winter in the field where last used; and just as he is getting in a hurry, the next season, his plough breaks because it was not housed and properly cared for.

Somebody's hogs break in, and destroy his garden, because he had not stopped a hole in the fence, that he had been intending to stop for a week.

He is often in a great hurry, but will stop and talk as long as he can find any one to talk with.

He has, of course, little money; and when he must raise some to pay his taxes, &c., he raises it at a great sacrifice, in some way or other, by paying an enormous shave, by or selling his scanty crop when prices are low.

He is a year behind, instead of being a year a-head of his business—and always will be.

When he pays a debt, it is at the end of an execution; consequently his credit is at a low ebb.

He buys entirely on credit, and merchants and all others with whom he deals charge him twice or thrice the profit they charge prompt paymasters, and are unwilling to sell him goods at any cost. He has to beg and promise, and promise and beg, to get them on any terms. The merchants dread to see his wife come into their stores, and the poor woman feels depressed and degraded.

The smoke begins to come out of his chimney late of a winter's morning, while his cattle are suffering for their morning's feed.

Manure lies in heaps in his stable; his horses are rough and uncurried, and his harness trod under their feet.

His bars and gates are broken, his buildings unpainted, and the boards and shingles falling off—he has no time to replace them—the glass is out of the windows, and the holes stopped with rags and old hats.

He is a great borrower of his thrifty neighbour's implements, but never returns the borrowed article, and when it is sent for, it can't be found.

He is, in person, a great sloven, and never attends public worship; or if he does occasionally do so, he comes sneaking in when the service is half out.

He neglects his accounts, and when his neighbour calls to settle with him has something else to attend to.

Take him all in all, he is a poor farmer, a poor husband, a poor father, a poor neighbour, and a poor Christian.

WARTS ON CATTLE.—Cut them open, and apply blue vitriol in powder. This is said to be a sure cure, and by no means painful. An application of spirits of turpentine is also said to prove effectual.

gently, so as not to bruise the softened corn at the bottom or sides, but only rub off the husk by friction. The wet corn slips about easily at each stroke, and the empty husks are soon brought to the surface and removed by the hand. The quality of the barley when made in this manner is much superior, we were told, to that made in mills, but we never had an opportunity of testing it. The reason of the superiority no doubt arises from the dust being better removed, and the medical, or rather *chemical* qualities of the article when thus manufactured better preserved.

The decortication of barley in a mortar is a very ancient practice, having been in use among the Greeks, and indeed among all the oriental nations, from whom they borrowed much of their machinery of this kind. We doubtless received it from the Celtic families of Asia, between whom and our own islands a general intercourse was kept up by the Druids before the Christian era; and, if our provinces are examined, not a few pig and poultry troughs, &c., will be found to be the *barley mortars* or *mills* of our forefathers. We have met with several interesting examples not so far north as the Highland capital.

"*What is one man's meat is another man's poison,*" and therefore, although it would be imprudent to place implicit reliance on the information we have received as to the superiority of decorticated barley on the old plan over that of the modern, in consequence of the testimony being based on *taste* only, yet, from the intelligence of the parties (setting our own judgment aside), the question is one worthy of the investigation of the Royal Agricultural Societies of England, Ireland, and Scotland. In the latter, for instance, Dr. Anderson would experience little difficulty in getting samples of both, grown in the same field, for chemical analysis. The moistened sample could be decorticated and then dried with as little delay as possible, taking care to give it fair play. Part of each sample could at the same time be ground into meal, and culinary experiments made with both products.

The use of barley meal is of great antiquity. Hippocrates, the father of medicine, "wrote a whole book on the merits of gruel made from barley." Professor Johnston, in his *Catechism of Agricultural Chemistry and Geology* (thirty-second edition, question 337), says, that 100lbs. of rye, barley, or wheaten flour contain about 55lbs. of starch, 10lbs. of gluten, and 2lbs. to 3lbs. of oil;" from which, and the fact that the British people are subject in a high degree to that class of maladies for which it affords relief, there cannot be a doubt but it should be more liberally used, especially among our labouring population, who have not the means of paying long bills and fees to chemists and doctors, as the opposite or present system demands. The advantages of the alimentary method of treatment are beginning to be appreciated by more than poor men, and the improved manufacture and cookery of the products of barley merit the most serious consideration of every one interested. Various preparations and mixtures are now made; one of which, for instance, runs thus:—"Three parts of the best wheaten flour, and one of the best bar-

ley; put in tins lined with paper, and placed in an oven heated to 200° F." Others have more barley flour than wheaten, while some add rice, pea, or lentil flour instead of wheaten. But these, although invaluable to those who can afford to pay from 6s. to 2s. 9d. per lb. for them, are beyond the reach of the labouring man; for we assume that any mixture of this kind may be sold at something less than £7 per sack to him, to say nothing of £38 10s. ! at which rate we are now paying, and not better served than if we had the genuine barley flour. There is, we say, a margin here sufficiently broad for building a very profitable superstructure upon, commencing operations immediately; for it may safely be admitted that the manufacture of an article, superior in every sense to wheaten flour, save for bread alone, and so peculiarly adapted to Britain, where so much wheaten flour is imprudently employed in puddings, &c., and pork consumed by the million, is a promising speculation if cautiously set about—one which must ultimately succeed, however much opposition may be experienced in the outset from a prejudice or existing customs.

Prejudices will be easily disposed of, the moment we obtain properly manufactured barley flour at a sufficiently low price. From constitutional and other causes, the health of the people requires it; and therefore it would be absurd to suppose, in this age of progress, that if the quality and price suit their stomach and purse, they will not use a *small* quantity daily.

So much for the prejudices of the million as to the consumption of an article, so highly and justly commended, from the days of Hippocrates downwards; for what is now offered them is either beyond their reach as to price, or else of a quality unfit for human food. The other obstacles are of a more formidable character, of which the malt-tax is the only one we shall mention at present.

The malt-tax has more to account for than many imagine; and not the least of the dark catalogue is the fact that it causes that portion of the barley crop fit for being manufactured into cooling and nourishing food, to be converted into intoxicating and heating drink. This it does by a high fixed duty on the raw materials (malt and hops), without regard to the quantity and quality of the article manufactured from them! than which nothing could be farther from political science or the welfare of the people. Were we to propose taxing the vineyards of France, without regard to the yield of wine, and not only so, but to tax the good crop and leave the bad untaxed, our neighbours would doubtless do more than think us mad; yet this is just how England treats her own farmers! Were barley taxed according to its intrinsic value, we mean the whole barley crop, good and bad, the obstacle complained of would in some measure be palliated; but such a mode of taxation being impracticable, the obvious course for the Exchequer is to tax the manufactured article, or increase the tax or duty on intoxicating drinks now generally being condemned as injurious to health, and then to repeal the malt tax, so as to liberate that portion of barley now fit for human food. Barley in many of our provinces is difficult to harvest and market, free from damage, and

to tax that portion of it fit for food and it only (?) is, we repeat, highly impolitic.

We are not discussing the malt-tax, our readers will observe, but the propriety of taxing that portion of a crop peculiarly adapted to the wants of the million, by such means as to cause it to be manufactured into an article injurious to health, and the leaving untaxed the other portion of it unfit for food in such a manner as to throw it into the market as food; thus establishing in the mind of an unthinking public the erroneous belief that barley flour is in reality unfit for food! In short, what nature gives the hard-working man for food and medicine, an impolitic system of taxation converts into drink! The public interest surely demands the opposite of this, for it requires the best samples to be consumed as food for man, and the inferior as food for cattle, now suffering from pneumonia and other inflammatory affections of the chest, for which it is so well adapted. Much of the damage sustained is in the shipping, or long storage in granaries. Let any pharmaceutical chemist for instance, familiar with the active principle or medicinal quality of plants, and the difficulty of preserving the same for any length of time, examine what is vended in this vast metropolis as food for man and beast, and report how it tallies with his *Materia Medica*. Let him, on the other hand, visit the stack-yard of the farmer, and he will find that, although injury may have taken place to a certain degree in the harvesting, the barley is yet capable of being malted, mashed, mixed with chaff, and given successfully to live stock, especially dairy cows, and those suffering from inflammatory complaints of the chest: in this case he can prescribe with confidence; but ship the grain to the metropolis, and then were he to foist it on the public as a genuine prescription, the whole medical profession would simultaneously denounce him as a charlatan. There would then be but one voice on the subject—"Exclude such trash from the market." Now, what is the difference between the doctrine of the pharmaceutical chemist, and that of the corn dealer? No doubt the latter must retail what the corn-factor sells, and the factor dispose of his consignments; but this only brings us back to the root of the evil. Why is not light and inferior barley consumed in the most advantageous manner to the country? and why cannot good fresh barley-flour be had in the British capital? Why are the health and happiness of the million sacrificed to prejudices and unprincipled customs and laws, the offspring of times long out of date?

O A T M E A L .

Much more oatmeal is consumed by the inhabitants of the United Kingdom than is generally credited; and the quantity would be greater still but for an unfounded prejudice against it. Over the largest area of Russia, Denmark, Norway, and Sweden, it is considered a luxury by the lower orders, who seldom taste it save about Christmas and other special occasions, and who with an envious eye look up to those who use it daily as having attained to the highest grade of do-

mestic happiness so far as food is concerned, while those of the nobility who use wheaten flour and butcher-meat are considered as having gone beyond the top of the hill, so to speak, descending into all the dangers arising from over-luxurious living. The first class feeling the pinching effects of their own extreme, where the quality of the food consumed contains too little nourishment to support the hardships and toil to which they are exposed, desire what they imagine the happy mean between it and the opposite, where parties have too much food and too little exercise; while the second class, who do occupy this level, are as dissatisfied as themselves, and as anxious to follow the example of their superiors as they are; and while the last is as covetous to command the luxuries of foreign climes as if their position was the most unfortunate of the three. In short, food appears to be subject to the laws (we had nearly said the caprice) of fashion, in a manner analogous to that of clothing—laws from which the British people themselves, with all their boasted freedom, are not entirely exempt, for in not a few of our provinces wheaten bread and butcher-meat are to this day Christmas dainties on many a labourer's table; so that the difference between Britain and Russia as to cooking is only a matter of degree, the former being a step in advance of the latter. To use oatmeal among us betrays (it is thought by some) a degree of poverty, which, according to this epicurean fashion, is not so respectable! Hence they very considerably refrain from exposing their more unfortunate brethren (?) who are thus circumstanced, without reflecting for a moment as to whether or not oatmeal was being used from choice, in preference to wheaten flour. Such writers hastily conclude, for instance, that in this great metropolis oatmeal is only consumed by the lower orders of the Irish, Welsh, and Scotch; which is much farther from the truth than they, and perhaps many of our readers may imagine. This fashionable prejudice against it, however, is happily fast dying away; for the progress of chemistry is establishing the culinary art upon a more solid foundation, cutting everything of this kind up by the roots. Professor Johnston and the late Dr. Pereira deserve the thanks of the public for their labours in this important field. It is not the lowest of the Irish, Welsh, and Scotch, we may remark, who only use oatmeal, but the more intelligent, calculating, and industrious of them; and the more observing of their English companions are beginning to profit by their example, instead of to laugh at it, as was formerly too often the case, while in the middle ranks parties are beginning to think what is best for themselves, instead of blindly following the example of their superiors.

Twelve bushels of good oats will yield a load (280lbs.) of oatmeal (if very fine, more); and three-and-a-fourth such loads is the allowance of a ploughman for twelve months, with about two quarts of new milk daily. Single men seldom consume their allowance of the former, while families require more.

The composition of oats is different from different soils. Those who use oatmeal have from time immemorial been familiar with this fact, judging entirely from the strength of nourishment experienced, meal

from fine rich soils being realized as more strengthening than that from the opposite quality.

The composition of oatmeal is also affected by its manufacture. If it is thrown upon the kiln too thick, and too hasty a fire applied, for instance, "sweating," or burning, is the result, deteriorating the quality. In grinding, again, it should be equally and finely rather than coarsely granulated, being neither reduced to a fine flour like wheat, nor yet left half grits half flour, like much that is sent to the metropolis, and even used at home by parties who know no better. Some families of distinction in the north, who comprehend the philosophy of the thing—if we may so speak—are very particular, both as to the drying and grinding, and when residing in the capital, or at their English seats, get up small quantities per railway, as they require it, of the proper quality from their own millers. Oats are sometimes dried with peat, but more frequently with the husks or "shelling" obtained in their manufacture, each of which gives it a peculiar flavour exclusively appreciated by those accustomed to it. In short, we have always considered it more difficult to make good oatmeal than wheaten flour, more art being required to effect properly the several works of drying—shelling—separating from the meal the "dust," which is very black and nauseous, and which consists of the fine downy substance covering the kernel of meal immediately below the husk—and the effecting of the proper granulation of the meal in the grinding.

Oatmeal should be put in well-seasoned "girnels," or barrels, &c., and, contrary to wheaten flour, rammed as closely together as possible, in which state it will keep for years. New meal, in fact, is not considered thrifty. If left loose for any length of time, it (according to the technical phraseology of some provinces) "winds," *i. e.* is injured by the influence of the atmosphere. However small a quantity of it therefore is kept, it should be closely packed into some tin vessel, earthen jar, barrel, or box, and covered with a floured cloth under a close lid, so as to preserve it sweet.

The difference of the composition of oatmeal and wheaten flour, according to analysis, is not so great as results in cookery indicate—a fact which proves that chemistry has not yet solved some of the most important problems in connection with food. We make this observation, not for the purpose of finding fault, but, on the contrary, to suggest further improvement. In order to illustrate our proposition, we quote the following tabular analysis from Professor Johnston's invaluable new work, "The Chemistry of Common Life." No. III. "The Bread We Eat."

	English fine Wheat Flour.	Bran of English Wheat.	Scotch Oatmeal.	Indian Corn Meal.	Quinoa Flour.*
Water.....	16	13	14	14	16
Gluten.....	19	18	18	12	19
Fat.....	2	6	6	8	5
Starch, &c.....	72	63	62	66	60
	100	100	100	100	100

* Quinoa is a small seed cultivated on the high table lands of Chili and Peru, at elevations where rye and barley refuse to ripen, and supports dense populations. It approaches closely to

Now, the above columns do not exhibit that difference experienced in the cooking of oatmeal from that of the others, so that more extensive investigations require to be made in the laboratory before chemistry can be brought to bear upon some of the nicer questions involved successfully. At the same time, it is obvious that, from the rapid progress this science is making, such will soon be obtained. In the meantime the above table will be found useful, if not sufficient for the generality of culinary purposes. In the case of oatmeal, for instance, it will enable us to form a general idea as to how it is and should be cooked, whether in the shape of bread, puddings, or soups, mixed or otherwise.

Baked into bread, it may either be leavened or unleavened. The latter is that generally used, but the former also frequently. Oatmeal does not leaven well, "owing to a peculiar quality of the gluten which the oat contains," it is said; but, at the same time, we have eaten some very nice loaves too, especially when the dough was made with milk—no doubt because this brings it up nearer to the wheaten-flour standard, by supplying something of which it is deficient. Generally, however, the loaves are baked without milk, and are heavy, not rising well. Reapers, in harvest, have frequently "loaves and milk," or "loaves and table-beer," to dinner, and sometimes breakfast also. For the most part, a fourth or third of wheaten flour is added, which greatly increases the fermenting quality of the bread. Cottagers occasionally add a few potatoes to the dough, which, when made of oatmeal, wheat, and pea flour, with milk, a little pepper, cinnamon, nutmeg, and carraways, makes a favourite family loaf, at times preferred by thrifty dames to the bread of the public bakers. But, after weighing both sides of the question, we have long since come to the conclusion, that more than the half of the leavened loaf should be wheaten flour; and the propriety of mixing oatmeal in our loaf we shall subsequently discuss.

Oat-cakes are kneaded and baked in various ways. Sometimes the "batch," or whole of the dough to be used at one baking, is made with warm or cold water twelve or twenty-four hours before being kneaded into cakes, in other cases only immediately before being used; but the more common plan, and that which produces the best bread, is to make the dough with cold water in small quantities as required, mixing only a sufficiency for one cake at a time, and kneading it out as dry and quickly as possible; and then baking it with equal despatch, so as to have what is termed sweet, dry, and crummy cakes, free from that insipid and boardy toughness and hardness peculiar to them when otherwise done. Oatmeal has an aromatic and saccharine flavour when properly cooked, both in bread and pudding, peculiar to itself—a flavour with which intelligent cooks have long been familiar, from the degree of art required on their part to preserve and develop it properly at table. We have often heard it estimated in the north that there was not one in ten who

oats, according to the above analysis, which, we may observe, is by Vœlcker, and appears to merit more notice than has yet been paid to it.

could bake oat-cakes properly, so special is the art required to preserve in the highest degree the peculiar aroma and sweetness in question. Doubtless some of our readers have experienced the provokingly seeking smoke of "a baking day," which not only fills every corner and cranny of the kitchen, but also of the whole house, the moment the work commences. What is it? Chemistry as yet has returned no satisfactory answer, although the "missus" can tell, long before it is time for her to get out of bed on the morning of such a day, whether the cook is making good or bad bread. All that we do know is this, that it is the smoke of oat-cakes when baking, and that it affects the eyes and nose differently when properly cooked from what it does when otherwise. When oatmeal is thrown into cold water a slight effervescence takes place, proving that a change is being effected owing to the presence of alkaline and acid substances. In mixing the water and meal hastily, in making and kneading the dough, this change is to a certain degree prevented; and we can readily suppose that when exposed to the influence of heat a certain change may take place between the oil, alkaline, acid, and other elements subject to the peculiar *modus operandi* comprised in the general details of kiln-drying and baking, but our limits will not allow us to enter upon so broad a field as such an hypothesis opens up before us. Suffice it to say at present, that the art of making oat-cakes is a very nice one, requiring no small amount of handicraft to perform it properly.

We have just been speaking of "*plain bread*," but our readers will observe that there are also "battered cakes," "sugared cakes," "seed-cakes," "sponge-cakes," &c., in endless variety. Butter does not answer so well, according to our taste at least—as suet, or the fat skimmed from broths and soups, or the dripping of roast meat. Any fat of this kind is melted in the water for making the dough, and incorporated with the meal while hot. The dough is then kneaded into cakes, as formerly, in the case of plain bread. Cakes made in this manner eat very short and nice, and we have sometimes thought more easily digested than plain. Sugar is seldom added, but when done is also melted in the hot or cold water for making the dough. Seeds are frequently used, especially carraways; and they are best to be mixed with the meal prior to making the dough. Soda-cakes are occasionally made, but eggs are seldom used in the making of oaten bread. A few potatoes are frequently mixed by thrifty cottagers' wives, when the bread assumes the name of potato-bread.

Cakes are either baked upon a gridiron over a clear fire, or toasted before it; sometimes they are turned upon the gridiron, but more frequently baked on the under-side only, and then toasted on the upper side before the fire. But the best cakes are those which are toasted on both sides before the fire, or over it on an open slate-bottomed gridiron, being the whitest and best flavoured. At the same time, it may be proper to mention that there is a peculiar method of kneading and turning on the gridiron, which produces a soft but very sweet cake, preferred by some. Cakes, of course, may also be baked in ovens.

Oat-cakes are eaten in the same manner as wheaten bread, only with milk they form a dessert-dish, as it were, on almost all occasions among the labouring classes, unless where tea and coffee are used. After his porridge and milk at breakfast, for instance, the labourer generally, if not always, uses less or more "cakes and milk" also, and not unfrequently the same at dinner and supper.

Much has been said and written against and in favour of oat-cakes as food. In point of economy they have extremely little to recommend them in preference to wheaten bread. A stone of oatmeal when baked, for instance, goes into extremely little bulk, and has no great duration upon the table of a hard-working man—less, we have often thought, than four quarter loaves. At the same time, both are generally to be found on the tables of farmers, and not unfrequently their labourers also, and the former often preferred. Upon the whole, however, leavened bread is gaining ground, more being now consumed than formerly. The more prudent and economical use of oatmeal is in puddings, gruel, and mixing in broths and potages.

Gruel made of oatmeal or groats is probably as much used in the south as the north; and its value is too well known to require special notice. There are probably as many modes of cooking it as there are provinces in the kingdom, owing to the numerous ingredients used for seasoning; besides which, we have several kinds, as "water-gruel," "whey-gruel," "milk-gruel," "ale-gruel," "beef-tea-gruel," &c.

Besides gruels, oatmeal is often used largely in broths, or vegetable-soups, or rather potages. We have seen, for instance, greens cut very small, and boiled for several hours along with a little oatmeal, and a small piece of mutton-suet, or even butter, so as to form a thick mess, which was eaten with cakes, pepper, &c. We have also seen thin hard-baked cakes broken down and used in making broth with beef or mutton, in the same manner as the Bedouin Arabs do with unleavened cakes of millet, lentil, barley, or wheaten flour, and which relished very nice, especially when a few vegetables from the garden were added. Where vegetables contain a large per-centage of those elements of food of which oatmeal is deficient, there cannot be a doubt as to the propriety of its being mixed along with them in potages, and the like; but of this more afterwards.

It has always occurred to us that for bread, gruels, and mixing with soups, &c., oatmeal should be differently manufactured; but here we have no experience. Were oats dried more slowly on the kiln, and ground fine like wheat, we think leavened loaves might be made, with the addition of a very little wheat flour; and our reason for so thinking is the above and other analyses. We wish some of our northern readers would try an experiment. In point of fact, we are here throwing a very responsible duty off our own shoulders upon those of *millers* and *farmers*.

As formerly stated, the most important mode of using oatmeal is in puddings, of which there is an endless variety, arising partly from the different modes of cooking, but principally from the long list of articles

mixed along with it. The whole of them, in the language of cooking wheaten flour, are essentially "batter puddings," as will be seen from the few examples we shall give for the sake of illustration. Their value depends upon their chemical analyses—but of this afterwards. They are divided into two classes, under various provincial generic terms—as "porridge," "pottage," "porritch," "stirabout," "crowdy," &c.; and "brose," "hasty pudding," &c.

"*Porridge*."—When oatmeal is mixed in any boiling liquid, in quantity such as to bring it to the consistency of a pudding, or in any cold liquid, and then brought to the boil, and boiled for a short time, the mixture being properly seasoned with salt, it forms porridge. The difference between porridge and gruel thus lies chiefly in the quantity of oatmeal used to a given quantity of water; and in different provinces there is a considerable dissimilarity in the consistency of porridge itself, it being used "*thick*," as it is termed, in some, "little boiled;" and "*thin*" in others, "greatly boiled."

"*Brose*."—When any boiling liquid is poured on oatmeal, with a sufficiency of salt to season it, and stirred together, the mixture is termed "brose." This may appear to some of our readers "*cookery simple*;" but it is no such thing, for much more art is required to make "brose" than porridge, arising from the greater difficulty of getting the gluten of the meal to coagulate properly, as we shall show under "*Water Brose*."

"*Water Porridge*," or simply "*Porridge*," is composed of water and oatmeal, seasoned with salt, and cooked in various ways, being sometimes mixed together cold, and allowed to stand from 12 to 24 hours prior to being boiled, sometimes the mixture is made immediately before boiling, and sometimes the oatmeal is added slowly to the water while boiling. Each of those modes has its advocates; but the last is the more common of the three, and may, without doubt, be admitted as the best for general use.

Before describing the *modus operandi* of making porridge, it will be necessary to notice, in the first place, the "porridge stick," with which the meal is stirred into the water. This instrument has different names in our provinces, and its size depends upon the quantity to be made; consequently, where porridge is the common or daily fare of labourers, in the kitchens of large farmers, various sizes are necessary, from twelve inches to three feet in length, and from an inch to an inch and a-half in diameter. Small ones should be flattened or made broad at one end, so as the better to mix the meal; and round at the other, for being held in the hand: but where the diameter exceeds an inch, flattening the lower end is unnecessary. Any sort of stick, however, will "stir the porridge," although the above is preferred; and the only difference between the "porridge stick" and "brose stick" is in the size, the latter requiring to be less, and rather sharper at the stirring end, in consequence of the peculiar action with which it is wrought by the cook.

The grand secret of making porridge lies in the coagulation of the gluten of the particles of meal sepa-

rately as they enter the boiling water, so as to have the pudding equally and properly boiled. To accomplish this, the meal should be strewed in as slowly as possible, while the "porridge stick" should be kept going, so as to stir it into the boiling mixture as fast as it reaches its surface, thus preventing what is termed "knotting." If the meal is thrown faster in than its particles are incorporated separately, "knotting" is the result; and the interior of these knots is seldom properly boiled, and often not even coagulated at all, because the coagulation of the outside prevents it. If the boiling is kept up for a sufficient length of time, the whole will be coagulated, of course, and the knots even broken up and equally mixed in the mass; but this requires extra time, labour, and expense of fire—matters of the greatest importance in cottage cookery. Hence the theory of brown-dried and coarsely-ground meal, which we shall subsequently notice.

The proper manner of making porridge is this. The cook, strewing the meal in slowly with one hand, stirs it into the boiling water with the "porridge stick" in the other, taking care to keep up a brisk boil. In order to prevent knotting, and the ebullition from subsiding, the meal, by a rubbing action of the thumb upon the fingers, is showered into the water, as if from a sieve; or, where the quantity of pudding is small, analogous to a gardener sowing small seeds. The experienced cook knows well that if she allows the boiling to cease by putting in the meal too fast, she can never procure so well-flavoured a pudding; and the same result is experienced if knotting takes place. These are cardinal points in practice. When the first handful of meal is mixed, there is a disposition to "boil up;" and the cook's maxim is just to prevent it from doing so, and running over into the fire, by adding slowly the meal. After it acquires a certain thickness, the process of "boiling up" ceases—an indication that there is a sufficiency of meal added, and that if the porridge is now properly boiled, it will be thick enough for the generality of tastes. During the former process, the boiling up, or rather disposition to do so, is accompanied with a soft hissing and scarcely audible noise, with a bubbling appearance around the outsides; while the latter is characterised by a sputtering noise, easily heard at some distance, besides a spitting appearance, small drops of the porridge being thrown up sometimes when the fire is burning very briskly, so that any party without experience (for we are writing to such) will easily know the change which takes place, and consequently when enough meal has been added. Something will depend upon the coarseness of the meal, and the dispatch with which it has been added. If coarse, and mixed quickly, there being a brisk fire, it will be thick enough generally when properly boiled afterwards; but if the meal is fine, and added slowly, a little more may be required. The true index, however, of the quantity of meal to be added to a given quantity of water is the thickness of the pudding itself—a state not very easily defined so as to enable cooks to perform the work without a little experience. A given weight of meal to a given measure of water, although the formal rule in

cookery books, is yet of no use in practice, because boiling water soon diminishes in bulk, while fine meal requires more water than coarse, the latter requiring more boiling; so that we are involving our readers in some very nice questions connected with porridge making—questions no more than properly understood by experienced cooks themselves, at least of the north, for we have there heard it said that “between Maidenkirck and John o’Groat’s few could make their master’s supper, and some *the bridegroom’s porridge never*.” We speak encouragingly for the south, which may yet carry off the palm; but to our text—the thickness of the porridge, which should be such as to pour somewhat freely into a *battered mould*, and jelly or thicken to the consistency of a common batter pudding when cooled to nearly blood heat, at which temperature it should be dished and eaten, as batter puddings generally are, or otherwise with cream or milk as a rice or bread pudding, which is preferable.

“*When is a Potato boiled?*” The same rule is applicable for determining when oatmeal is boiled as when potatoes. When each particle of meal is sufficiently done to the heart, the porridge is boiled—a rule so plain as to require no elucidation. The reduction of the rule to practice, however, is a different thing, especially to parties who have no experience; but a very little of this will suffice to inform any cook when an oatmeal pudding is of an equal consistency throughout, cutting clean and free from a watery and granulated appearance like a well-made batter pudding, only not so tough. It cuts and eats nicer, “in short,” to those who like it.

Fine meal is more easily boiled than coarse, and produces a better pudding, but is more difficult to make; hence the reason why the latter is preferred, generally speaking. Why over the majority of provinces where porridge is used, “*brose-meal*” is preferred to “*porridge-meal*” itself for the making of porridge! Why, in short, common-sense cooking has been led astray so far, that many are not aware that there are two such kinds of meal, or any reason whatever for their being so—cooks who just think that what suits their own easy way is best for the family. The mistake may be pardoned, and the reason why fine meal is more easily boiled than coarse requires no further proof than large and small potatoes. There is, however, a limit to fineness; for when ground into flour like wheat, it is hardly possible to shower it into the boiling water so as to prevent knotting, owing to the particles adhering together; but the more finely and equally granulated it is, if it only runs through the fingers by the assistance of the thumb, as formerly mentioned, so much the better.

When the meal is soaked in water for a night, it not only swells, but acquires a certain degree of acidity; and if for a few days, porridge made of it has the peculiar acid taste of “*flummery*” (Irish) or “*sowens*” (Scotch). The degree of acidity acquired from one night’s soaking is so little as scarcely to be perceptible, unless to those who have some experience in porridge. The pudding eats softer, and on that account may be relished better by some; but it loses the peculiar flavour which charac-

terises well-made oatmeal porridge, as also, we believe, part of its nutritive value, while it requires much more labour and time to make it. Mixing the oatmeal in the water when cold also requires more labour of the cook, it being necessary to stir it not only before it comes to the boil, but longer afterwards ’ere it assumes the proper consistency of a pudding. When mixed cold, oatmeal ground to the finest flour is preferable, and, as will readily be perceived, requires less boiling, and hence less labour and fire, than granulated cooked in the same way, but is more expensive than finely granulated meal in the common way, or mixed in the boiling water.

The Flummery of our oatmeal-consuming districts is a pudding made from the farina of the oat after it has undergone the process of souring, and differs widely from the flummery of some of our English cookery books. It is neither a cheap diet, nor yet a very nourishing one, and as we are endeavouring to produce cheap food for the hard-working man, shall postpone consideration of it for the present.

Oatmeal is sometimes mixed with barley-meal, pea-meal, bean-meal, and wheat-meal; but less frequently than formerly, as it does not improve the pudding. Of late, rice has been strongly recommended; but whole rice, as proposed, does not make a good pudding. We have tried it in various ways, soaked and unsoaked; but it does not answer well, not mixing properly. Rice-meal, however, may be prudently mixed in small quantity, making a lighter pudding, and what we have no doubt would be relished better by families accustomed only to wheat flour. The two meals should be well mixed prior to cooking; and, in proportion, according to the taste of parties. From experiments we have made, one-third rice-meal to two-thirds oatmeal may ultimately be approved of; but half-and-half to commence. Any country miller could grind rice, and the expense would be much less than that of the additional fire and time required to cook whole rice; *so that by employing the miller we have a two-fold gain*.

Porridge is generally eaten with skimmed milk; but sometimes table-beer, treacle, butter, or sauce made of butter or suet, water, and a little flour, boiled together to the consistency of gruel, when milk cannot be had. For several months during winter we have seen farm-labourers have nothing but beer. Burns alludes to this in very forcible terms, when he says—

“Yet humbly kind in time o’ need,
The poor man’s wine;
His wee drap parritch, or his bread,
Thou kitchen’s fine.”

Milk, however, with but very few exceptions, is preferred to beer. Those who prefer the latter are generally those with whose stomachs the former does not agree.

Milk porridge is made by substituting milk generally skimmed for water, and is eaten alone. It requires less meal, but more boiling. Whey porridge is when whey is substituted for water; and “*ale porridge*” when beer is substituted; sugar is occasionally used in each case.

Water-brose.—Put a handful of meal into a bowl, a little salt upon it; then pour boiling water on the salt

in quantity sufficient to make the mess of the consistency of a pudding, stir quickly with a brose-stick, pour a pint of new milk over it, and eat immediately. With single men in "bothies," this is a favourite dish, three times daily, every day of the year; and we have seen them make and eat it within five minutes! Mastication is not required, it is said (?). Indeed, to chew your brose is but another way of saying "Don't like 'em."

Brose-meal requires to be well dried; the oats parched on the kiln, as it were, and coarsely granulated, in order that the boiling-water may be got quickly mixed with it before it cools below a temperature sufficient to coagulate the outsides of the particles. The whole art of brose-making lies in getting the water mixed in this way with the meal in a boiling state; and the poor ploughman who cannot master this (as there are many who never can) is truly to be pitied; for in a "bothie" there is but one choice.

Milk-brose is made by pouring boiling milk upon the meal. Less of the latter is required, and about twice the quantity of the former, than is of water in making "water-brose." The stirring of the boiling milk into the meal is also performed differently, less of it being required, owing to the larger quantity of liquid; and when the two are mixed, a little more boiling milk is poured over them.

Beef or "mutton-brose" is when the liquid in which beef or mutton is boiled is poured on the meal, in the same manner as in milk-brose. The liquid in which turnips and cabbages are boiled makes "turnip-brose" and "cabbage-brose." In the north, a long list of vegetables go under the name of "kail." Hence the old song, the burden of which runs thus—

"O the kail-brose of auld Scotland!"

Sometimes, when no meat is boiled with the "kail,"

butter is put into the brose; but the better plan is, "a joint of beef or leg of mutton in the pot." The brose in such cases is first eaten; then follow the meat and cabbage; and it takes no great amount of chemistry to shew that porridge and milk for breakfast and supper, and "kail-brose for dinner," are capable of making strong men, the "stalwart" heroes of whom our northern bards have long sung.

Our cookery-books, as our readers are aware, contain various recipes for making oatmeal puddings, English, French, and Dutch. One says:—"Pour a quart of boiling milk over a pint of the best fine meal; let it soak all night; next day beat two eggs, and mix a little salt; butter a bason that will just hold it, cover it tight with a floured cloth, and boil it an hour and a-half. Eat it with cold butter and salt."

Another class of puddings is made by mincing suet and onions very fine, and mixing them with oatmeal; adding pepper, salt, &c., to taste. This is sometimes done in a saucepan, and eaten immediately, with vegetables; but more frequently stuffed into the small intestines, cut into lengths of twelve inches or so, and then boiled in a large pot, the two ends being tied: each length forms a pudding. It is termed "white-pudding," to distinguish it from black or "blood-puddings;" and will keep for twelve months, requiring only to be heated on the gridiron before the fire, like a mutton-chop, when to be used. Few farm-houses in the north want a reserve of this kind, and many cottages have the same. The liquid in which puddings of this kind are boiled make "*pudding brose*," when mixed with oatmeal, rather a substantial dish, when puddings break in the boiling, as they sometimes do.

So much for oatmeal puddings, the once homely fare of our peasantry. W. B.

IRISH AGRICULTURAL RETURNS FOR 1853.

From a return just presented to Parliament, and published in anticipation of the usual period, we have an account of the number of acres under each kind of crop (not the produce) in Ireland in 1853. From this return, it appears that the number of acres under cultivation in Ireland, last year, shows a slight decrease, as compared with the year preceding. The following figures are an abstract of the comparison between the two years, as to cereal crops:—

	1852.	1853.
	Acres.	Acres.
Wheat.....	353,566	327,254
Oats.....	2,283,449	2,156,674
Barley, bere, rye, &c.....	339,591	349,017
Total.....	2,976,606	2,832,945
Decrease on cereal crops.....		143,661

The result, however, is different as to green crops:—

	1852.	1853.
	Acres.	Acres.
Potatoes.....	876,532	897,774
Turnips.....	356,790	399,335
Other green crops.....	121,565	120,561

Total..... 1,354,887 1,417,670
Increase on green crops of all kinds.. 62,783

But to the decrease accruing on cereal crops has to be added one of 401 acres on meadows and clover, making the total decrease 144,065 acres; and to the increase on green crops has to be added one of 37,415 acres on flax, making the total increase 100,199; and leaving the balance of decrease 43,867 acres.

The *Belfast Whig*, in noticing these returns, says:—

"From other sources we add the total number of acres under any kind of crop in Ireland, in each year, since 1817, excluding 1848, when the peculiar circumstances of the country prevented the completion of the returns:—

	Acres.	Acres.
1817.....	5,238,575	1851..... 5,858,951
1819.....	5,543,748	1852..... 5,729,214
1850.....	5,758,292	1853..... 5,695,347

"It will thus be seen that though slightly lower than in the three years immediately preceding, the number of acres under cultivation in Ireland was last year below the number in cultivation in 1817 and 1819. These are the things, however, which when taken into consideration, tend materially to reduce or, indeed, altogether remove, the unfavourable inference that might be drawn from a decline, as compared with 1850-52. One is, that the decrease of cultivated acreage has been accom-

panied by an increase in the value of the crops resorted to; that there has been a great increase in potatoes, a crop not only producing more food, but (of late) more price per acre than any other. For various reasons it will be of use to collect the figures showing the number of acres under potatoes in Ireland in each year since 1847 (again, for the reason already stated, omitting 1848):—

	Acres.		Acres.
1847.....	284,116	1851.....	868,501
1849.....	718,608	1852.....	876,532
1850.....	875,857	1853.....	897,774

“If this indicated that our population, having to a great extent escaped from ‘the lazy root’ as their staple food, were again falling back upon it, the results would require to be pronounced unfavourable; but in truth, such of our population as are feeding on potatoes now, and fed upon everything else during the period 1847-49, are not falling back from wheat or barley, but are advancing from the Indian meal of the work-house to potatoes of their own raising. The other fact to be taken into consideration, in looking at the slight decrease of cultivation during the last three years, is the increase in the quantity of stock, and especially in sheep, whose food is principally drawn from land left as natural pasture. Thus the

number of sheep increased by half a million, or one-fifth, in the period between 1847 and 1852, while the average of turnips, almost the only alternative to pasture in the fattening of sheep, very considerably decreased within the same period.

“Leaving untouched, at least in the meanwhile, various inquiries suggested by the returns, we would at present only bring to mind another fact of importance, to a proper understanding of the figures at which we have been taking a glance—the fact that, after all, they refer only to what was sown or cultivated a whole year ago, when circumstances were very different from what they have since become. When the ground was prepared and the seed was sown for the crop of 1853, we were approaching, quite unknown to ourselves, a longer period of low prices; and the high prices which have ruled since last April came too late to have any effect on the agricultural operations of the by-gone year. But the high prices, it is notorious, have had a great effect in extending cultivation this year; and we cannot but think that somebody will be to blame if within a month or so we have not an authentic statement of our present position in that respect, especially as the war, degrading and diminishing our resources of foreign supply, will soon invest the whole subject with a great additional interest.”

ON THE BREEDING AND REARING OF HORSES FOR THE CHASE OR THE CAMP, AS A PROFITABLE OCCUPATION.

SIR,—Various letters have appeared from time to time of late in print, from sporting gentlemen, to advocate the policy of breeding horses for the chase and the camp as profitable; and as I have not seen any reply to any one of them, I venture to trouble you with a few words.

I must premise that I am, and ever have been very partial to horses of every breed, so that I should be sorry to deter any one, who can afford it from breeding horses, and of the best kind; but from the great expense attending this, the heavy expense of rearing them, the many years that must pass before they are serviceable—I except cart-horses—the great difficulty there is in selling them (arising from prejudice either against the owner or the animal, or against all horses in each particular district), I am quite persuaded there is nothing, next to racing and gambling, which a man of moderate means, who aims at profit, ought more cautiously to avoid than breeding and rearing horses.

When I lived in the western division of Suffolk, some few years ago, most of the gentry, who hunted, expected to get a good hunter for a moderate weight, who knew his work, was fresh on his legs, sound, young, and in good hunting condition, for about £30 or £40 at the outside; and the few who gave better prices never encouraged the breed of horses in the neighbourhood by buying of breeders near home, but bought of some noted London horse-dealer at a very extravagant price, and who, rather than the breeder, got the profit.

Here, on the borders of North Devon and Somerset, a horse is even less saleable at £30; and though young, fresh, sound, and in working condition, a would-be-seller here might wait for six months or more for a

purchaser, and think himself fortunate when he found one, rather than sell at a beggarly price at a public auction and a distant town.

To be told for what sums a charger or hunter may be sold, in Yorkshire or Lincolnshire, to a smart cavalry officer or “fast” Melton-man, is no answer to my statement—how unprofitable it is to breed and rear horses generally. I might with equal propriety be told of the sums for which a Derby or St. Leger winner may sell, to some one whose book he does not suit, rather than of the thousands of thorough-bred horses (of the best blood in England) which sell for about £10 to run in a cab.

I will premise that no one need think himself a breeder of horses, who has fewer than two brood mares. And my calculation is that these two are to be kept only with the view of breeding hunters or chargers; that they do no work, be kept in good condition for the sake of the foals; that these last are not to be worked at three year-old to save their keep, but be sold at four years old, untried, fresh, sound, and in good condition (or a man may wait long before he sells, even at £40); that the mares, when bought in, are good, sound, five-years-old mares, half-bred, or three-fourths thorough-bred, and are put to good thorough-bred stallions; and that the breeder continues his fancy of breeding for five years, after which he gets tired perhaps, or begins to think of realizing his profits by a sale, or his executors do for him.

I need hardly add, to your intelligent readers, that if a horse is sold by the breeder, after it has established its reputation in the field, any fancy price which it may fetch is realized rather by the jockey than the breeder.

My figures are below; and though some may cavil with them, I feel convinced that I allow but a small price for the cost of the mares, and a more than average price for foals.

The live stock kept must be bad and profitless indeed if the owner of it may not calculate upon £20 per cent. upon his capital—he running all risks from accident, death, &c., &c.; nor do I think £10, or a little more, too high to consider the annual cost of a mare, or of a colt; and it will be seen that I have put nothing down for farriery, attendance in the paddocks or yards, breaking, castration, &c.

1850 (MAY).		£	s.	d.
Cost of two half-bred brood mares, five years old, £35 each	70	0	0	
Cost of two stallions at £3 3s. each, and 5s. each groom's fee	6	16	0	
Keep of two mares at 2s. per week, from May 1 to September 31	4	8	0	
Keep of two mares at 4s. per week, from September 30 to December 31	5	4	8	
Total ..	£86	3	8	

1851.		£	s.	d.
Keep of two mares at 5s. per week each, from December 31 to April 30	9	1	6	
Cost of two stallions at £3 3s. each, and 5s. each groom's fee	6	16	0	
Keep of two mares and suckers at 3s. per week, from May 1 to Sept 30	6	12	0	
Keep of two mares at 4s. per week, from September 30 to December 31	5	4	0	
Keep of two weanlings at 4s. per week each, from September 30 to December 31	5	4	0	
Total ..	£32	17	6	
Farrier's bill, attendance, &c.				

1852.		£	s.	d.
Keep of two mares at 5s. per week each, from December 31 to April 30	9	1	6	
Keep of two yearling colts, for same period	9	1	6	
Cost of two stallions at £3 3s. each, and 5s. each groom's fee	6	16	0	
Keep of two mares and suckers at 3s. per week, from April 30 to September 30	6	12	0	
Keep of two yearling colts, for same period	6	12	0	
Keep of two mares at 4s. per week each, from September 30 to December 31	5	4	0	
Keep of two yearling colts, for same period	5	4	0	
Keep of two weanlings, for same period	5	4	0	
Total ..	£51	15	0	
Farriery, attendance, castration.				

1853.		£	s.	d.
Keep of two mares at 5s. per week each, from December 31 to April 30	9	1	6	
Keep of two two-year-olds, for same period	9	1	6	
Keep of two yearlings, for same period	9	1	6	
Cost of two stallions at £3 3s. each, and 5s. each groom's fee	6	16	0	
Keep of two mares and suckers at 3s. per week each, from April 30 to September 30	6	12	0	
Keep of two two-year-old colts, for same period	6	12	0	
Keep of two yearlings, for same period	6	12	0	
Keep of two brood mares at 4s. per week each, from September 30 to December 31	5	4	0	
Keep of two two-year-olds, for same period	5	4	0	
Keep of two yearlings, for same period	5	4	0	
Keep of two weanlings, for same period	5	4	0	
Total ..	£74	12	6	
Farriery, attendance, handling, castration.				

1854.		£	s.	d.
Keep of two mares at 5s. per week each, from December 31 to April 30	9	1	6	
Keep of two three-year-old colts, for same period	9	1	6	
Keep of two two-year-old colts, for same period	9	1	6	
Keep of two yearlings, for same period	9	1	6	
Cost of two stallions at £3 3s. each, and 5s. each groom's fee	6	16	0	
Keep of two mares and suckers at 3s. per week each, from April 30 to September 30	6	12	0	
Keep of two three-year-olds, for same period	6	12	0	
Keep of two two-year-olds, for same period	6	12	0	
Keep of two brood mares at 4s. per week each, from September 30 to December 31	5	4	0	
Keep of two three-year-olds, for same period	5	4	0	
Keep of two two-year-olds, for same period	5	4	0	
Keep of two yearlings, for same period	5	4	0	
Keep of two weanlings, for same period	5	4	0	
Total ..	£88	18	0	

1855.		£	s.	d.
Keep of two brood mares, nine years old at 5s. per week each, from December 31 to April 30	9	1	6	
Keep of two four-year-olds at 10s. per week each, for same period	18	3	0	
Keep of two three-year-olds, for same period	9	1	6	
Keep of two two-year-olds, for same period	9	1	6	
Keep of two yearlings, for same period	9	1	6	
Total ..	£54	9	0	

EXPENSES.		RECEIPTS.	
	£	s.	d.
1850	86	8	8
1851	32	17	6
1852	54	15	0
1853	74	12	6
1854	88	18	0
1855	54	9	0
Total ..	£392	0	8
Interest on £70 for four years, at £20 per cent. per ann.	56	0	0
Total ..	£448	0	8
(A) Farriery, attendance, castration, handling, expenses of sale, &c., &c.			
Two brood mares, nine years old	42	0	0
Two four-year-old colts	120	0	0
Two three-year-old colts	90	0	0
Two two-year-old colts	60	0	0
Two one-year-old colts	30	0	0
Total ..	£342	0	0
Deficiency, exclusive of sundries (marked A) not charged	106	10	8
	£448	10	8

If my calculations are, as I think they are, fair, it is of no use trying to induce the farmers of England, who are not sportsmen and wealthy, to breed sporting horses for a profit. This must be left to the nobility and gentry. What farmer can afford to wait five years before he realizes, and then to find he realizes a loss? A sheep (a ewe) may make her return twice a year, in the shape of wool and of a lamb; a bullock, on good marsh land, may double his value in less than six months; and both the ewe and the bullock will do great good to the ground on which it is depastured, and they are always readily saleable; but a fancy horse is very difficult to dispose of, and injures, instead of improving the grass. I want to see it shewn, not merely that there are good stallions from which to breed colts, but that breeding colts is likely to be profitable to the breeder.

I am, sir, your most obedient servant,
Esford, near Minehead, March 7. C. L. B.
 P.S. Since writing the above, I have read in your last

March number a letter signed Cecil (p. 263), wherein he calculates the keep of a colt from October to May. He says:—"To explain myself more clearly, we will suppose two colts are taken from their dams in October; one shall have two feeds of corn *per diem*, a bran-mash once a week, and occasionally a few swedes (according to the state of the bowels), four or five pounds of hay, a small paddock or yard to run into, with a hovel for shelter at night and when the weather is unfavourable." And this he considers to be a well-kept colt. The keep of the other I will not pursue. But will four or five pounds of hay *per diem*, and two feeds of corn (five pounds more), fill the belly of a young growing colt, who has nothing else to depend upon throughout a long, cold, dreary winter? I think not. A hunter that has been once forced into good condition, and which has as much first-rate corn as he can eat, will do on four or five pounds of hay *per diem*, in a warm stable, perhaps; but not so a young growing colt, in a cold paddock or yard. Lower down he speaks of "half-a-hundred weight of hay per week, at £3 per ton," as the quantity—which, I fear, will not even then prove sufficient, though double the quantity first-named; and as to £3 per ton, it is difficult to buy it here under £4 per ton, and then it must be cut, trussed, and carted-in by the purchaser.

"The valuable manure that will be made is equivalent to the extra attendance." Surely, Cecil cannot regard the little heaps of dung in the paddock, as the colt drops them, with such profitable composure! If he has so high an opinion of their enriching qualities, pray let him regard the paddock more closely after the colt has been there a season or two, and say whether the paddock has improved or suffered from the colt's presence there?

Another singular assertion—at least so I think it—though the argument is not a new one, is, that "the produce off the land on the farm ought only to be estimated at the cost of growing it." Pray, why should this not be charged to the colt's account at the same price at which it will sell in the market; especially, too, when in the latter case hard money would be at once handled, and hard ready-money a farmer must find in season and out of season to carry on his farm, or he is lost?

But to return. Cecil calculates the keep of a colt "from October the 15th to May the 13th, at 30 weeks." But why not calculate the cost of keeping him for 52 weeks? The 22 weeks (between five and six months) left out would nearly afford time sufficient, if the pasture on which the colt is to be kept in summer was allotted to a bullock, to get him into good thriving, nay, almost fat condition, to the benefit of the grazier and to the benefit of the land; but is the colt also not to be charged with this, because the sun is bright in summer, and all nature wears a bountiful aspect? I fear, the landlord would not excuse his tenant rent for land, because a colt had been pastured there in the summer. But a horse ought in fairness to be charged high for what he has, because he takes everything on a four, three, two, or one year's credit, on a very bad security, and with the certainty

that if he dies he will leave nothing behind him to pay debts, but his skin.

But to return. If Cecil thinks my few lines worth his notice, I hope he will begin with the first cost of the colt's dam, and of all the subsequent charges his owner incurs for the colt for about four years, without receiving one farthing, and the probable return at that period, as compared with a sheep or bullock; the first cost of which may have been "turned over" more than half-a-dozen times in four years towards payment of rent, taxes, labour, manure, &c., &c., which are ever presenting themselves to the British farmer, and for which a source must be provided, while the breeding of horses is like laying out on a bad mortgage for a long term the money which should be ever at hand to "turn over."

EAST CUMBERLAND AGRICULTURAL SOCIETY.

At the autumn exhibition of the East Cumberland Agricultural Society, Mr. Salkeld, of Holm-hill, offered a premium of £10 to the tenant farmer or occupier of land, in East Cumberland, who should produce the best manure-heap. In awarding the premium, the following objects were to be kept in view:

"The manure-heap to be managed in the most economical manner, so as to produce the largest and best heap of manure at the least cost. The size and quality of the farm to be considered, as well as the expense and quality of the food given to the cattle, and also the expense of constructing the midden-stead."

Mr. Fawcett (of Scaleby-castle), Mr. Wright (of Hanaby), and Mr. Bell (of Highberries), were named by the committee as inspectors to award the premium, and the following is their report:—

"SIR,—According to our instructions, we proceeded on the 24th of March on our duty, with a view of awarding Mr. Salkeld's premium of £10 for the best-managed manure-heap. Mr. Gibbons, of Burnfoot, and Mr. Little, of Watchcross, were the only competitors. We first proceeded to Burnfoot, where we found the making of manure scientifically managed. Mr. Gibbons has got a wall on the south side of his midden, with a tank in the centre, beneath, to catch the surplus liquid. The tank is also fed through covered drains from his stables and byres. A pump is placed in the centre of the tank, by which the liquid is raised, and conveyed in troughs over the upper part of the midden, where it is likely to prove most beneficial. We found in the dung-heap 820 yards of solid manure well saturated with liquid. We also found a considerable quantity loose in the cattle yards among the young cattle, which Mr. Gibbons purposes gathering together and saturating with liquid, so as to improve it for use. And this we estimated to amount to 80 yards of solid manure; which, added to what is already in heap, make a total of 900 yards solid. Mr. Gibbons has given his fat cattle 7 tons of oilcake, and pulled and consumed by his stock generally 43 acres of Swede turnips. And though he did not give us an estimate of his profits, we have no doubt but his stock will prove highly remunerative, so that no mortgage will lie upon the midden. We afterwards visited Watchcross, where we found Mr. Little to have exercised equal economy in the management of his

dung. We found the midden enclosed on three sides by a stone wall nine feet high, which, preserving it from sun and wind, prevents evaporation. We found within this midden-stead 102 yards of solid manure. We found on the lower side of the midden a liquid manure tank, calculated to contain all the surplus liquid running from the midden at ordinary times, besides what usually runs from the byre. From this tank Mr. Little saturates the midden occasionally. He has also an underground drain, beneath his yard and garden, from his manure tank into the front of his dwelling-house, where, after heavy rains, the surplus liquid distributes itself over two grass-fields with obvious benefit. In order that nothing may run to waste, Mr. Little is in the habit of carting waste soil into his yard, and saturating it from the tank, which he finds highly beneficial as a fertilizer for top-dressing. Mr. Little has consumed 2 tons of oilcake and £100 worth of damaged

grain by cattle and pigs. He has also pulled and consumed 5 acres of turnips, so that his manure is of the very best quality. And, from a balance-sheet shown us, the stock consuming the same has proved highly remunerative. Taking all these things into consideration, our impression is that Mr. Little's dung-heap is of richer quality, and obtained at a cheap rate; and, by the rule of proportion, he has a larger quantity to the value of his farm. Under these circumstances we award the premium to Mr. Thomas Little, of Watchcross, as the most deserving. At the same time highly commending Mr. Gibbons's mode of managing his manure.

"JAMES FAWCETT,
"THOMAS WRIGHT,
"WILLIAM BELL.

"To Mr. Donald, Secretary of the East Cumberland Agricultural Society."

EPIDEMICS.—TOWN DRAINAGE AND MANURING THE LAND.—No. II.

SIR,—In my letter which appeared in the *Mark Lane Express* of the 20th ult., I demonstrated that electricity was the bond in matter, the cause of gravitation, and when free produced "cold." I shall now refer to another principle at variance with received notions in science, and proceed to the illustration of their operation in producing what are termed "epidemics."

On reference to chemical works, it will be observed that elementary bodies are divided into two classes, electro-positives and negatives—the former consisting of hydrogen, nitrogen, &c., the latter of oxygen, chlorine, &c.; but the principles of gravitation, referred to above, admit of no other conclusion than that of oxygen, which is of greater "specific gravity" than air, being an electro-positive, and nitrogen, of less specific gravity, an electro-negative, since the former is repelled by the upper regions, and the latter attracted. Oxygen, however, was considered negative, in consequence of its being attracted to the zinc pole of the galvanic battery, which indicates positive electricity; but the savans lost sight of, or were never aware of the fact, that all bodies in a high electrical condition are invariably surrounded by an atmosphere of an immediately opposite electrical state, as the earth, which is intensely "hot" (negative), is surrounded by an equally "cold" (positive) atmosphere: it was, therefore, the atmosphere of the poles of the battery that influenced the electrometer, and unfortunately led the stars astray.

Those who take an interest in this important and truly simple question when not mystified by "science," I beg to refer to my paper (for August, in the *Chemist*, for 1847) "On the constitution of the atmosphere-electrical condition of the elementary bodies"—being one of a series from April to October consecutively; and to the report of a lecture delivered by Professor Faraday, on the 14th of April, 1848, "On the diamagnetic condition of flame and the gases," in which it was said: "All gases are diamagnetic, but not all equally so. Oxygen is the *least* diamagnetic of the gases, and nitrogen one of the *most* diamagnetic. In common with solid bodies, the gases are rendered more diamagnetic by *increase of temperature* (an ascending influence), and *vice versa*." Whether the learned professor thus conveyed diamagnetically a fact so diametrically opposed to all he had ever before taught, as a convenient retreat from a very disagreeable position, or was influenced by any other motive, I must leave for the consideration of others; it suffices for our purpose that oxygen is an electro-positive, and nitrogen an electro-negative.

There is in the shell or solid crust of this globe a certain material known as coal, of which, since the days of Watt, our consumption has progressively increased to the present enormous quantity of about 60,000,000 tons per year, all of which is used as fuel; and by combustion it abstracts from the air 162,000,000 tons of oxygen, which, by combination with the carbon of the coal, forms 222,000,000 tons of carbonic acid: this acid finds its way to the soil, where the vegetable kingdom assimilates the carbon. By this process, then, we have annually added to the surface of the globe 60,000,000 tons of carbon.

The atmosphere is a chemical compound of one of oxygen to four of nitrogen; therefore for the 162,000,000 tons of oxygen abstracted there is about 648,000,000 tons of nitrogen liberated, which, being an electro-negative, ascends to the surrounding or upper regions. By decay, or the decomposition of non-nitrogenised vegetable matter, such as dead leaves, the whole of the hydrogen is converted into a light carburet, the fire-damp of the coal mine, which, like nitrogen, being of less specific gravity than air, also ascends to the upper regions; and by "evaporation," as I shall hereafter show, the gases of water, two volumes of hydrogen to one of oxygen, undergo partial separation, by which they acquire a specific gravity of about half that of air. By these operations there passes to the regions surrounding this globe—

Gases of vapour	} Oxygen	}	Water.
	} Hydrogen		
Carburet of Hydrogen	} Carbon	}	Snow
	} Hydrogen		
Nitrogen	} Nitrogen		
			Cloud.
			Ammonia.

To prove that snow is not congealed or congested vapour, it is merely necessary to mention that it is deposited on the tops of mountains at least a mile and a-half above the point of perpetual frost in tropical climes, a point which vapour ascending from the earth could not pass—that clouds from which rain is falling, or has recently fallen, are invariably black, even by reflected light, whilst from white clouds, which resemble condensed vapour, rain never falls; and if pure snow be compressed into a white jar and thawed, a black ring will be formed on the interior of the jar, whilst filamentous matter will be observed in the water; and that ammonia is invariably contained in both rain and snow-water, evidence of the most incontestible nature has at last been adduced by the scientific world; and this testimony, corroborative as it is of the theory broached in 1844, will enable me to complete the first section of this inquiry.

On such a gigantic question as this, any attempt at nicety of calculation could tend only to mystify. I shall not, therefore, have a strict regard to chemical equivalents, as I have shown above that by the combustion of coal alone in the world there is annually liberated no less than 648,000,000 tons of nitrogen; and if to this we add one-fifth for the hydrogen to form ammonia, it will represent something like 778,000,000 tons. The general use of coal is confined to some large towns, manufacturing districts and machinery; and it may reasonably be assumed that the combustion of wood, peat, turf, oil, &c., decomposes as much air in the year as coal does; then there is the breathing of the animal kingdom, and the ammonia generated by putrefaction, which baffle all attempt at even assumption, but nevertheless convey to the mind some idea of the vastness of this section of nature's operations; whilst the truly-simple manner in which the purity of the atmosphere is preserved may be taken as an assurance that whatever *apparent* evils the operation of fixed principles may induce, a remedy for them is within our reach, and that until this be attained, these evils are attended with corresponding advantages.

Since these principles were made public no other confirmatory evidence has been adduced by the scientific world, than the presence of ammonia in both rain and snow-water; but in the last *Journal* of the Royal Agricultural Society of England will be found an elaborate and highly-interesting paper by P. Pusey, Esq., the President, "On the natural law by which Nitrate of Soda acts as a manure; and on its substitution for Guano," in which are detailed various experiments

which have brought that gentleman to the conclusion that "we may assume, with unhesitating certainty, as a great law of nature, that substances strengthen vegetation mainly by their contents of nitrogen." Whether or not the results obtained justify such a conclusion, and to what extent, time and mature reflection will decide; but it appears that rain-water collected at his residence, which is remote from any large town except Oxford, from which the wind did not blow when the shower took place, yielded, on the analysis of Professor Way, no less a quantity than would represent, on an annual fall of 28 inches of rain, of ammonia 28.59 lbs. and of nitric acid 68.91 lbs., making together 97.50 lbs. of fertilizing manure, and containing 41.42 lbs. of nitrogen, to every acre of land; although the premises on which this calculation is based appear very questionable, and undoubtedly demand further investigation as regards the nitric acid, the cause of the formation of which I shall treat of in my next letter. It does not come from the clouds, as Mr. Pusey supposes.

This then completes the first section of the inquiry. That the potato blight has made its appearance since the days of Watt is unquestionable; and that my crops have been free from blight, whilst those of my neighbours were rotten, is equally well authenticated; I will therefore merely now refer to my two letters under "Decay in Organic Nature," in your journal of the 5th and 19th December last.

FRANKLIN COXWORTHY,
Author of "Electrical Condition."

Maresfield, Sussex, 3rd April, 1854.

THE MANGOLD WURZEL, OR FIELD BEET.

BY P. DEANE.

DERIVATION AND USE.—The mangold wurzel, so called from the German, is sometimes known by the name of the "root of scarcity," but with us it might as well be called that which it really is, viz., the field beet (*beta vulgaris*), from *beta*, a Celtic word, which signifies red, in allusion to the red colour of the roots (*vulgaris*, common). This interesting plant belongs to the natural order of *Chenopodiæ*, or Goose-foot tribe, many species of which are known to the farmer as the commonest of weeds, while others are cultivated for their roots and leaves. The *Chenopodium quinoa* is a necessary article of food in Peru. The *beta cicla* is used on the continent as spinach, the leaves of which are boiled in many parts, and make a choice dish when enriched with a little melted butter or gravy. There are many valuable oils extracted from this tribe of plants; even the soda we use is the produce of one of the *salsolas salicornias*. The best of this tribe of plants is grown on the continent for the purpose of distillation. In France it has been extensively cultivated for its sugar, and also in Ireland it is now being extensively cultivated for that purpose, as the soil and climate of that country is favourable to its growth.

CHARACTER.—The *beta vulgaris*, or field-beet, differs from the garden varieties, inasmuch as it grows to a larger size, and more above ground; its cultivation in the agriculture of this country is of a recent date, having been brought over from the continent by Dr. Lettson, about the year 1804, and from the accounts given of its mode of culture in Belgium, the Rhine, and other parts of Germany, it is to sow the seed in beds, and transplant it into lines. Our mode of culture, until recently, was to treat it in every respect similar to the turnip, until ex-

periments were tried by some eminent growers in the south whose exertions tended to increase and improve the growth of this plant to a great degree of perfection; indeed, our information regarding its growth is mainly indebted to the experience of the southern growers, and which has been promulgated from time to time through the medium of the agricultural periodicals.

CLIMATE.—The growth of the mangold north of the Humber is very limited compared with that of the south of England; nor is it largely grown in Scotland, on account of the climate of the country not favouring it so much as it does the turnip; yet there are exceptions, as I can testify having seen some very large crops of mangold raised at Dalkeith-park, the seat of the Duke of Buccleuch, near Edinburgh. The influences of climate on the growth of this plant are very apparent, as it invariably thrives best in a warm, moist temperature; hence it is that the advantage is considerably in favour of the southern growers.

SOILS.—Soils in this, as all other plants, exercise no small amount of influence; yet it is somewhat cheering to know that the beet-root has been found to thrive on almost every description of soil where artificial means were not wanted. The soil, however, intended for mangold should, if possible, receive a deep ploughing in the previous autumn, with the necessary harrowings and rolling to admit of the land being made clean; then a light dressing of fold-yard dung should be applied, at the rate of seven or eight loads to the acre; the land should be ploughed back immediately so as to cover the manure, and thus it remains until spring, and about the end of

March or beginning of April the manure will be found to have entered into decomposition with other elements of the soil; should it be of a stiff or retentive nature, another ploughing will be necessary, and also the assistance of the large and small harrows in order to have the soil reduced to the finest possible tilth.

PREPARATORY TO SOWING.—Immediately preceding seed time, from the last week in April to the middle of May, the ground is rowed at a distance of from 27 inches to three feet apart, depending on the nature of the soil; this may be done by the double mould-plough going out one way and returning in the same furrow. The subsoil plough should then be introduced, for the purpose of stirring the subsoil at a depth of from ten to twelve inches further; by so doing it causes a decomposition of mineral matter, and enables the ammonia contained in rain to unite more freely with the other acids in the soil, and induce the roots of the plants to follow in search of nutriment: when this is done richness and fertility will be sure to follow.

MANURE.—The manure at this season should have been well fermented and of the best description of fold-yard dung, which may be applied in the manner of the turnip, and at the rate of about six tons per acre; but as a combination of other artificial manures, such as Peruvian guano, salt, bones, and rags, are all important agencies, we will again refer to them, and give the quantities of such as others and ourselves have found to answer best, viz., in addition to the above quantity of fold-yard dung, there should be applied $2\frac{1}{2}$ cwt. Peruvian guano and $2\frac{1}{2}$ cwt. common salt per acre; the drills should be split back, and then rolled with a very light roller before sowing.

SEED.—The seed should be new, because when it exceeds one year old vegetation becomes a matter of uncertainty. In purchasing the seed care should be taken that none of the garden varieties are selected. The following varieties will be found to answer, having been long approved of:—Long red, long yellow, orange globe, and orange red; the two former thrive best on deep soils, and the latter on soils of a lighter nature. Before sowing the seed it should be soaked in tepid water about forty hours; being enveloped in a thick husk it requires well moistening to encourage speedy vegetation; when this practice is omitted the seed may remain dormant and inactive in the ground for a length of time, especially if the season be dry and the soil in a stiff state. The time of sowing is from the 20th of April to the 20th of May; if sown earlier the plants are apt to run to seed in the autumn. I have seen at Dalkeith-park, when the seed was treated in this manner, plants appear above ground on the sixth day after being sown.

SOWING WITH THE DRILL.—The turnip-drill may be advantageously used for sowing the mangold seed, where the object is to go through the work in haste: acres may be sown in a day. The quantity of seed will run about 6lbs. per acre; but for our part we are decidedly in favour of getting in this seed by means of

THE DIBBLE.—For all that it does appear to be a slow process, yet there are advantages which amply make up for this. For instance, at the time the plants require to be thinned, a less number of hands would be required to thin an acre than when the drill was used; and, besides, the plants invariably come up more regular when dibbled, and the distance from plant to plant is certainly better regulated than could be done after the drill. The dibble is formed of pieces of wood, the principle of which resembles the head of a common hay rake—length, 5 feet. The pins, which may be set in at distances

varying according to the nature of the soil, from 10 to 15 in. apart, having an upright handle about 30 inches long, with a cross at the top to enable the workman to press it to the soil. By an implement of this description a man would easily dibble an acre a day, and four active boys or women will deposit the seed as fast as he can ply the dibble. The number of seeds deposited in each hole should not be less than two or three. The covering of the seed (which should not exceed one-half inch), is done by giving a light rub of the hand as they go along; between three and four pounds of seed will sow an acre. This, with the exception of one or two hoeings, is all that will be required to be done until the plant comes up to a sufficient size to be thinned.

THINNING.—Thinning should be performed in a careful manner, at a time when the plants will have attained the size of, and stages for, thinning the Swedish turnip. Our mode is to pass a Dutch hoe lightly on the top of the drill, and to have persons follow, who thin them out to a single plant in each space. This is done by the hand only.

HOEING AND SUBSOILING.—The frequent use of the horse hoe will at this period be found highly advantageous; and, in the course of two months of favourable weather, the plants will have grown to a good size, when the subsoil plough should be exercised between each drill, for the purpose of again stirring up the soil a good depth, and cutting the spreading roots, which has the effect of forcing the main root further down in search of food. In a short time after, the plants will present a luxuriant appearance, and cover the whole surface, leaving but little chance for weeds to take up their quarters with them. With respect to the practice of some, who bank up mangold-wurzel, I will only remark that in no instance is this performed but by persons who do not study the nature and habits of this plants; therefore I would at once proscribe it as a barbarous practice.

STORING ROOTS, USE OF LEAVES, ETC.—Towards the end of October, before frosty weather sets in, the leaves will begin to turn yellow, when some may be pulled off, and given advantageously to any description of stock. The pulling up of the roots should then be proceeded with, in a very careful manner, taking all possible care that no wounds are made by the knife on any part of the roots, as they are long tender, and highly susceptible of injury, and bleed to a serious extent when handled roughly. Our practice is to scrape off all the soil and leave the fibres. The leaves are cut off with a slope at the base of the stem. The roots are then piled in an oblong form, and covered a good thickness with short straw, and over this is a coating (about two inches thick) of long straw, and tied down so as to turn the rain, and prevent the chance of frosts coming in contact with this very tender root; and in this manner they would keep until June or July. The leaves that remain should be spread and ploughed-in while green, otherwise their valuable properties as a manure will be lost, as they contain a large amount of vegetable matter in a green state, which forms a highly-fertilizing agency to almost every description of soil; but if allowed to remain exposed to the influence of the atmosphere, even for a few days, some of their most essential ingredients would have been carried off by evaporation.

RESULT OF OUR OWN EXPERIENCE.—It will be seen from the preceding remarks, that I have given what I consider the leading topics connected with the culture of the mangold wurzel, or field beet, and, having had to do with it for some years past, I will append the result of a crop of $4\frac{1}{2}$ acres, sown on the Houghton-hall home farm in 1852.

The first division contained two acres, which produced 68 tons

clean dressed roots, quoting the lowest value at 15s. per ton	£51 0 0
Deduct for 12 load of manure laid on in the autumn, at 5s.	£ 3 0 0
Ditto 12 ditto laid on in spring	3 0 0
Ditto 5 cwt. Peruvian guano, at 10s.	2 10 0
Ditto 10 cwt. common salt, at 1s.	0 10 0
Rent £2, taxes 10s., labour £6, total	8 10 0
	<hr/>
	£17 10 0

Leaves a balance on two acres of £33 10 0

Second division contained 2½ acres; the produce was 72 tons, at 15s.	£54 0 0
Deduct for 30 load manure, at 5s. ..	£ 7 10 0
Ditto 2½ cwt. Per. guano, 5 cwt. salt	1 10 0
Ditto 3 cwt. Lawes' patent manure. .	1 0 0
Rent, &c., £3 10s., labour £7	10 10 0
	<hr/>
	£20 10 0

Total profit on 4½ acres of mangold £67 0 0

where the soil was all alike, but owing to the difference of manuring in the autumn, and having the drills three feet asunder, and the plants 15 inches in the first division, the corresponding profit is so apparent as to need no further comments. I may, however, state that, in the second case, the drills stood 27 inches asunder, and the plants 10 inches apart.

RESULT OF CROPS.—Doubtless this statement by some would be looked upon as exaggerated, but such, however, is the fact, and can be attested; nor is it by any means extraordinary, as will be seen by the following statement made by Mr. Stephens, author of "The Book of the Farm," who says (see Book of the Farm, second edition, vol. ii. page 429), that Lord Lovelace raised at Oakham Park, large crops of long red mangold-wurzel in 1831, as much as 58 tons 8 cwt. 60 lbs. an acre, on an average of 12 years, from 1831 to 1842 both inclusive, the quantity was 47 tons 19 cwt. 59 lbs. an acre; in 1841 and 1842 he raised 42 tons 3 cwt., and 43 tons 2 cwt. of the orange globe variety, to the acre. As the principles of culture is somewhat similar to the one I have described in this essay, I will not dwell upon it further than state that the quantity of farm-yard dung applied in this case was at the rate of 30 cubic yards per acre; this would certainly be considered, in a majority of cases, not only an expensive but an extravagant dose. I give also extracts from a series of experiments made by (from the Journal of the Royal Agricultural Society of England) Mr. Pusey, of Pusey, in 1845, to show how far the growth of the mangold may be effected by a combination of artificial manures. An acre of soil unmanured produced 15½ tons field beet; ditto manured with 13 loads dung, 27½ tons; ditto 13 loads dung and 7 cwt. rape dust, 27 tons; ditto 13 loads dung and 14 bushels bones, 26 tons; ditto 26 loads dung, 28½ tons; ditto 13 loads dung and 7 cwt. rags, 36 tons; ditto 13 loads dung and 3 cwt. Peruvian guano, 36 tons: thus it will be seen that the greatest increase of roots was obtained by adding two different artificial manures to a fair good dressing of dung. Another great improvement was introduced by Mr. Thompson, steward of the Duke of Beaufort, and whose opinion is favourable to the preparation of the land (by manuring it) in autumn, and having the drills wide apart, from the fact of perceiving how much better the outside row invariably was to that of the others; and determined to give the idea a fair trial, he planted a portion of his mangolds in the usual way, and another he had planted in alternate rows with carrots: the result was, a greater weight of roots was produced on the latter than by a continuation of one sort, as in the former; and besides this (to use his own words) the crop of carrots so raised was the best ever grown here

(with him), both as regards quality and weight. This statement is fully affirmed by Mr. Pusey, who, it appears, saw the crops, and after tried the experiment, which had a satisfactory issue, and (to use Mr. Pusey's words) may be described shortly as a method of not only improving the mangold crops, but of getting 8 tons of carrots for nothing.

BET AS FOOD FOR STOCK.—Beet is found well suited as food for milch cows, and contains large proportions of very nutritious properties, which have a tendency to make them give a greater quantity of milk than any other description of root with which I am acquainted, save the cabbage, nor does it convey that disagreeable flavour either to the milk or butter as the turnip does. Beet seems a general favourite among stock. Pigs will make themselves fat upon it; calves do well upon a small portion of it; and so would sheep, and especially ewes, which, if given to at the rate of one root each per day during lambing time, would cause them to give abundance of milk to the lambs. Feeding beasts do remarkably well on it; but it should be given very cautiously in the beginning, as they eat it with such avidity as to cause danger of a serious nature. Therefore, a small root would suffice for the first time, then to increase the quantity by degrees. I have known an instance of fat beasts increasing at the rate of 12 to 14lbs. per week, when fed on mangold and linsced cake, with plenty of straw.

COMPARATIVE ANALYSIS.—The following interesting extract from a contemporary may be interesting: "According to the analysis of Dr. Voelcker, turnips (their relative value as taken from the field depends, of course, in a measure, upon the quantity of water contained in the roots; but, when dry, they contain more nutriment in a given weight than a dried carrot) are worth more as feeding substances than carrots; but it is generally supposed that carrots are better than turnips, and that mangold-wurzel lies between the two. Mangold-wurzel, according to analysis, are more nutritious than either turnips or carrots. The experimental sheep fed on mangold-wurzel at first increased much faster than those fed on turnips; but, lately, those fed on turnips have increased most, and the others have begun to refuse their food, eating scarcely five pounds per diem of mangold-wurzel. An equal quantity of mangold-wurzel goes farther in feeding stock than the same quantity of turnips, as the latter contain frequently a larger per-centage of water.

ANALYSIS CONTINUED.—The following are the different inorganic substances contained in one ton of mangold, according to Professor Way:

	Bulbs.	Tops.
Silica.....	0.54	0.76
Phosphoric acid ...	0.66	1.94
Sulphuric acid	0.65	2.20
Lime.....	0.41	3.31
Magnesia.....	0.43	3.27
Peroxide of iron ...	0.12	0.52
Potash.....	4.99	7.86
Soda.....	3.62	2.52
Common salt.....	5.29	12.82

Boussingault's analysis of the field beet is:

Carbon.....	428
Oxygen.....	434
Hydrogen.....	58
Nitrogen.....	17
Inorganic matter.....	63

1,000

It will be seen, by Professor Way's analysis, that this root contains a large per-centage of common salt; and hence it is that a good dose, applied to soil intended for this crop, will be found of great importance.

COMMON SALT.—When at a distance from the sea, the effects of salt on all cultivated crops (but especially on the beet) will be found applicable in more than one district, nay, as its fertilizing influences are necessary to the healthy growth all the cultivated plants within the limits of the farm.

FURTHER TESTING.—Having stated my opinion as to the utility of combining at the rate 3 cwt. common salt, and 2½ Peruvian guano, with a fair dose of good fouldyard, as the best means (where the land is drained and well tilled, with the advantage of a good season) to raise a large crop of field beet, and will again refer to Mr. Stephens, who in speaking of guano, says (see Book of the Farm, sec. ed., vol. 9, page 416,) that Professor Way has analyzed such a great variety of guanoes since the analysis of Professor Johnson (3349) that I must abstract a few of his results, as they will be found highly interesting to the farmer, from the small quantity of guano that may now be expected from the African coast, and from Patagonia, any other kind than the Peruvian need not attract the attention of the farmer at whatever price it may be offered in the market. Another consideration beside quantity renders any guano but the Peruvian of little value to the farmer, which is that as guano is chiefly employed for the sake of its ammonia, the African and Patagonian kinds being composed chiefly of phosphates are not suitable as substitutes for the Peruvian, which contains a large proportion of the ammoniacal compounds, as may at once be seen by the following comparison. The ammonia is as follows:—

In Peruvian guano, 32 specimens	17—41	per cent.
Ichaboe, 11 specimens	7—30	do.
Patagonian, 14 specimens	2—54	do.
Saldanha Bay, 20 specimens	1—62	do.

The phosphate of lime is as follows, in the same specimens:—

Peruvian guano	24—12	per cent.
Ichaboe	30—30	do.
Patagonian	44—60	do.
Saldanha Bay	56—40	do.

As all guanoes have no doubt originated from a similar source, every ton of Saldanha Bay may be regarded as two or more tons of the Peruvian, from which fermentations and rain have removed the greater part of its ammoniacal compounds.

CONCLUDING REMARKS.—Before bringing this little pamphlet to a close, I wish to impress on the reader, who may be desirous of cultivating the field beet, that it contains a combination of facts from some of the most eminent agriculturists of the day, and, tested by my own experience, will, I hope, be a sufficient guarantee against any doubts which might arise in the reader's mind as to the *modus operandi*; and should the plain and familiar outline which I have endeavoured to give of the culture and management of this species of green crop throw light, or tend in the slightest way to increase its health of culture, it will have fully realized my wishes. In conclusion, I would urge on the cottager who can spare a small patch of ground to grow a little beet-root for his cow, as nothing has a greater tendency to cause abundance of milk than the mangold; and were he to intermix it with Silesian or suggest variety of beet, it would enable him to have recourse to an excellent and delicious root, which might be used by his family, when boiled, with cold mutton or any other cold meat, or as a pickle. When the roots are to be boiled, it should not be cut nor trimmed, lest in boiling it the colour should be lost; it only requires a clean washing before it is cooked. This variety (the Silesian) makes excellent beer, as will be seen by the following receipt of a Mr. Baker (see Johnson's "Farmer's Almanack," for 1853, page 63), who says, by the middle of November thoroughly cleanse the beet roots, then slice them with a

gardener's turnip-slice, and the slices spread and thoroughly turned over for three or four days on a barn or malt floor. This partially dries them; then dry them carefully and thoroughly on a malt kiln, taking care not to burn them (the charge by the maltster is about 15s. per ton). One ton of beet will produce from 16 to 18 bushels of dried beet; 2 bushels of this are more than equivalent to a bushel of malt. The wort is made in the usual way, and boiled with 1¼ lbs. of hops to each 1½ bushels of beet. The fermentation of beer is seldom sufficiently attended to; if possible, the fermentation ought never to commence until the wort is under 55 degrees Fahrenheit—from 45 to 65 degrees may be taken as the extremes. 12s. per hogshead is the utmost cost of the beer, which in two months is quite clear and ready for use, whilst good table beer may be produced at 8s. per hogshead.

CHANDLER'S LIQUID MANURE DRILL.

SIR,—Having used one of Chandler's liquid manure drills for turnips the last six or seven years with the greatest success, I am induced to reply to the objections to that drill, stated by Mr. Spooner in his lecture at the London Farmers' Club, "on the application of manure in a liquid state," and reported in your paper of this week.

The objections appear to be three—

1st, "The mixing and stirring up the liquid depend on the rotation of the buckets." Certainly it does, and a most effectual stirring up it is: subsidence in any great degree is impossible, with the continued action of the revolving buckets.

2nd, "When the drill arrives at the end of the field, it takes perhaps two minutes to get into action again." There can be no appreciable difference betwixt one drill and another in this respect; the first step or two of the horse tips the first full bucket over the axle, and will be just as long falling to the ground as though it fell from one of Mr. Spooner's taps.

3rd, "During the time which elapses, a great deal of the manure sinks to the bottom; and the result is, that in some parts of the field there is deposited a large quantity of solid manure, and in other parts a small quantity." As the proof of the pudding is allowed to be in the eating, the beautifully even crops of turnips I have always seen after Chandler's drill should go to prove that the manure has been evenly distributed; nor is it easy to suppose how it can be otherwise, with the continued plunging of the buckets to the bottom, keeping the liquid in motion.

I have not the pleasure of personally knowing Mr. Chandler, and have no interest in blowing his trumpet. I have, however, on a former occasion stated the particulars of trials made betwixt his drill and the Ash drill, with the same manure, the result of which was not less extraordinary than as stated by Mr. Pusey himself in the 13th volume of the Journal of the Royal Agricultural Society. It is scarcely possible for like trials, made with the Southampton drill, to be more triumphantly in favour of liquid manure for turnips; whether in fact is it better to make a solution in a tank and ladle out, or have two deliveries, the meeting place being the top of the pipe?

We owe so much to Mr. Chandler for his very valuable liquid manure drill, that I don't like to see him knocked down in a lecture room; it must be a field fight, and a fair one. At present, I shall back the buckets.

I remain, yours &c.,

M. RAYNES.

Frome, April 15th, 1854.

TESTIMONIAL TO THE REV. B. BERIDGE, OF ALGARKIRK.

The present has been termed, and not perhaps inaptly, "the testimonial age." We have had almost too much of a good thing, and brought into ridicule, simply by our excess in employing it, a custom which should honour only as it discriminates. On the other hand, a too easy compliance with the call made upon us, a good-natured indifference that at once agrees to subscribe its mite towards doing homage to the excellencies of anybody, go far to defeat the object intended. We respect people by hearsay, and express to them our gratitude for the most extraordinary of offices. One man shall have a testimonial on the very satisfactory showing that he has contrived to make his own fortune. Another may command a similar offering as a tribute to that genius, which, having hit on an invention, has, in the truest spirit of patriotism, made it especially serviceable—to himself! All the world of course reverences men like these, without perhaps exactly knowing why they do so, but well content with the assurance that success is the safest sign of merit.

We must confess that we pay but little attention to homage of this description. If we must receive a testimonial in evidence, we should prefer infinitely that from a few friends and neighbours who did know something of their man, to the indefinite declaration to be gathered from a far longer list of admirers. There is something of a spontaneous and hearty expression about the one that we seldom as easily recognize in the other. It is going to a man's own home for his character, rather than trusting to what all the world may think it knows about him.

There is no class in this country to which we are more anxious to pay all proper respect than to the landed gentry, and none that it affords us more pleasure to see appreciated by those amongst whom they live. The initiative in all matters touching on the prosperity of the rural districts must in a great degree be with the landowners. If they do their duty, we have a tolerably good assurance that others necessarily more or less dependent upon them, will also be progressing in the right direction; while the more the latter advance, the more will they be prepared to thank those who have afforded them the example and the aid to do so. A good landlord, who takes a real and active interest in the management of his estate, cannot do good to himself alone; the more he improves his own condition, the more does he tend to improve those who live around him.

Lincolnshire has long been famous for its "breed" of landlord as well as of tenant, and it is of the honour lately paid to the one by the other that we have now to speak. A few days since, within this week only, the tenantry of the Rev. B. Beridge, of Algarkirk, assembled at Sutterton, to offer a testimonial to their landlord, "as a token of their esteem and obligation." The subscription was confined closely to those from whom it was assumed to emanate, the treasurer "making it a point of not accepting a shilling from any person who was not actually a tenant." In the words of the same gentleman, "it was their own spontaneous gift" to one who, as another said, "assisted us when we needed assistance, helped many of us out of difficulties, and is ever ready to aid in all things conducive to our own interests."

The assistance of Mr. Beridge, however, appears to have been no blind or indifferent boon, given merely because he felt that he was called upon to do so. Had it been, we do not know that we should have had much more to say on the subject. We think, however, we can gather sufficient from his own words to prove something more than this, and that he only encourages those who will do their duty to themselves. In any case, we can congratulate the reverend gentleman on a most manly, and, as it strikes us, on a most able address—one marked by no affected self-depreciation, but honestly avowing what he expects to see done, conjointly with what he himself may do. Holding a high, and, as we are told, a deservedly distinguished position in that county in which the business-like understanding between landlord and tenant has long been proverbial, we may borrow from so good an authority some few hints as to how this arrangement is to be arrived at.

Here, to begin with, is the tenant who will *not* do for Lincolnshire, nor for any other shire, if Mr. Beridge's words should have anything of that weight we would attach to them—

"When I advocate the maxim of 'LIVE, AND LET LIVE,' I am anxious not to be misunderstood, as I am most desirous that there should be no mistake with regard to the conditions upon which you may consider yourselves entitled to my sympathy, assistance, and good will. I can assure you, then, that nothing can be further from my wishes than to have any tenant connected with my estate who does not possess that requisite amount of industry, prudence, judgment, and capital, which are such essential qualifications in these days to make agriculture a profitable, or, indeed, a respectable occupation. For I am sure you will agree with me that that most hopeless and, I am sorry to say, not uncommon class of farmers, who merely

half plough, half weed, and half manure, and then complain of half crops, is not deserving of encouragement or any consideration whatever. On the contrary, he is taking the most effectual means of ruining himself, beggaring his farm, and, as a natural consequence thereof, so far crippling the resources of his landlord as, in many cases, to deprive him of those means which he might otherwise have been glad to employ for the relief of his more deserving tenants in their hour of need. Indeed, such a man may truly be said to cumber the ground, as he is not only injuring himself, his family, and his landlord, but what is a much more extensive evil, by that false economy of a niggardly employment of labour, he is depriving of their legitimate means of support many of that most deserving class whose comfort and well being it is not only our interest, but our paramount duty to provide for,—I mean the industrious poor. In fact, such a tenant is a blot upon any man's estate, and for the bad example he sets his neighbours, he deserves to be made an example of himself, as he is in reality benefitting no human being upon earth, unless it may be these most unwelcome visitors in their professional character, the bailiff and the auctioneer."

Although, as Mr. Beridge himself observes, there may be nothing exactly "new" in this, it is famously put, and tends the more to assure us how intimate the connection between, and how dependent on each other, the prosperity of landlord, tenant, and labourer. Hard as the truth may be, no one is in a more unfortunate position, and none does so much general injury as the man who takes more land than he has capital to cultivate. It has long been the bane of the sister kingdom, as it is still the impediment in many parts of this. In Lincolnshire, after all, the great secret of success is *capital*—its use and its security.

In the above extract we have a picture of what a tenant should *not* be. Let us now accompany it with one from the same able hand of what he should:—

"Believe me, there is no greater truth than that expressed in the old saying, 'If good management won't pay, bad cannot.' Now, being upon the subject of management, permit me, as a brother agriculturist, to suggest to your consideration a few plain rules for the cultivation of your farms, the advantage of which I have myself experienced, as well as suffered from the neglect of them; and the adoption of which on your part, I feel sure, you will never have occasion to regret. In the first place, then, begin with draining your land, when necessary, of its superfluous water, or I fear you will soon have to complain of having drained yourselves of your superfluous cash. Secondly, as far as lies in your power, never suffer the soil to produce anything but what you put into it, remembering that 'ill weeds grow apace,' and that there is no crop so ruinous to cultivate, so disgraceful to possess, and so expensive to eradicate. Thirdly, endeavour to keep your farms in such a state of high cultivation that you may be enabled to take your crops *off* the land instead of *out* of it; that is to say, having invested your capital in your farm, be satisfied with a fair return of interest for it, without dipping into and thereby gradually exhausting your principal; for, you may rest assured, that most improvident habit of *overcropping*, or in any way detracting from the productive quality of the soil, will in the long run prove equally detrimental to the tenant as well as to the landlord. Lastly, which is the most im-

portant rule of all, as its non-observance involves an incapacity to carry out the preceding ones, never hamper yourselves with more land than you have ample capital to manage, the probable result of which would be, that your farm, instead of being a comfort and a profit to you, will hang like a mill-stone about your neck, and if you continue to embark in so hopeless a speculation, it will ere long rob you, or rather you will rob yourselves, of your last shilling."

We have the word of Mr. Beridge's tenants as to his character as a landlord—we have his own as to that of his tenantry. It is with practical knowledge of this nature to direct the power placed in their hands, that the landlords of England generally might enforce so excellent an example, and accomplish so much real good. It is to the address of one of their own order—"a prophet in his own country," too—that we would now call not only their attention, but equally that of the working agriculturist. Here is no mere expression of good will, no empty assertion of fine feeling, but a plain straightforward address, detailing with all the emphasis of experience and inclination, how each one should do his best "to make agriculture a profitable and a respectable occupation."

PRESERVATION OF VEGETABLES.—A French agriculturist has just published a process which he has employed for the preservation of beet-root, and which is equally applicable to potatoes, carrots, &c. The plan pursued by him is described as follows:—"At the time of gathering the crop I cut off the leaves, and having first strewed a layer of the ashes of liquites on the ground, place a layer of the beet-root on it, and then go on with alternate layers of ashes and beet-root until the whole are deposited, after which the pile is covered with ashes, so as to keep the roots from the cold, the air, and the light. Where the pile rests against a wall or a partition, ashes must be thrown between it and the roots. For want of the ashes of liquites, coal or turf ashes may be used, or even dry sand; but the last-mentioned article is not so effectual in absorbing the damp. This manner of proceeding prevents the roots from germinating, and consequently preserves them fit for use."

STORING APPLES IN DRY SAWDUST.—I have a dark closet in my house, or rather I live in a row with windows back and front. The house is four storey high, and the length from front to back is so great, that we have three rooms on a floor, the centre one dark. On the third storey the floors are plaster, and I find the temperature so even that I use it for a wine store in preference to the cellar, and have it fitted with bins. In this room I put some hampers of apples (like pearmain). I wanted one of the hampers, and turned the apples on one of the bins, amongst the dry sawdust (pine sawdust). A fortnight ago we looked at them, having used up the others gathered at the same time and from the same tree, all of which were much wrinkled, but on taking those off and from amongst the sawdust, I found them in a most beautiful condition: those covered with sawdust were as plump and fresh as when gathered, while those partially buried were only so to the extent covered with the sawdust, the upper portions being wrinkled. I am so pleased with the discovery that I shall pack them in bins next year, for I have no doubt they will keep in this way till next Christmas.—*Correspondent Am. Agriculturist.*

STALLIONS FOR THE SEASON 1854.

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of Winners out by	Sire of	Standing at	Apply to	Price.
Abernethy	—	—	by Physician, dam by Oville	never appeared	won Ascot Cup	19	Frankie	Hampton, Thirk	Mr. M. Wright.	5 gs., h. b. 2 gs.
Alarm	bay	12	by Venison, out of Southdown, by Defence	started 17, won 13	won Ascot Derby	untried.	Flying Dutchman	Danebury	Mr. Markwell ..	10 gs., h. b. 5 gs.
Amorino	bay	14	by Velocipede, out of Jane Shore, by Wolf	started 3, won 1	won Ascot Derby	untried.	Adelphi	Adelphi, Chester ..	J. Gilbert	40 gs., (23 mares, full)
Annandale	brown	14	by Touchstone, out of Rebecca, by Lottery	started 15, won 3	ran second for Derby ..	17	Midas	Burgley, Stamford ..	Mr. H. Rose	£2 10s.
Arley	bay	15	by Camel, out of Garcia, by Octavian	started 8, won 3	won £1000 at Newmarket	315	The Baron	Easby, Richmond, York ..	Mr. J. James	50 gs., (20 mares)
Auger	chestnut	9	by Irish Birdcatcher, out of Nickname, by Ishmael	started 4, won 3	won Champaigne Stakes	untried.	Liberty	Rodhouse, St. Albans ..	Mr. G. Smith	55 10s., h. b. 42 15s.
Backbiter	brown	5	by Gladiator or Don John, out of Scandal, by Selim	started 24, won 5	won Champaigne Stakes	untried.	—	Murrell Green, Winck ..	Mr. Goddard	50 svs., h. b. half price
Bay Middleton	bay	21	by Salton, out of Cobweb, by Phantom	started 7, won 7	won the Derby	107	—	Water Tower, Rugby ..	Mr. Walker, V.S. ..	2½ gs.
Bodouin	bay	25	by an Arabian, dam by Wanderer	never appeared	won Drawing Room S. ..	untried.	—	White Hart, Welwyn ..	Mr. Tredgett	5 gs., h. b. 2 gs.
Beiron	chestnut	25	by Sultan, out of Miss Cantley, by Stamford	started 17, won 6	won the Madriids	untried.	—	Palace Stables, New ..	Mr. Mockford	5 gs., h. b. 2 gs.
Birdcatcher, Irish	chestnut	11	by Sir Hercules, out of Guiccoli, by Bob Footy	never appeared	won the Royal Hunt Cup	untried.	—	Taunton	Mr. Hopkins	5 gs., h. b. 3 gs.
Birkenhead	brown	21	by Liverpool, out of Archine, by Filio-da-Puta	started 61, won 26	won Ascot Stakes	6	May Day	Eaton Sud House, ..	Mr. Phillips	10 svs., h. b. 5 svs.
Bishop of Rome	bay	5	by Jereed, out of Jehnna, by Count Porro	never appeared	won Gornhambury Stakes	untried.	—	Chester	—	5 gs., h. b. 5 gs.
Bond's Gob	black	12	by Touchstone, out of Queen of Trumps, by Velocipede	started 1,	won Doncaster Cup	untried.	—	Water Tower, Rugby ..	—	5 gs., h. b. 5 gs.
Black Prince	black	8	by Lamecol, out of Flambean, by Turcoman	started 13, won 4	won Hopeful Stakes	untried.	—	White Hart, Welwyn ..	—	7 gs., h. b. 2 gs.
Blaze	brown	10	by John o' Gaunt, out of Spangle, by Cressus	started 7, won 3	won the Pendelgast S. ..	untried.	—	Palace Stables, New ..	—	5 gs., h. b. 2 gs.
Bolingbroke	chestnut	7	by Amaranth, out of Miss B'we, by Catton	started 16, won 9	won Bickestaffle Stakes ..	untried.	—	Taunton	—	5 gs., h. b. 3 gs.
Bowstring	chestnut	10	by Venison, out of Zeila, by Emilius	started 18, won 6½	won Ascot Stakes	untried.	—	Chesler	—	10 svs., h. b. 5 svs.
Buckthorn	bay	5	by Emilius, out of Filagree, by Sootsayer	never appeared	won Gornhambury Stakes	untried.	—	Chesler	—	5 gs., h. b. 5 gs.
California (Bro to Riddlesworth)	chestnut	21	by Zingane, dam by Rubens	started 27, won 12	won Gornhambury Stakes	untried.	—	Bushbury, Wolter ..	Mr. Phillips	5 gs., h. b. 5 gs.
Calmark	bay	13	by Slane, out of Cobweb, by Phantom	started 1,	won Doncaster Cup	untried.	—	Haworth Arms, New ..	D. Price	7 gs., h. b. 2 gs.
Catsby	bay	11	by Irish Birdcatcher, out of Whim, by Drone	started 37, won 21	won Doncaster Cup	untried.	—	Warwick	Mr. Brown, V.S. ..	10 gs., h. b. 5 gs.
Chancellor	grey	10	by a pure Desert Arabian	never appeared	won the Royal Hunt Cup	untried.	—	Rawcliffe-farm, York ..	T. Bateson	12 gs., (50 mares)
Clark	grey	7	by a pure Cleveland horse	never appeared	won Great Yorkshire H. ..	untried.	—	Brandisy, Buttercrauh ..	Mr. Kettlewell	5 gs., h. b. £1 11s. 6d.
Cleveland Short-legs	bay	11	by Sheet Anchor, out of Kalmita, by Magistrate	started 70, won 34	won the Royal Hunt Cup	untried.	—	Duddinghill, Willesden ..	J. Bullock	3 gs.
Collingwood	bay	6	by Harkaway, out of Guiccoli, Bob Boofy	started 32, won 4	won the Corinthians	untried.	—	Newmarket	Messrs. Barrow	12 gs.
Concessor	bay	10	by Harkaway, out of Guiccoli, Bob Boofy	started 32, won 4	won the Corinthians	untried.	—	Theobald's Farm, Enfield ..	Mr. A. Gray	11 gs.
Connaught Ranger	chestnut	15	by Hymen, dam by Perchance	started 54, won 25	won Cesarwiche	5	Lancaster	Raewcliffe-farm, York ..	T. Bateson	5 gs., h. b. half price
Coranna	bay	10	by Heiman Platoff, out of Jonnina, by Prian	started 11, won 3	won the Derby	untried.	—	Repository, Dublin	Mr. Dyer	10 gs.
Cossack	chestnut	14	by Touchstone, out of Parma, by Whisker	started 19, won 7½	won the Derby	untried.	—	Stanton, Shifhall	Mr. Eyke	10 gs., (40 mares)
Cotherstone	bay	12	by Bay Middleton, out of Crucifix, by Prian	started 8, won 5	won Buckenham S.	47	Cheddar	Althorp, Northampton ..	Mr. Elliott	12 gs., (20 mares)
Cowl	chestnut	11	by Alcazon or Don John, out of Uganda, by Terevass	started 19, won 6½	won the G. York Hunt ..	untried.	—	Lebourne, Maidstone ..	Mr. Tweed	20 gs., (20 mares)
Cranbrook	chestnut	10	by Lamecol, out of Crucifix, by Prian	started 13, won 31	won £650 at Ascot	untried.	—	Northampton	Mr. S. Dickens	10 gs., h. b. 3 gs.
Crozier	bay	13	by Physician, out of Moss Rose, by Blacklock	started 3, won 1	received a Match forfeit ..	untried.	—	Ardee, Louth, Ireland ..	—	4 svs., h. b. 2 svs.
Cure, The	brown	6	by Touchstone, out of Moss Rose, by Blacklock	started 3, won 1	received a Match forfeit ..	untried.	—	Ardee, Louth, Ireland ..	—	4 svs., h. b. 2 svs.
Damask	black	6	by Lanercost, out of Barbelle, by Sandbeck	never appeared	won £50 at Chester	untried.	—	Ardee, Louth, Ireland ..	—	4 svs., h. b. 2 svs.
De Ruyter	bay	18	by Priam, dam by Bastard	started 13, won 3	won Chester Cup	untried.	—	Ardee, Louth, Ireland ..	—	4 svs., h. b. 2 svs.
Dey of Algiers	bay	19	by Trump or Waverley, dam by Comus	started 10, won 2	won St. Leger	52	Lady Evelyn	Kirkby Farm, Tufcasto ..	Mr. Logan	15 gs.
Don John	bay	5	by Touchstone, out of Galhane, by Physician	started 11, won 9	won £50 at Chester	untried.	—	Foxholes, Goustaug	Mr. Matthews	5 gs., winners, and dams of, <i>grails</i>
Emerystone	brown	20	by Langar, out of Olympia, by Sir Oliver	started 31, won 12	won Copeland Handicap ..	43	Pyrrhus the First	Duddinghill, Willesden ..	T. Bullock	20 gs., (30 mares)
Epirus	chestnut	8	by Gladiator, dam by Velocipede	started 8, won 5	won Somersetshire S. ..	untried.	—	Newmarket	Messrs. Barrow	10 gs., h. b. 5 gs.
Essedarius	chestnut	9	by Venison, out of Pleanary, by Emilius	never appeared	won Somersetshire S. ..	untried.	—	Newmarket	Messrs. Barrow	10 gs., h. b. 5 gs.
Fallow Buck	bay	13	by Sir Hercules, out of Guiccoli, by Bob Footy	started 9, won 5	won St. Leger	37	Goldfinder	Andler's Ash, Liss, Hunt ..	Mr. W. Ayling	5 gs., h. 1½ gs.
Faugh-a-Ballagh	brown	7	by Giovanni, out of Rosalie, by Maple	never appeared	won St. Leger	untried.	—	Dean's Hill, Stafford	Mr. Painter	12 gs.
Filio	black	7	by Giovanni, out of Rosalie, by Maple	never appeared	won St. Leger	untried.	—	Dorton, Thame	Mr. Watson	5 gs., (40 mares)

Flint	bay	9	by Venison, out of Birchday, by Pantalon	started 9, won	1	won	£1,000 at Goodwood	unrtd.	unrtd.	—	—	Newmarket	Messrs. Barrow.	5 gs.
Flatcatcher	bay	9	by Tomkins, out of Devereux, by Pantalon	started 9, won	1	won	2,000 gs. Stakes	unrtd.	unrtd.	—	—	Swadcliffe, Yorkshire	R. Thorpe	30 sovs.
Flying Dutchman	brown	11	by Middleton, out of Trelise, by Sandbeck	started 16, won	13	won	the Derby Stakes	unrtd.	unrtd.	—	—	Swadcliffe Farm, York	R. Bateson	10 sovs.
Foxtrot	chestnut	11	by Saddler, out of Trelise, by Trump	started 16, won	13	won	the Derby Stakes	unrtd.	unrtd.	—	—	Newmarket	Messrs. Barrow.	10 sovs.
Frost	chestnut	11	by Hart, out of Nell, by Blacklock	started 14, won	4	won	Richmond Handicap	unrtd.	unrtd.	—	—	Newmarket, Sec.	W. Charlton	5 gs., h. b. 2 gs.
Gabrier	bay	10	by Bay Middleton, out of Flycatcher, by Goodwin	started 14, won	4	won	£350 at Doncaster.	1	unrtd.	—	—	The Lodge Farm, Brackley	Mr. Faunter	5 gs., h. b. 2 gs.
Galaor	bay	16	by Melby Moleoch, out of Darioletta, by Amadis	started 13, won	5	won	Manchester Cup	5	unrtd.	—	—	Alton, Bedfordshire	Mr. Smith	5 gs., h. b. 2 gs.
Ganeway	chestnut	10	by Tomboy, out of Lady Moore Chase, by Trump	never appeared	—	—	—	—	—	—	—	Essex Abbey Rectory, York	R. M. Jacques, Esq.	10 gs.
Grandchild	chestnut	10	by Prentissontary, out of Glesby, by Sultan	started 4, won	3	won	the Clearwell	unrtd.	unrtd.	—	—	Hay Horse, Bromyard	Mr. B. Devereux	3 sovs., h. b. half price
Goshawk	chestnut	6	by Tomkestone, out of Collins, by Bangor	started 5, won	2	won	July Stakes	unrtd.	unrtd.	—	—	Holehouse, Bury	Mr. Whitworth	8 sovs., h. b. 2 sovs.
Grecian	chestnut	6	by Ephraim, out of Jenny Juniper, by Raceys	started 4, won	2	won	July Stakes	unrtd.	unrtd.	—	—	The Earl's Farm, Stocking	Mr. S. Matthews	8 sovs. [grazé]
Gressvener	chestnut	6	by Tomkestone, out of Miss Everley, by Stockport	started 3, won	1	won	Plymouth Vase	unrtd.	unrtd.	—	—	Willenden Paddock	Mr. C. Phillips	5 gs., d. of winners
Haraway	chestnut	20	by Economist, dam by Netherish	started 88, won	25	won	Goodwood Cup (2)	70	unrtd.	—	—	Duddinghill, Willenden	T. Ballock	12 gs.
Heartbreaker	chestnut	6	by Don John, out of Dilbar, by Touchstone	started 2, won	1	won	£45 at Newmarket	unrtd.	unrtd.	—	—	Willenden Paddock	Mr. C. Phillips	10 gs.
Hero, The	chestnut	11	by Chesterfield, out of Grace Darling, by De-lancey	started 87, won	23	won	Empress's Plate	1	unrtd.	—	—	Wentworth, Rotherham	T. Hones	10 gs. (40 mares)
Hobbie Noble	bay	19	by Pantalon, out of Phryne, by Touchstone	started 14, won	5	won	New Stakes	unrtd.	unrtd.	—	—	Willenden Paddock	Mr. C. Phillips	10 gs. (50 mares)
Humphrey	bay	15	by Sandbeck, out of Oceana, by Cerberus	started 46, won	11	won	Stockton Plate	1	unrtd.	—	—	Wrayley, Brigg	Mr. J. Ashton	3 sovs.
Ironhorse	chestnut	12	by Jerry, out of Turquoise, by Selina	started 22, won	11	won	the Port	unrtd.	unrtd.	—	—	Newmarket	Mr. J. Rogers	5 gs., h. b. 5 gs.
Joe Snow	chestnut	12	by Herberton Platford, out of Wallace, by Prim	started 57, won	8	won	the Kiwards	unrtd.	unrtd.	—	—	Beverly	Mr. Dalton	10 sovs., h. b. 5 sovs.
John O'Connell	bay	13	by Volskyde, out of Cynthia, by Partizan	started 64, won	3	won	Great York Stakes	unrtd.	unrtd.	—	—	Dring House, York	Mr. Willm.	10 sovs., h. b. 5 sovs.
John O'Grunt	chestnut	13	by Taurus, out of Maury, by Partizan	started 84, won	23	won	Newmarket S.	14	unrtd.	—	—	Turf Tavern, Doncaster	Mr. Chinnell	10 sovs., h. b. 21 sovs.
King of Partary	bay	7	by Bay Middleton, out of Madiana, by Malley	never appeared	—	—	—	—	—	—	Hodkings, Herts.	Mr. H. Giblin	5 sovs., h. b. 3 gs.	
King of Odds	bay	10	by Small-hopes, out of Muxland, by Emilius	started 17, won	15	won	3 Royal Plates	unrtd.	unrtd.	—	—	Northampton	Mr. S. Dickson	10 sovs., h. b. 3 gs.
Knight of Avenel	chestnut	7	by The Doctor, out of Blue Bonnet, by Touchstone	started 6, won	4	won	the Port	unrtd.	unrtd.	—	—	Aytlethorpe, Middlesbrough	Mr. T. Dawson	7 sovs., h. b. 3 gs.
Knight of Gwynne	chestnut	7	by Gilbert Gunner, out of Seaweed, by Shaw	started 17, won	5	won	Newton St. Leger	unrtd.	unrtd.	—	—	Smallfield, Banbury	Mr. Galliver	5 gs.
Krentham	chestnut	14	by Sultan, out of Francesca, by Partizan	started 13, won	6	won	Cleveland Cup	18	unrtd.	—	—	Duddinghill, Willenden	T. Ballock	5 gs.
Landlord	chestnut	17	by Camel, out of Epana, by Whisker	started 10, won	6	won	St. Leger	4	unrtd.	—	—	Holywell	Mr. Waterell	8 gs.
Libel	chestnut	12	by Peachstone, out of Pseudoaid, by Camel	started 7, won	5	won	Chorley Stakes	unrtd.	unrtd.	—	—	Duddinghill, Willenden	T. Ballock	5 gs.
Longbow	bay	13	by Imperial, out of Miss Howe, by Cotton	started 91, won	13	won	Stewards' Cup	unrtd.	unrtd.	—	—	Essex Richmond, York	R. M. Jacques, Esq.	10 gs., h. b. 5 gs.
Lordship	bay	14	by Giovanni, out of Mazarin, by Sultan	started 92, won	13	won	Stewards' Cup	unrtd.	unrtd.	—	—	Duddinghill, Willenden	R. M. Jacques, Esq.	10 gs.
Loup-Garou	chestnut	8	by Lanerosci, out of Moonbeam, by Tomboy	started 6, won	1	received	£15 ft.	unrtd.	unrtd.	—	—	Duddinghill, Willenden	T. Ballock	5 gs., winners half price
Magnet, The	bay	12	by Camel, out of The Queen of the Vale, by Thaurer	started 15, won	11	won	Granby Handicap	unrtd.	unrtd.	—	—	Audlem, Nantwich	Mr. Lisle	6 gs., h. b. 3 gs.
Malcolin	chestnut	17	by The Doctor, out of Mirrha, by Malick	started 8, won	2	won	Prince of Wales's S	7	unrtd.	—	—	Curston, Rugby	—	10 sovs.
Marston	chestnut	17	by Mantley, out of Miss Giles, by Lotery	started 10, won	5	won	Ascot Vase	unrtd.	unrtd.	—	—	Sheeps Great Driffield	Mr. R. Stockdale	7 sovs.
Mathematician	chestnut	18	by Emilius, out of Maria, by Whisker	started 10, won	5	won	Ebor Handicap	unrtd.	unrtd.	—	—	Lowfield, Wetherby, Sussex	Mr. Scott	5 gs.
Mellon	chestnut	20	by Huppier Chinker, dam by Cornutus	started 18, won	1	won	the Padstow S.	64	unrtd.	—	—	Turf Tavern, Doncaster	W. Scott	10 sovs. (5 mares)
Mentor	black	13	by Volcador, out of Calypso, by Orville	started 19, won	4	won	Liverpool S.	unrtd.	unrtd.	—	—	Wrayley, Brigg	Mr. J. Ashton	10 sovs.
Meteor	chestnut	13	by Volcador, out of Dido, by Whisker	started 2, won	1	won	2,000 Gainsborough S.	2	unrtd.	—	—	Turf Tavern, Doncaster	Mr. Lucas	10 sovs., h. b. 3 gs.
Mickey Pee	chestnut	13	by Ismail, or Irish Birdcatcher, out of Annie	started 23, won	12	won	Cleveland Cup	1	unrtd.	—	—	Tockhill Castle, Kothar	Mr. Hornshaw	5 gs., h. b. half price
Midas	chestnut	6	by Beina, out of Merype, by Voltire	started 95, won	9	won	Newmarket St. Leger	unrtd.	unrtd.	—	—	Bargley, Stamford	Mr. H. Rose	10 sovs.
Milday	chestnut	21	by Slane, out of Sansouche, by Voltire	started 17, won	11	won	Ascot Vase	unrtd.	unrtd.	—	—	Essex Richmond, York	R. M. Jacques, Esq.	10 gs.
Murray, The	chestnut	21	by Muley, out of Mouchy, by Dick Andrews	started 17, won	11	won	the Port	2	unrtd.	—	—	Lincoln	Mr. Richardson	5 gs., h. b. 3 gs.
Neasham	bay	21	by Mammon, out of Mouchy, by Endless	started 2, won	4	won	£20 at Warwick	4	unrtd.	—	—	Polesworth	Mr. Church	5 gs., h. b. 41 gs.
Newport	bay	11	by Helton Plover, out of Wasp, by Muley	started 2, won	3	won	Northumberland P.	unrtd.	unrtd.	—	—	Middle Park, Enfield	P. Bass	6 gs., h. b. 3 gs.
Newport	chestnut	8	by Sir Hercules, out of Syrph, by Spette	started 10, won	1	won	Herford Stakes	unrtd.	unrtd.	—	—	Althorp, Northampton	Mr. Elliott	10 gs.
Nesbitt	chestnut	11	by Ephraim, dam by Zimmerman	started 18, won	1	won	Derby	unrtd.	unrtd.	—	—	Norwood, Beverley	Mr. Stephenson	3 gs.
Nuswith	chestnut	11	by Nuthall, out of Ramona, by Sultan	started 31, won	1	won	Newmarket St. Leger	unrtd.	unrtd.	—	—	Newmarket	Messrs. Barrow	6 sovs.
Oxford Blue	grey	7	by Robin Gray, out of Cora	started 7, won	2	won	St. Leger	unrtd.	unrtd.	—	—	Bargley, Stamford	Mr. H. Rose	50 sovs. (55 mares)
Philon	chestnut	10	by Volskyde, out of Queen of Carriages, by Voltire	started 15, won	5	won	£519 at Nawlesci	unrtd.	unrtd.	—	—	Sholey Bridge, Durham	Mr. Foster	5 sovs., h. b. 2 sovs.
Pollard	chestnut	14	by Beina, out of Lucretia, by Reveller	started 6, won	2	won	G. Duke Michael S	7	unrtd.	—	—	Bargley, Stamford	Mr. H. Rose	10 sovs.
Pompey	chestnut	10	by Beina, out of Quercus, by Cerberus	never appeared	—	—	—	—	—	—	Obleton, York-shire	—	2 sovs.	
Pompey	chestnut	14	by Beina, out of Veranda, by Bostard	started 85, won	10	won	Gl. York. Hand. (2)	4	unrtd.	—	—	Baron Poleswa, Hull	Mr. Baxter	10 gs.
Pottery	bay	10	by Touchstone, out of Charley, by Britain	never appeared	—	—	—	unrtd.	unrtd.	—	—	Great Driffield	Mr. Heyden	5 gs.
Porpoise	bay	10	by Prentissontary, out of Enterprise, by De-lancey	started 25, won	5	won	£80 at Newmarket	unrtd.	unrtd.	—	—	Wroughton, Swindon	Mr. H. Reeve	5 gs., h. b. 2 gs.
Porton	bay	11	by Touchstone, out of Lady Stafford, by Comus	started 6, won	2	won	Great Yorkshire S.	4	unrtd.	—	—	White Swan, York	Mr. S. Read	5 gs., h. b. 2 gs.
Porton George	bay	11	by Voltire, out of The Princess, by Sultan	never appeared	—	—	—	unrtd.	unrtd.	—	—	Derby	Mr. Penner	5 gs., h. b. 2 gs.

STALLIONS FOR THE SEASON 1854—(Continued).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performances.	No. of wins out of 14.	Site of	Standing at	Apply to	Price.
Pyrrhus the First	chestnut	11	by Epirus, out of Fortress, by Defence.	started 13, won 10	won the Derby	2	Village Lass	Willsten Padlocks, Mr. Phillips	16 gs.	
Ramadan	bay	17	by Beirum, dam by Reveller	started 6, won 1	won £50 at Newmarket.	—	—	Ray Horse, Solly	Mr. Markham	5 sovs., h. b. 2 sovs.
Ram	chestnut	13	by Buzzard, dam by Pezon	started 7, won 3	won the Criterion	4	Penang	Theobald's Farm, Enfield	Mr. A. Gray	11 gs.
Ravenstone	bay	8	by Venison, out of Spectum, by Rowton	started 1, never appeared	—	untrifd.	—	Theobald's Farm, Stock, Mr. Matthews	5 sovs.	
Red Deer	bay	13	by Venison, out of Soldier's Daughter, by The Colonel	by started 20, won 10	won Cleefer Cup	8	Tinid Fawn	Holly Bank, Baeton R. Kildale	10 gs.	
Retriever	chestnut	8	by Recovery, out of Trogioni, by Whisker	started 53, won 21	won Goodwood stakes.	11	Rememorator	Dunlinchill, Willesden, J. Bullock	5 gs.	
Roachster	black	8	by Chatham, out of The Margravine, by Little John	started 17, won 9	won £275 at Newmarket	1	Cyrus	Pountney, Bedford	Mr. Ward	6 gs., h. b. £3 5s.
Roland	bay	8	by The Sadler, out of Executrix, by Liverpool	started 15, won 2	won Wolverhampton S.	untrifd.	—	Royal Mews, Manchester	Mr. Ryder	6 gs., h. b. 3 gs.
Roseborough	chestnut	7	by Tearaway, out of Grainsick, by Sir Hercules	started 25, won 4	ran a dead heat for St. L.	untrifd.	—	Clifton, Nottingham	Mr. H. Neal	7 gs., h. b. 3 gs.
Sage's Boy	chestnut	22	by Defence, dam by Selim	never appeared	—	0	Agis	Wroughton, Swinton	Mr. H. Reeve	5 gs., h. b. 3 gs.
Saucy Boy	—	—	by Arthur, dam by Mandrake	by started 5, never appeared	won the Caen St. Chase	untrifd.	—	Willsten Padlocks	Mr. Phillips	5 gs., h. b. 3 gs.
Shaloh	brown	14	by Sheet Anchor, out of Nanette, by Partisan	started 5, never appeared	—	1	Tobolski	South Hatch, Epsom	5 2sa. h. b. half price.	
Sir Hercules	black	13	by Whitebone, out of Port, by Wanderer	started 14, won 7	won the Claret	91	Faugh-a-Ballagh	Bushbury, Wolverhampton	Mr. Phillips	11 sovs. (20 mares)
Star	bay	11	by Mellorine, dam by Margrave	started 12, won 4	won St. Lezer	2	Mr. Sykes	Theobald's Farm, Enfield	Mr. A. Gray	11 sovs.
Starbuck	bay	11	by Royal Oak, dam by Orville	started 18, won 7	won Newmarket St. L.	81	The Princess	Kewford, York	J. Bateson	15 sovs. (30 mares)
Spanish Jack	bay	11	by Don John, out of Miss Lydia, by Walton	started 21, won 14	won Newmarket St. Lezer	untrifd.	—	Kewmarket	Messrs Barrow	7 gs.
Star of Bura	chestnut	11	by Linnæus, out of Pess, by Tenters	started 3, won 1	won £70 at Newton	1	Donna	Clay Hill, Breckford	—	6 sovs., h. b. 3 gs.
Star of Buxton	brown	20	by Cannon, out of Dardanelles, by Anaxais	started 32, won 11	won Northumb. P. (2)	5	Kick-up-the-dust	Chapman, Co. Meath	—	3 sovs., h. b. 2 sovs
St. Patrick	bay	19	by St. Patrick, out of Surprise, by Sent	started 49, won 28	won the Ascot Cup	19	St. Osvall	Warrington, Knarbro	Mr. S. Waring	3 sovs., h. b. 2 2/3 gs.
St. Lawrence	brown	17	by Skyrock or Lapping, out of Helen, by Blacklock	started 53, won 28	won the Chester Cup	6	Surprise	Newmarket	Mr. R. G. Patten	10 gs.
Stone Plover	bay	4	by Codrington, out of The Wyebeck, by Shark	started 1, never appeared	—	untrifd.	—	Willsten Padlocks	Mr. Phillips	10 gs., h. b. 5 gs.
Storn	bay	6	by Touchstone, out of Glauzette, by Pantaloon	started 2, won 1	won £400 at Doncaster.	untrifd.	—	Stamett, Henley-on-Thames	Mr. Hussey	7 gs., h. b. 3 gs.
Surplice	brown	12	by Touchstone, out of Cenciaria, by Priam	started 16, won 9	won the Derby	untrifd.	—	Thames	—	30 gs. (40 mares)
Sweetwater	brown	12	by Gladwin, out of Polly, by Starbuck	started 24, won 12	won Queen's Vase	13	Trile	Port Tavern, Doncaster	—	30 sovs.
Teddington	chestnut	6	by Cannon, out of Miss Fritchingham, by St. Giles	started 15, won 19	won the Derby	untrifd.	—	Northampton	Mr. Lawrester	30 sovs. (20 mares)
Theon	brown	17	by Emiline, out of Maria, by Whisker	started 6, won 3	won Doncaster Two-yr. S.	15	Alcoran	Theobald's Farm, Enfield	Mr. Gray	10 gs.
Touchstone	brown	23	by Canal, out of Bunter, by Master Henry	started 21, won 16	won St. Lezer	untrifd.	—	Meatmore, Leighton Buzzard	S. Fountain	10 gs.
Touchstone (Vg.)	brown	4	by Touchstone, dam by Discount	started 5, never appeared	—	120	Surplice	Buzard, Chester	—	30 sovs.
Tudinter	bay	10	by Racecatcher, out of Sovereign, by Orville	started 24, won 10	won Aukley End S.	untrifd.	—	Hatfield, Cheshamsteadon	Mr. Harper	7 gs., h. b. 3 gs.
Taurus	bay	8	by Taurus, out of Maria, by Vireley	started 2, won 3	won Chesterfield Cup	untrifd.	—	Cheseldene, Swinton	Mr. King	4 sovs., h. b. 2 sovs.
Taurus (Young)	bay	7	by Venus, out of Charles, by Defence	started 27, won 11	won Newmarket S.	untrifd.	—	Croston Park, St. Neots	Mr. Brovne	7 sovs., h. b. 2 1/2 gs.
Tortoise	bay	2	by Venus, out of Glee, by Langer	started 2, won 1	won £250 at Northampton	untrifd.	—	Knoekhill, Epselchield	Mr. Monzes	7 sovs., h. b. 2 1/2 gs.
Tortoise (Young)	brown	2	by Voltare, out of Glee, by Langer	started 11, won 5	won the Derby	untrifd.	—	Wheaton, Leeds	Mr. Dovnes	3 sovs., h. b. 2 1/2 gs.
Tortex	brown	2	by Voltare, out of Martha Lynn, by Nulatio	started 3, never appeared	—	untrifd.	—	Madbury, York	Mr. S. Boone	12 sovs.
Turkey	bay	6	by Voltare, out of Martha Lynn, by Nulatio	started 3, never appeared	—	untrifd.	—	Port Tavern, Doncaster	Mr. R. Daykins	12 sovs. (35 mares)
Variawick	bay	12	by Epirus, out of Valentine, by Voltare	started 8, won 3	won Four-year-old S.	untrifd.	—	Dongate, Northampton	Mr. Sanders	Through b. 10/10s.
Weatherbit	brown	5	by Sheet Anchor, out of Miss Letty, by Priam	started 37, won 12	won Cesarewitch Stakes.	untrifd.	—	Bedford Stables, Newmarket	Mr. Bullt	10 sovs.
Weatheridge	bay	5	by Weatherbit, out of Taurina, by Taurus	started 37, won 12	won Cesarewitch Stakes.	untrifd.	—	Madde Park, Egham	P. Bass	10 gs., h. b. 3 gs.
Willsten	bay	5	by Elis, out of Spring, by Whisker	started 13, won 2	won Goodwood Stakes	untrifd.	—	Sevenhampton, Andover	—	10 gs.
Windbound	bay	7	by Pantaloon, out of Phyrne, by Touchstone	started 13, won 7	won £74 at Reading	untrifd.	—	Wotton, Harrogate	Mr. Groves	4 sovs., h. b. 2 sovs.
Windchurn	bay	12	by Deputy Paddy, out of Medea, by Whisker	started 17, won 2	won Ascot Cup	untrifd.	—	Wotton, Northampton	—	10 gs.
Wood-Pigeon	bay	17	by Teopetec, out of Anna, by Sultan	started 43, won 18	won Ascot Cup	untrifd.	—	Barguey, Stamford	Mr. H. Rose	5 sovs., h. b. 2 sovs.
Woolley	chestnut	92	by Chatham, out of Clean-up, by Arcon	started 43, won 18	won Ascot Cup	untrifd.	—	Woolley, Stamford	Mr. King	10 gs.
Waxley	bay	17	by Blacklock, out of Dolandus, by Sedm	started 4, never appeared	—	3	Garforth	Sheff. Babour	Mr. Wright	5 gs., h. b. £1 15s.
Young Physician	bay	17	by Physician, out of Snow-Pie, by Southstar	started 4, never appeared	—	3	Green Dragon	Wotton, Harrogate	Mr. Ellington	5 gs., h. b. 2 gs.

ROYAL DUBLIN SOCIETY'S SPRING CATTLE SHOW.

The Royal Dublin Society held their usual Spring Show for cattle, sheep, horses, pigs, poultry, and implements, on the 18th, 19th, and 20th April last, on their premises, Kildare-street, and the portions of the Great Industrial Exhibition yet standing, which Mr. Dargan has, with his accustomed liberality, placed at the disposal of the Committee of Agriculture of the Royal Dublin Society; the great central hall being occupied by the implements, that to the south of it contained the finest collection of poultry yet exhibited, and the fine arts halls were occupied by neat cattle. In addition to the usual styes for pigs, a large number had to be located in the building, in the court-yard, lately occupied by implements; while the sheep were disposed of in suitable pens in the court-yard between the Society's house and Kildare-street.

The show, taken as a whole, has been the best that has yet been held in Ireland; and in the neat cattle classes the shorthorns were allowed by the best judges not to have been surpassed at any show in the sister countries; and if we may judge of the prices realized, and refused, in comparison with those obtained for shorthorns on the 13th inst., at Leaton, near Nottingham, at the sale of the fine herd of Mr. Wilkinson, who has devoted over forty years to breeding and improving shorthorns, the Irish blood now stands pre-eminent; although the Irish breeders have suffered a defeat by Mr. Towneley, for the second time, carrying off the *Irish Farmers' Gazette* Challenge Cup with his celebrated prize-taking shorthorned cow Butterfly, No. 205, which is indeed a noble animal, though in our opinion much too fat; her ribs can scarcely be felt; and behind the shoulders she feels so soft as to put aside all ideas of flesh. His cow, Alice, won the cup and all the honours last year. On the other hand, we find Mr. Strafford giving Mr. Chaloner, of Kingsfort, Moynalty, 150 guineas for his yearling short-horned bull, The Baron, No. 4, which took second prize, for an eminent English breeder, and buying the first-prize yearling bull, New Year's Day, No. 5, the property of T. Lee Norman, Esq., for an American Company, at a very high figure. John Farrell, Esq., of Moynalty, also sold his yearling bull, Sultan, No. 17, to the Honourable Mr. Wandesford, and his first-prize bull, Czar, 104, in division 2, to the Ohio Company, for 100 guineas each. Mr. Farrell is an old and experienced breeder, and the results are now bearing testimony to his judgment and selection. Thomas Ball, Esq., we understand, also sold his two-year-old bull at a high figure.

In the 1st Sec. there were highly commended—Richard Challoner, Esq., No. 3, for Cadet; Charles Towneley, Esq., No. 10, for Young Jupiter; John Farrell, Esq., Moynalty, No. 17, for Sultan; and R. S. Fetherstonhaugh, Esq., Rockview, Killucan, No. 52, for Lord Cosmo.

In the 2nd Sec. there were five animals highly commended, viz.—Thomas Lee Norman, Esq., No. 100, for Omar Pasha;

St. George Grey, Esq., Dorrington, No. 114, for Emigrant; T. H. Stanley McClintock, Esq., No. 122, for Bootes; Charles Powell Leslie, Esq., M.P., No. 123, for Midshipman; and Robert Maxwell, Esq., Croom, No. 125, for Jew's Eye.

In Division 3, Section 1, the Hon. L. H. K. Harman took the first prize and the Gold Medal, for Pat, No. 132, as the best of all the prize bulls, beating Mr. Towneley's bull Jasper, No. 135, although Jasper beat Pat at the Killarney show; and previous to that, Pat beat Jasper at the Gloucester show. Pat was purchased originally by Mr. Ganly, for the Hon. Mr. Harman. Besides the above, there were three highly commended in this section, viz., P. J. Kearney, Esq., for Prize Flower, No. 133; Francis Maurice, Esq., for Charleville, No. 134; and the Earl of Clancarty, for Nauncless, No. 139.

In Division 5, Mr. Towneley, for The Squire, No. 179, took first prize, the large Silver Medal, and another large Silver Medal as the second best bull exhibited; and William Owen, Esq., second prize for Gainford the Fourth, No. 185; for which he refused 150 guineas. In this section there were two high commendations, viz., A. F. Nugent, Esq., for Starlight, No. 175; and Lord Talbot de Malahide's celebrated Bull, Phoenix, No. 186, for which we heard a very large sum was refused.

Class 2, Sec. 1, stood Mr. Towneley's splendid cow, Butterfly, No. 205, which obtained the large silver medal as the best in this class, the gold medal as the best of all the milch cows, and the *Farmers' Gazette* Challenge Cup as the best breeding animal exhibited. The second prize was taken by Viscount Monck, No. 207, for Bonnet; and the third by Viscount Monck, No. 209, for Myrtle the Second. Mr. J. J. Turner, No. 195, for Grandiflora, and Mr. J. Hodson, 197, for Madame Grisi, were commended. In this section, also, Lord Monck obtained the gold medal for the best three cows the property of one exhibitor, viz., No. 207, for Bonnet; No. 208, for Baby; and No. 209, for Myrtle the Second. Here also stood the second prize three cows, belonging to Mr. John Christy: No. 191, Peach; No. 192, Queen of Beauty; No. 193, Damask—Queen of Beauty being also the winner of the Townley Cup.

In Class 3, Heifers, Division 1, Section 1, the prize was awarded to Rowland Campion, Esq., Oldtown, Shanballymore, for No. 250, White Purity, and the large silver medal as the second best of all the prize breeding heifers. Mr. Towneley highly commended for No. 245, Vestris, a beautiful heifer hitherto very successful. Division 2, Section 1, Mr. Towneley took the prize, and Gold Medal as the best of all the breeding heifers, for No. 274, Butterfly the Second, the daughter of the prize cow, Butterfly. He was commended for No. 275, Duchess the Second. Charles L. Ellison, Esq., No. 277, The Pride of Kildare, highly commended; and T. H. Stanley McClintock, No. 282, The Queen, commended.

Division 3, Section 1, Thomas Barnes, Esq., No. 294, The Baroness, first prize; for which he refused £200. Lord Cloudbrock, No. 286, Fancy, commended. Robert Maxwell, Esq., No. 287, Fair Lady. Richard Challoner, Esq., No. 288, Camellia; No. 293, Fanny Warlaby; No. 291, Rosetta; all highly commended. W. A. Barnes, Esq., No. 295, Modish, commended; and Lord Monck, No. 305, Myrtle the Fifth, commended, which was sold for 80 guineas.

In Division the Earl of Charlemont was, as usual, most suc-

cessful. In section 4, the first prize was taken by John Walsh, Esq., Balbriggan, with Roebuck, No. 150. In fat oxen, Hugh Barton, Esq., Straffan, was the most successful. We understand the weight of two of them was 23½ and 22 cwt. respectively.

The sheep were, in many instances, of real excellence. We missed some of the old exhibitors; but their places were well sustained by others, many sheep of purity of blood and first quality being exhibited, some of them being imported last year from the flocks of G. N. Panlett, Lord Polworth, R. W. Crewell, Esq.,—Abrams, Esq.,—Kingdom, Esq.,—Sanday, &c., England, and of J. J. Douglass, of Athelstanford, Scotland. Large prices were asked, and freely obtained, in this class. We learn that Wm. Owen, Esq., Blesinton, sold a Southdown hogget ram, one of the three prize hogget rams, never clipped (No. 434) for 20 guineas, and refused 30 guineas for his pure Leicester one shear ram, 370; he refused also 150 guineas for his short-horned bull, Gainford the Fourth, No. 185. In Cheviots the Marquis of Conyngham was very successful, taking all the prizes in this class, except that in section 3, which was awarded to Emerson Dawson, Esq., Annefield, near Hollymount, county Mayo.

In pigs, from the small porker to the large bacon pig, we had everything to be desired in size, carliness, aptitude to take on fat, and purity of breeding; so much so, that sporting prices were asked and readily obtained for numbers. Captain M'Clintock, Bunbury, disposed of five breeding pigs under ten months old, for which he obtained first and second prizes, £15 to £20 each, and refused £30 for one which he would not dispose of: they were fed on steamed mangels, turnips, and carrots, mixed with cracked, steeped Oats; and Mr. Robertson, steward to Mr. La Touche, of Harristown, sold a six-months-old boar for £12. Lord Monck obtained £10 each for his nine-months-old pigs, and five guineas for his young ones. Rev. J. Warburton, Alderman Roc, and others obtained large prices. In fowl there were 302 lots entered, embracing all the most approved and rare varieties, which presented the best array we have yet seen; they were most appropriately arranged at both sides of the hall, to the south of the great hall of the Great Exhibition Building, which was densely crowded each day during the show.

In implements we observed nothing new, but those exhibited were good and select. As we have so repeatedly reported on their merits on former occasions, and, recently, in the reports of the Great Industrial Exhibition, it would be but tiresome repetition doing so now. However, among the lot we observed a very large supply of Long's sheep-dressing mixture; and also, in the court-yard, where Mr. Long in person, with

his London and Dublin agents, Messrs. Barry and Wight, and his dresser, attended. This day two large flocks—one in the neighbourhood of Bray, the other in that of Enniskerry—are to be dressed under their personal superintendance, which, as a matter of course, will be reported, for the information of all flockmasters as soon as the result can be ascertained.

The judges had an arduous task, and were most painstaking, having been incessantly employed from six o'clock in the morning till considerably past that hour in the evening, and, as far as we have yet heard, gave universal satisfaction in the several classes of cattle, sheep, and swine; but we consider it would be a better arrangement to have separate sets of judges to adjudicate on the important classes, or one set for the short-horns, and another for the other classes, as the entire are becoming so numerous that it will be impossible for one set to accomplish all.

At eight o'clock on the evening of Tuesday there was the usual meeting of the members of the society, presided over by his Excellency the Lord Lieutenant, when the prizes were read by the secretary, Dr. Steele.

We have learned that upwards of 12,000 persons visited the exhibition on Wednesday and Thursday.

The proceedings of the show terminated with an auction of the stock, conducted by Messrs. Ganly and Sons. We heartily congratulate the breeders on the prices they obtained during the show, and trust that the encouragement they have received will stimulate them to make, if possible, greater efforts for next year's meeting.

JUDGES.

BREEDING STOCK.—John Wright, Esq., Chesterfield; Henry Smith, Esq., Drax Abbey, Yorkshire; William Hunt, Esq., Wortley, Yorkshire. Steward—Robert Collins, Esq., M.D.

FAT STOCK.—Richard Chaloner, Esq.; Robert Holmes, Esq.; Robert Archbold, Esq. Steward—R. C. Wade, Esq.

SHEEP.—Robert Holmes, Esq.; P. Tomalin, Esq.; Wm. Torr, Esq., Aylesbury Manor, Lincoln. Steward—R. C. Wade, Esq.

SWINE.—Capt. Arbutnot; Wm. Owen, Esq.; Geo. Hill, Esq. Steward—Thos. Rutherford, Esq.

POULTRY.—J. M. D'Olier, jun., Esq.; Arthur Haffield, Esq.; Richard Chaloner, Esq.; Captain Croker. Steward—John Toller, Esq., M.B.

HORSES.—Captain Croker; Captain Arbutnot; Edward Dycer, Esq. Steward—R. C. Wade, Esq.

IMPLEMENTS.—John G. Adair, Esq.; W. B. Webster, Esq.; R. H. Wade, Esq.; Arthur Huband, Esq.

Andrew Corrigan, Superintendent.

DAIRY MANAGEMENT. — CHEESE.

The scientific principles involved in the important manufacture of cheese are very little known. Milk contains about four-and-a-half per cent. of caseine, which is the principal ingredient of cheese. This caseine is almost exactly of the same composition as animal flesh. It is held in solution in the milk by means of an alkali. Any acid which removes this alkali converts the caseine into an insoluble curd, which, when collected and dried, forms cheese. Muriatic acid is used for this purpose in some parts of Holland; vinegar, tartaric acid, cream of tartar, and even some of the salts of oxalic acid, such as salt of sorrel, are employed in various countries. The

acid formed when milk becomes sour also produces the same effect, so that sour milk is used instead of rennet in some parts of Switzerland. All these additions are for the express object of making an insoluble curd, by removing the alkaline solvent of the cheese. This insolubility may also be produced indirectly as well as directly. Various substances have the property of forming an acid in the milk itself (lactic acid), which, removing the solvent of the caseine, causes the proper formation of a curd; for most kinds of cheese this indirect action is preferred. In other countries, the coagulation or curdling is effected by various means, as

by the juice of figs or thistles, or by decoctions of the flowers of the artichoke, of the crow-foot, and of the white and yellow bed-straw. A peculiar stringy curdling is obtained by the juice of the butterwort (*Pinguicula vulgaris*). But in this country it is usual to depend on the peculiar action of the rennet. The stomach or intestines of young animals, especially of the sucking calf, pig, lamb, or kid, have been found to possess this indirect action. Little is known as to the exact chemical processes which ensue when rennet is added to milk. All, in fact, known is, that the stomach, dried and prepared as rennet, must be in a state in which it may decay, but not rapidly enough to run into putrefaction. The active principles of the rennet are certainly substances in the act of decay, and its peculiar value is, that it can be preserved without losing this power, which, though in abeyance, may be called into activity when desired. The processes used in preparing the rennet—such as salting, smoking, treatment with salt, lemon-juice, and spices—have for their object the prevention of putrefaction, and the repression of decay. A certain amount of decay is necessary; and, for this reason, Rennets are preferred in most districts when they have become somewhat aged by keeping. The active changing principles are soluble, and, therefore, may be extracted by water, and used directly for the curdling of the milk; or the rennet itself being added to the milk, gives out its soluble ingredients to that fluid. A further decay of the exhausted rennet produces more of the transforming materials, and restores it to its active state, so that it may be used over and over again. Chemists at present know the fact, without having ascertained its cause, that decaying substances, such as putrid flesh and sour milk, produce a change in fresh milk, forming, among other substances, various acids which effect its curdling.

Prepared rennet is a means of effecting this change in a regulated manner, and without the production of those offensive substances formed during the putrefaction of milk. It is by the communication of the decay of rennet to the milk—just as a decayed apple causes decay in a fresh apple in contact with it—that this change is effected, and not by the addition of any peculiar substance; for it has been found by experiment (Berzelius) that one part of rennet, which had curdled 1,800 times its own weight of milk, had decreased in weight only 0.06. This view is obviously correct, when it is considered that one square inch of good rennet can curdle 80 quarts of milk, or that one spoonful of its infusion produces the same effect on 120 quarts. The action finds its parallel in that of yeast on sugar. In this case, a very small quantity produces the alcoholic fermentation on an immense amount of the saccharine fluid. There can be little doubt that the manner of preserving the rennet produces a very great effect on the qualities of the cheese produced. It is much more probable that the different kinds of decay caused by Rennets differently prepared, have much more influence on the character of the cheeses of a district than any deviations in climate or in pasture. As the cheeses of commerce do not consist simply of caseine, but also contain butter and other ingredients of the milk in small proportion, it is obvious

that the qualities of cheeses must depend much on those of the milk itself. The milk of cows, goats, and ewes, has very different compositions and properties; and cheeses made from them differ also very materially. Minor differences in the milk of the same animal also produce notable variations in the cheese of different districts, even though apparently the same materials are used in their preparation. The differences are, of course, much increased according to the practices of districts, of adding or subtracting cream from the milk used. The former method gives the rich Stilton cheese, while the removal of all cream yields the poor horny cheeses of Essex and Sussex. The use of whole milk produces such cheeses as those of Gloucester, Cheshire, Wiltshire, Cheddar, Dunlop, and the Gouda of Holland. The common Dutch cheeses are usually obtained from once-skimmed milk, so that they still contain butter, but less than the varieties just named.

In the preparation of cheese the application of heat to the milk is useful, by hastening the chemical action, and by enabling the whey to separate more readily, and yield its butter to the curd. The more or less complete separation from the whey has an influence, not only on their taste and power of keeping, but also on the flavour which the cheese acquires by age. The alterations resulting from curing, and from the time required for ripening the cheese, have not yet been sufficiently investigated to be explained on scientific principles, although chemists have recognised various bodies as the result of these changes. The pungent smell and taste are obviously due to the volatile acids in butter, though, doubtless, other unknown bodies contribute their part in the production. Valerianic acid, and a crystalline substance called leucin—ammonia, partly combined with caseine and partly as salts—have also been detected. All these ingredients exert an important influence in giving character and flavour to cheese. The caseous ingredient of milk is not confined to that fluid, but exists even more abundantly in peas and other leguminous seeds. But the absence of butter, and the difficulty of forming artificially the due proportion of these and other accidental ingredients, have prevented the application to other powers of caseine for the purpose of cheese making. Several kinds of cheese have been analyzed by Mr. Jones, in Professor Johnston's laboratory, with the following results:—

	Water.	Caseine.	Fat.	Ash.
Skim milk cheese, made June, 1845, analyzed June, 1846..	43.82	45.04	5.98	5.13
Double Gloucester cheese, made June, 1845, analyzed June, 1846	35.81	37.96	21.97	4.25
North Wilts cheese, made June, 1845, analyzed June, 1846..	35.58	25.00	30.11	6.29
North Wilts cheese, made Sept., 1845, analyzed Sept., 1846..	36.34	31.12	28.09	4.41
Dunlop cheese, made in 1845, analyzed in 1846	38.46	25.87	31.86	8.81
"Lanarkshire Brick," made June, 1846, analyzed July, 1846	41.55	28.84	20.60	2.78
North Wilts cheese, made July, 1846, analyzed Sept., 1846..	40.58	28.25	27.44	3.73
North Wilts cheese, made May, 1846, analyzed Sept., 1846..	44.80	28.16	23.04	3.09
Cheddar cheese, made in 1845, analyzed in 1847.....	36.04	28.98	50.40	4.58

It will be seen from the foregoing analyses that cheese is an exceedingly nutritious substance, standing considerably higher in this respect than butchers' meat. Dividing the constituents into the principal nutritive groups, cheese is composed as follows:—

Flesh-forming substances	31.02
Heat-giving substances	25.30
Mineral matter	4.90
Water	38.78
	100.00

The cows are milked twice a day—at 5 A.M. and at 5 P.M. The cheese being always made in the morning, the evening's milk is poured into basins, or coolers, and stands over them. It is then skimmed, to remove the cream; and a portion of it, about one-half, is warmed in a flat-bottomed, shallow pan, to about 100 degs., and then poured into the cheese tub, along with the morning's milk, and that portion of the evening's milk not warmed. The cream, mixed with a little warm milk, is now added, and the temperature of the whole being somewhere between 80 and 85 degs., the rennet and colouring are also added, and well stirred and mixed with the milk. The annatto, or colouring matter used in the preparation of Cheshire and other cheeses, is added to the milk before the rennet. Mr. White states that half an ounce to above seventy-five pounds of cheese is a sufficient quantity; and that it is commonly dissolved in a pint of warm milk on the previous night, for addition to the bulk in the morning. After the addition of the rennet, the tub is covered carefully up for an hour, by which time, under ordinary circumstances, coagulation will begin, and in fifteen minutes more be completed. The curd is now broken; which, for a sixty pounds' cheese, takes about twenty minutes, and then allowed to rest fifteen minutes, to separate from the whey. The whey on the top is removed by pressing down a flat-bottomed pan gently on the curd, and allowing it to fill. The whey is poured into the *set* pan from the cheese tub. The curd, so far freed from the whey, is again broken by the "breaker," or very gently by the hand, and again allowed to settle and separate. In about half an hour the whey is baled out, and, as the curd gets more and more solid, it is drawn to one side of the tub. When this has been accomplished, and the free whey all removed, a semicircular perforated board, made to fit one-half of the tub, is placed upon the curd, and pressed down with a thirty pounds weight, which gently squeezes out the whey. This whey is poured through a sieve into the *set* pan, to detain the particles of curd floating in it. The weight is now removed, and the curd cut in pieces six or eight inches square. The board and a weight, double the last, are again applied. More whey is pressed out, and when this has been repeated once or twice with heavier weights, according as the condition of the curd requires, the curd is ready for being put into the cheese vat.

PRESSING.

Before placing the curd into the first or large cheese vat, a willow basket is sometimes used; the curd is cut into smaller square pieces than before, and gently broken

by the hand in the act of putting it in. When put in the vat, which it should not quite fill, it is covered with a close-fitting board, and placed under a light and continuous pressure. When the whey ceases to drain from the sides of the vat, the curd is taken out, and broken as before. The curd is now put into the proper cheese vat; but before this a cheese-cloth is placed in the vat. After the curd is all in, the ends of the cloth are tucked over it, then covered with the circular board ("sinker"), and placed under heavier pressure than before. To assist the discharge of the whey, iron skewers are thrust through the vat holes into the cheese, and, after a few minutes, withdrawn, when the whey follows. When the whey has ceased to follow the skewers, on being withdrawn, the vat is taken out; the curd, still in it, is cut into sections, every two or three inches, with a dull-edged knife, and again pressed and skewered, as before, for a quarter of an hour or twenty minutes. After this, the curd is taken entirely out of the vat, cut into large pieces, each of which is broken by the hand, then placed in a dry cloth in the vat, and covered, pressed, and skewered; which is again repeated, until the whey is nearly all extracted. These operations, from the time of coagulation, will consume about five or six hours, by which time the curd should be sufficiently dry for being salted.

The best tests of complete coagulation, according to Mr. White, on whose authority many of the above remarks are made, are the firmness of the surface of the curd when pressed by the hand, or skimming dish, and the pale-green colour of the whey.

SALTING.

The curd, being now comparatively free from whey, is taken out of the vat, cut into pieces, and crumbled down with the hands; or, what is better, by passing it through the curd mill. The salt, at the rate of 1lb. to 46lbs. of curd, is then intimately mixed with it. The salted curd is again returned to the vat in a dry cloth, of finer texture than before; and, in order that it may be pressed properly, it should more than fill the vat. A tin hoop is put round that part of the cheese which projects from the vat, the lower edge being within the vat, and sinking along with it when put under the press. The pressure is now considerably increased, and the skewering continued. In an hour the cheese, now completely formed, is taken out, its edges pared—the parings being put into a hole on the top, scooped out for the purpose—inverted, and put into the vat, a dry cloth being previously placed on it, and again subjected to heavier pressure. Some time during the evening the cheese is again turned, and receives a dry cloth which terminates the first day's operations. On the second day it is turned twice or thrice, dry cloths given, and the skewering continued. On the third, this turning and dry cloths are twice repeated, but the skewering is discontinued. This usually completes the process of making; but some continue the pressure for another day. External salting is more practised in Cheshire than salting the broken curd.

—*Cyclopædia of Agriculture.*

THE SEASON VERSUS SCOTCH BEEF.

In Smithfield, and also our butcher's shop, our ears have oftener than once been assailed with the interrogatory "What's the reason why Scots don't cut up well this year—less by a stone and upwards per quarter?" Some of our readers may think that a question so simple as this might easily have been settled in the latter place; but not so, for the butcher's own answer, "Short-keep, suppose," only gave rise to another, "Dear corn," on our part, *ad infinitum* almost. Indeed, the question cannot be satisfactorily answered at this end, for the golden maxim of "Science and practice" demands the feeling-box and slaughter-house both to be involved.

To trace our beef-steaks and mutton-chops to the source where they were grown, in order to account for the differences at issue, would be no less an interesting than useful undertaking—one, however, which we must at present forego; at the same time, the topic of little weight cannot be so easily passed over, for it affects the public interest daily, were our butcher and ourselves to be silent as to our own peculiar circumstances.

The butcher's loss is, perhaps, not the least important view of the subject, either to growers or consumers; for if he purchases four or five Scots weekly, to supply a special class of customers, and loses from twenty to forty shillings per head—or gets that sum less for them than he calculated, which is the same thing—he very naturally bears it in remembrance when he again returns to Smithfield; so that the question arises, does he succeed in pulling down the salesmen to this amount? or is the loss divided between growers and consumers? or has he to submit to the greater part of it himself?

That the butcher sustains the first loss, and that he fails to reimburse it again, is more than probable; so that the best market-men share with the farmer and public, thus far, supposing the latter afterwards sustain the whole; while some may never be able to "err on the safe side" for themselves, but the principal loss must obviously recoil back upon the feeder eventually, for the butcher's interest is not only to take care of himself, but also his customers; necessity compelling him to do so, owing to competition in trade, and the independence of those who consume the best quality of Scotch beef.

It is no easy matter, however, performing one's duty in the case at issue, in the overcrowded and uproarious turmoil of Smithfield; for the bullock looks and handles as fat and promising as usual, and yet turns out some eight to fourteen pounds less weight per quarter, while the quality also falls short. Under such circumstances, how is the practical man to be guided, when experience fails him thus? There is only one way of it, we presume—"the school of practice," where we are met on the very threshold with the vexatious question of an "apprentice fee." The butcher not only therefore sustains one loss, but several, probably before he suspects the veracity of his experience. Before he blames

his hands, he will accuse his head. When the balance, for instance, informs him of short weight, his first conclusion will be—"cheated;" and hence when he returns to Smithfield, his hands will be more than doubly on the look-out, so to speak. But the salesman, a practical man like himself, and as ignorant of the facts of the case as he, holds to the old weight, which he, an acknowledged purchaser of talent, sees no reason to object to, and therefore strikes a bargain accordingly. Practical men are not very easily turned out of the beaten track in which they are accustomed to move; and although previous experience may have taught the butcher similar lessons, a third and fourth experiment may yet be necessary to enable him to keep out of harm's way, so as to discharge his obligations to his customers and himself, and convince the salesman at the same time.

It will readily be perceived that the question at issue is not one that hinges upon half-fat, or any perceptible degree of fatness, for all shades of condition are affected; the full fat being deficient of weight, as well as beasts of inferior quality; for in Smithfield there are purchasers for all degrees of fatness, while the complaint among them is general as to loss. There are, no doubt, a greater number of half-fed animals being turned out this year than usual in some provinces; but such are not strangers in Smithfield so as to impose upon any one, for every season has more than a fair share of stock of this kind. With such, butchers are familiar; and if they purchase at too high a figure, they have only themselves to blame. It is otherwise with many Scotch-fed bullocks this year; for the best judge can hardly with safety say if he has got the worth of his money or no. A hundred Scots, for example, may be standing at the rail, out of which he may choose five of a quality to suit his customers; nineteen other butchers may follow, each making his own choice, and that differently from the others. The lot may be examined with the same care as usual; but when slaughtered and sold, a loss of from £100 to £200 has been sustained in the gross—a result of a nature which never fails to convince practical men, however prone they may be to cling to antiquated habits, that a change must be made some how or other. There is, perhaps, no class connected with the commercial interest, more disposed to plod onwards in the footsteps of the past than butchers, and yet more necessitated to listen to the voice of their balance sheet—circumstances easily accounted for; for the prejudices and demands of their customers are of a nature such as almost to forbid change; while weekly cash purchases of an expensive and perishable article demand the closest attention to results of this kind, and the causes which give rise to them.

We have been taking it for granted that our readers are familiar with the fact that certain breeds and beasts weigh better than others, handle and appearance being

equal, comparatively speaking: butchers are so. They are familiar with the fact, for example, that Scots "cut out well;" and the question which we now have to entertain is, the reason why they do not cut out so well as usual this year, and how butchers are to distinguish the difference in Smithfield. If they adopt the maxim of deducting £2 per head, it is manifest that some feeders will lose by it; and if, on the other hand, they do not, then either they themselves and the public must lose, or else they must be able to distinguish those which cut up as usual from those which do not.

The causes which bear upon the question at issue are so many, that we shall fall a long way short of being able to enumerate them, much less take them up in detail. The first deserving of special notice is the improvement of breeds and management by art.

There cannot be a doubt but that the improvement and distribution of shorthorns and other breeds, and the assimilation of provincial modes of management to a uniform practice of house-feeding on mixed food, have a tendency to do away with those differences in question, relative to the extra and deficient weight of cattle. At the same time, we are told by some of the best judges of Smithfield that Scots fed in Norfolk will not cut out so well, to appearance and handle, as they would have done had they been fed on "Don-side" Ythan, or Deveron, in Aberdeenshire, under similar circumstances as to food and household accommodation, and that "ditto, ditto," may also be said of shorthorns. Such being the facts of the case, the question, it will be perceived, has still two sides—*viz.*, Have breeds and management in Aberdeenshire been assimilated generally to those of the south, so as to produce the effect in question? or must this year only be taken as an exception for this purpose? while a third may be raised—Are the joint agencies of both involved?

It would neither be a very short nor easy matter to dispose of the details of these three questions satisfactorily. If it be admitted as fact that by improving our breeds we are deteriorating the quality of butcher-meat, then it can hardly be denied that in Aberdeenshire very important changes are being effected bearing upon the question at issue; for probably in no county of the north has art made greater progress in breeding and feeding than in it; so that, for a series of years past, the quality of Scotch meat may have been approaching nearer and nearer to that of English, although butchers have only made the discovery this year.

The exception taken to this conclusion by the second question, or opposite theory, is this—that if meat, under the old system of management, was superior in Aberdeenshire to that in the south, owing to natural circumstances over which art has exercised no control, and that progress in other respects has been equal, it consequently follows that difference of quality remains the same, on the plea that "equals added to equals, and the sums are equals." In other words, the cause is a natural one peculiar to the season.

It was rather shrewdly stated, some time during last summer, in support of this theory, that Aberdeenshire was enjoying an Essex climate, and on that account might

grow a Tiptree crop of turnips; and this may be taken as a natural cause for the difference of weight, for Tiptree turnips, given to feeding stock in the north, may be said to produce Essex beef. We are not saying that such is the cause; yet the difference in the quantity and quality of this root, which now forms such a large portion of the food of feeding stock in Aberdeenshire and our northern provinces generally, must necessarily exercise a very important influence upon both the quantity and quality of butcher-meat. It may change, for instance, not only the quantity and quality of both muscle and fat, but also their solidity. If the quantity of fat is less, and that of blood and lymph contained in the muscles just so much greater, then the depreciation of weight is easily accounted for; as, if such is the condition of the ox in Smithfield, it is manifest that the waste upon it subsequently must be greater up to the time it is slaughtered and sold—indeed, up to the time the four quarters are cooked and placed upon the dinner-table. In the first place, between the market and slaughterhouse, the lymphatics will be more disposed to evacuate their contents than if less filled. In other words, the amount of urine and perspiration will be greater. The excess of blood, again, will be removed in the slaughtering; while the amount of evaporation will be greater than from a different quality of meat. Adding these things together, therefore, it is easily accounting for a loss of from 8 to 14lbs. per quarter more than usual.

In many cases, again, the high price of corn may induce feeders to give less of it than usual; a change which would produce a similar result to what we have noticed above as to the quality of the meat from a slight difference in proportion of solids and liquids in the living organism—a difference of from four to eight Smithfield stones; and this may take place partly in the hands of the butcher as well as those of the farmer. From time immemorial, for instance, feeders have been familiar with the fact that a supply of corn immediately prior to being slaughtered very much improves the quality of the meat, making it not only more solid, but better flavoured. Into the rationale of this, therefore, we need not enter.

The stomachs, &c., of cattle are as dissimilar as those of man; and many animals cannot work up successfully an extra allowance of oilcake into fat. In such cases their fat is oily, and even watery and soft, never mixing so well with muscle, in which instance there is a larger waste upon it in a twofold manner—(1). During life it is less healthy and more burdensome, as it were, to carry, from its fluid character giving rise to nervous irritability, and consequent waste passing off both in the insensible perspiration and urine, partly in a gaseous and watery form, as well as from an increased respiration. (2). When slaughtered the waste is greater upon it both in the shape of offal and evaporation. It neither stands up to the knife, nor weighs well when put into the scales, being little better than an incoherent frothy mass of bubble. Now this year more oilcake may possibly be used to make up for the deficiency of corn and turnips, and therefore may be the cause in question.

A difference of health may also be the cause, arising from a combination of the preceding causes, but terminating differently. Nature having deviated from her usual path, has placed the animal in an unusual, or, we may say, artificial state, in which the different functions of life are more susceptible of injury during marketing. If the system, for instance, is in a plethoric state, and not only surcharged with a redundancy of blood, but the whole fluids containing an excess of watery and albuminous matter ("foul blooded"), then the animal will be more subject to catarrhal and pulmonary affections, derangement of the stomach and bowels, and the suppression of the functions of the secretory apparatus of the skin, with their consequents—fever and loss of weight during marketing. Now the severity of the season has been very much calculated to produce maladies of this kind; for the ox, in the condition under question, is more liable to be over-heated in driving to the railway, and afterwards to suffer from cold. By the time it gets to Smithfield, it will either be "knocked up" or about to recover by *resolution*. The latter is probably the more general termination of inflammatory affections of this kind, consequently a loss of 14lbs. per quarter is very easily accounted for; for in this case they are carried off in some very conspicuous evacuation, as an extra flow of urine, diarrhoea, &c., &c., between Smithfield and the slaughter-house, of which the butcher may be entirely unconscious.

A difference in the treatment during marketing, and

subsequently until slaughtered, would also very soon dissipate, in the shape of carbon and water, from four to eight Smithfield stones of fat from the four-quarters. We are not aware that anything of this kind has occurred. Smithfield is, no doubt, annually becoming more and more crowded; and the same may be said of the thoroughfares or streets in driving home. And although these must exercise a material influence upon weight, they are yet hardly sufficient to account for the above depreciation; at the same time, they must not be lost sight of in the question at issue.

It will thus be perceived that the salesman and butcher have more directions than one to look for the cause of the calamity at issue, and that to do justice to all parties is a task not very easily performed, where cattle cannot be properly handled and examined; for, although the complaint of "light weight" is levelled against Scots generally, there are obviously many whole provinces almost exceptions from it. Indeed we suspect that in reality it is the exception when applied to Scotch markets generally, and not more than the rule in the metropolis itself, if so much. At the same time it may be a fortunate one for purchasers, so to speak, in certain cases—one among many others which proves the necessity of farmers at the other end being more frequently the correspondents of agricultural journals and newspapers than they now are, in order that the facts of the case may be thoroughly investigated so as to obviate the evils complained of, for their interest is in more danger than that of consumers.

THE LENTON SALE OF SHORT-HORNS.

The sale of the stock of that old and highly respected breeder of short-horns, Mr. Wilkinson, took place at Lenton, near Nottingham, on Thursday, April 13, at 2 o'clock P.M., under the auspices of Mr. Strafford, the eminent auctioneer of live stock, from London. The interest excited in agricultural circles by the announcement of this sale had attracted a very large attendance of gentlemen from all parts of the country, including the principal short-horned breeders of Aberdeenshire, the representatives of the holders of fine stock in Ireland, and some of the gentlemen who have lately been active in purchasing short-horns for America. Among the company present, which in point of brilliancy was equal to the great sale at Earl Ducie's, and perhaps of any agricultural turn-out of recent date, with the exception of Mr. Bates's sale at Kirklevington, we observed:—"Sir John Crewe, Derbyshire; Messrs. R. Booth, Warlaby; A. Cruickshank, of Sittyton, Aberdeen; Dr. Watts and Mr. Waddle, Ohio; Messrs. Wetherell, Durham; Spearman, of Newton Hall, Durham; J. S. Crawley, Stockwood Park, Beds; Capt. Devaux, Drakelow Hall, Burton-on-Trent; Messrs. W. Smith, West Raisin; H. Smith, Cropwell Butler; W. Sanday, Holme-Pierrepont; J. Buckley, Normanston; Parr, Gotham; Parr, Cotgrave; Booth, Cotham; J. C. Adkins, Warwickshire; Biddle, Walton, near Warwick; Lynn, of Stroxtou, near Grantham; Kirkham, Lincolnshire; Dawber, of Keal Hall, Spilsby; Dudding, of Pantou; Hutton, Gate Burton, Gainsboro'; P. Pym, The Hasels, Beds; Hutchinson, of Nottingham; H. Anbler, Watkinson Hall, near Halifax, Yorkshire; Henry Smith, Drax Abbey, Yorkshire; Thos. Potter,

Swansea; R. Goodwin, Gamston; James Musson, of Hosc; Edward Smith, Radcliffe-on-Trent; Joshua Mann, of Straggle; Thorpe; Henry Mann, Yorkshire; John and H. Godber, Hue; Willoughby Wood, Hollybank House, near Lichfield; B. Swaffield of Chatsworth; J. Hemsley, Shelton; William Bryans, of Six Hills; Hart Buck, Thrusington; Geo. Goodwin, of Langar; John Burgess; Fisher, Orston; T. Hole, Cauntou; John Marshall, Stoke; John Marshall, Cotgrave; Sergeant Lowe; H. Maltby; Gill Wilson; J. S. Sherwin, of Bramcote; John Swann, of Odston Hill; Wm. Terr, of Aylesby; John Lowe, of Gamston; Streets, of Saadiaere; H. Marshall, Cotgrave; Parker, Oxtou; Robert Lowe, Doddington; Pearson, Chilwell; Lacy, Adbolton; J. Marriott, Cropwell Butler; Rev. John Burnside, Plumpton; Messrs. Watson, Londonthorpe; J. G. Dickson, Lincolnshire; Lovell Cowley, Northamptonshire; Shaw, Old Hall, Fradley, Lichfield; Yates, Colston, Rugeley, Staffordshire; E. Nichols, Hamley House, ditto; George Wallace, Balley-horscy, county Wicklow, Ireland; Gorman, Measham Lodge, Atherstone; John Smith, Marton Lodge, Bridlington, Yorkshire; Francis Jordan, Eastburn, Driffield; E. Swinerton, Newton Lodge; Percy, Nottingham; Rev. J. W. Butler, ditto; Messrs. Sherbrooke, Oxtou; Smith, Wilford; Rev. Mr. Dykes; Messrs. Maltby, Stringer, Derby; Bowker, Nottingham; Aule, Grantham; Potter, Woodhouse Hill Farm, Derby; J. Flower, Wheathill, Mackerworth; W. Everitt, Boothby Graffoe, near Lincoln; Marriott, Bleasby; Bland, Flamborough; Fletcher, Radmanthwaite; M. Hawkes, Not-

tingham; Smart, Normanton; A. Pyatt, Nottingham; Lancashire, Long Eaton; Wm. Morris, Cotgrave; Fillingham, Spyerston; John Morley; Isaac Grammon, Greasley Castle; J. Hall, Kiveton Park, Worksop; T. C. Beasley, Harstone, Grantham; H. W. Beauford, Bedford; R. Eastwood, Towneley Park, Burnley; T. Ivens, Lutterworth; J. Wells, Drakelow; — Burt, Welbourn; W. Brandham, Dringhoe, near Driffild; — Chambers, Stragglethorp; T. Morris, Maismore, Gloster. Agents: Messrs. Cattle, of Duke of Rutland; W. Wein, of the Duke of Marlborough; Robinson, of Earl Ducie; Woods, of Lord Walsingham; Woods, of Mr. Foljambe; T. Savage, of Earl Howe; Palmer, of Sir John Crewe; Govan, Michael Best, M.P.; John Hemsley, of Shelton; John Book, Kirbell, of Sir Richard Sutton; Heming, of the Duke of Newcastle, &c., &c.

Luncheon was provided by Mr. Mee, Assembly Rooms, Nottingham, for relays of about 100 each, admitted by ticket, the first of which sat down at 12 o'clock.

Early in the morning the courts and cattle sheds of Mr. Wilkinson's homestead were frequented by sections of the numerous and influential company, handling the animals, which, if possible, were one and all improved in condition and appearance since our previous notice. Old Zeal and her daughters, though in substance rivalled by Mr. Wilkinson's old stock from the "Lancaster" and "Roman" tribes, were, on the whole, probably the favourites, Earl Spencer's name operating like a talisman. But of the young bull Splendid, and other bulls, up to the oldest of the lot, we listened to endless encomiums, mingled with criticisms from our American and other friends, which only tended to show to how great an ordeal the animals arraigned before such a host of the most eminent judges had been subjected.

About two o'clock the company adjourned to the paddock lying betwixt Mr. Wilkinson's steading and the railway, where the dense and respectable crowd which environed the auctioneer formed a passing object of surprise to the Mansfield train.

Mr. STRAFFORD, on taking his place, briefly prefaced the proceedings by announcing the conditions of sale, and explaining that although after the purchase the animals would be at the buyers' own risk, still every care would be taken of them, and they might be removed any day within a week, say next Wednesday, or Mr. Wilkinson would give additional accommodation, if required. He felt that no small compliment had been paid him in asking him to offer for sale the magnificent stock that would be brought before them that day, and which only proved what care and length of time with judgment would effect in the improvement of stock. This herd had occupied Mr. Wilkinson's attention for upwards of 40 years. Many of the animals, as they were aware, had been bred from a cow of Mr. Charles Colling's, and the bull Favourite, to which he (Mr. Strafford) had alluded in the pedigrees as comprising the best blood was bought in the county of Durham, in 1811. Mr. Wilkinsoa, and his father before him, had paid great attention to the improvement of the breed, Mr. Wilkinsoa having made periodical visits to the seat of the short-horns, being a frequent visitor of Mr. Charles Colling and other celebrated breeders. He should direct their attention to particular animals as he passed along; but he might just state that for hair, symmetry, character of flesh, substance, and constitution, they were all that could be desired in short-horns. It was not often that breeders who, after spending so much time in making a reputation, could—as he had observed in the way of joke to his friend, Mr. Wilkinson, last night—have the courage to dispose of their stock; and he knew he would regret it on the morrow. In conclusion, he would say that he did not know a herd of the size that had been so long and carefully

bred. The animals, commencing with "Old Zeal," purchased at the Wiseton sale in 1846, she and her progeny since then being the mothers of 15 calves now living, and two lost, were then put up and disposed of in the following order:—

COWS AND HEIFERS.

LOT.	NAME, SIRE, AND COLOUR.	WHEN CALVED.	SOLD FOR GS.
1	Zeal, by Roman, white	May, 1837	.. 31
2	Roman Lively, by Will Honeycombe, roan	Apr. 22, 1845	.. 27
3	Princess, by ditto, roan	Feb. 23, 1846	.. 25
4	Young Daphne, by Queen's Roan, roan	Apr. 11, 1846	.. 34
5	Diana, by Will Honeycombe, roan	May 11, 1847	.. 31
6	Wiseton Lady, by Humber, roan	May 20, 1847	.. 30
7	Roman 9th, by Will Honeycombe, roan	July 31, 1847	.. 32
8	Roman 10th, by ditto, roan	Aug. 20, 1847	.. 50
9	Lancaster 11th, by Prince Royal, roan	Nov. 11, 1847	.. 28
10	Lancaster 12th, by Will Honeycombe r. w.	May 18, 1848	.. 50
11	Lancaster 13th, by Queen's Roan, red	March 9, 1848	.. 33
12	Pleazen, by Will Honeycombe, white	Apr. 26, 1848	.. 65
13	Lydia 2nd, by Queen's Roan, red	July 12, 1848	.. 32
14	Zeal 4th, by ditto, white	Mar. 31, 1849	.. 68
15	Lancaster 14th, by Will Honeycombe, ru.	Apr. 10, 1849	.. 52
16	Fair Helen 2nd, by Queen's Roan, roan	Apr. 30, 1849	.. 43
17	Red Lively, by ditto, red	July 29, 1849	.. 39
18	Roman 13th, by Will Honeycombe, roan	Sep. 21, 1849	.. 30
19	Z-alous, by St. Albans, roan	Mar. 18, 1850	.. 130
20	Lenton Lady, by Eclipse, red	Apr. 25, 1850	.. 51
21	Young Nell, by Queen's Roan, roan	June 20, 1850	.. 27
22	Butterfly 12th, by do., or Mag. Bon., roan	Nov. 12, 1850	.. 33
23	Hebe, 20th, by St. Albans, roan	Feb. 21, 1851	.. 36
24	Lancaster 15th, by Queen's Roan, red	Mar. 17, 1851	.. 39
25	Lavender 3rd, by St. Albans, r. & w.	Aug. 5, 1851	.. 110
26	Matchless 2nd, by The Marquis, r. & w.	Aug. 26, 1851	.. 50
27	Adelaide 2nd, ditto, roan	Sep. 18, 1851	.. 48
28	Lancaster 16th, ditto, r. & w.	Oct. 15, 1851	.. 49
29	Lancaster 17th, by Prince Royal, roan	Feb. 21, 1852	.. 31
30	Roman Lady, by St. Albans, roan	Apr. 18, 1852	.. 39
31	Lancaster 18th, by Prince Royal, red	Aug. 31, 1852	.. 32
32	Lancaster 19th, by St. Albans, red	Sep. 18, 1852	.. 32
33	Lancaster 20th, by ditto, r. & w.	Mar. 5, 1853	.. 26
34	Nell, by Monarch, roan	Mar. 22, 1853	.. 36
35	Lancaster 21st, by Lancaster Comet	Apr. 8, 1853	.. 34
36	Lydia 3rd, by St. Albans, red	Apr. 27, 1853	.. 28
37	Lancaster 22nd, by The Marquis, r. & w.	Aug. 1, 1853	.. 29
38	Roman 14th, by St. Albans, roan	Aug. 12, 1853	.. 26
39	Roman 15th, by Monarch, (not offered)	Aug. 14, 1853	.. —
40	Daphne 2nd, by Lancaster Comet, roan	Sep. 5, 1853	.. 21
41	Young Lively, by ditto, roan	Sep. 11, 1853	.. 16
42	Lancaster 23rd, by St. Albans, r. & w.	Sep. 12, 1853	.. 12
43	Chilton Lady, by Th. Marquis, r. & w.	Sep. 22, 1853	.. 34
44	Butterfly, by Monarch, roan	Sep. 28, 1853	.. 30
45	Hebe 21st, by Young Wellington, r. & w.	Oct. 3, 1853	.. 16
46	Pomp, by St. Albans, roan	Oct. 10, 1853	.. 55
47	Roman 16th, by Monarch, white	Nov. 14, 1853	.. 26
48	Roman 17th, by Prince Royal	Jan. 2, 1854	.. 23
49	Lancaster 24th, by ditto, r. & w.	Jan. 9, 1854	.. 10
50	Lydia, 4th by St. Albans, red	March 11, 1854	.. 10

BULLS.

1	Prince Royal, by The Duke, roan	May 23, 1848	.. 33
2	St. Albans, by Will Honeycombe, red	Apr. 8, 1848	.. 52
3	The Marquis, by Prince Royal, r. & w.	Jan. 28, 1848	.. 34
4	Lancaster Comet, by Queen's Roan, roan	Nov. 2, 1850	.. 42
5	Monarch, by ditto, white	Apr. 9, 1851	.. 75
6	Lentoian, by Prince Royal, roan	Dec. 13, 1851	.. 43
7	Lively Boy, by St. Albans, red	Apr. 24, 1852	.. 56
8	His Lordship, by The Marquis, r. & w.	Mar. 26, 1853	.. 21
9	Splendid, by St. Albans, roan	Apr. 11, 1853	.. 110
10	Premier, by Lancaster Comet, roan	May 13, 1853	.. 18
11	Lord George, by St. Albans, not offered	Aug. 23, 1853	.. —
12	Lincoln, by The Marquis, roan	Feb. 20, 1854	.. 29
13	Superior, by St. Albans, roan	Feb. 28, 1854	.. 61
11	Loyalty, by St. Alban's roan	March 9, 1854	.. 18
15	Derby, by The Marquis, roan	April 3, 1854	.. 0

The average price realized by the cows and heifers was £47 9s., and that realized by the bulls, exclusive of one or two calves, also £47. The aggregate of the sale, it will be seen, exceeded £2,900.

Amongst the purchasers were the Dukes of Rutland and Marlborough, Earl Ducie, Lord Walsingham, Sir John Crewe, Messrs. Ambler, Dawber, Eastwood, Smith, Dudding, and other celebrated breeders; and Mr. Anthony Cruickshank, of Sittyon, Aberdeenshire. The whole of Mr. Ambler's purchases, with the exception of Wiseton Lady, go to the western world, having been purchased for Dr. Watts and Mr. Waddle, the deputation from Ohio, who have visited almost

every part of England, Ireland, and Scotland, as well as France, making purchases of prime stock for transshipment to America.

The lots were severally disposed of as under :—

Cows.—Lot 1, Messrs. Pressberry; 2, Merton; 3, Hancock; 4, Robinson, for Earl Ducie; 5, Sir John Crewe; 6, Ambler; 7, Critickshank; 8, Morriss; 9, Kirkham; 10, Cooper; 11, Robinson, for Earl Ducie; 12, Eastwood; 13, Robison, for Earl Ducie; 14, 15, and 16, Reid; 17, George Smith; 18 and 19, Ambler; 20, Beauford; 21, Kirkham; 22, Reid; 23, Waite; 24, Machin; 25, Ambler; 26, Cooper; 27, Reid; 28, Beauford; 29 and 30, Ambler; 31, H. Wood, for Lord Walsingham; 32, Ambler; 33, Dawber, Keel Hall; 34, Ambler; 35, Scorer; 36 and 37, Dawber; 38 and 40, Scorer; 41, Sir John Crewe; 42, Hadley; 43, Morriss; 44, Ambler; 45, Darber; 46, Critickshank; 47, Waite; 48 Williams; 49, Bright; 50, Chambers.

BULLS.—Lot 1, Reid; 2, Williams; 3, Hawkridge; 4 Reid; 5, Hutton; 6, the Duke of Marlborough; 7, Dawber; 8, Wood; 9, the Duke of Rutland; 10, Grammar; 11, not offered; 12, Bradley; 13, Dadding, of Panton; 14, Wallace; 15, Joyce.

The business of the day concluded by an adjournment to the yard for the disposal of a few choice pigs of the white breed, which were rather larger, and scarcely so fine in the hair as the small white breed.

NEW PROCESS OF MAKING BREAD.

The new mode of making bread by the process of Messrs. Journet, Martin, and Mouin, has been surpassed by an experiment of Mr. Pepper's, which produced 536lb. 4oz. of excellent bread from the sack of flour, weighing 280lb.

MR. PEPPER'S REPORT.

“Laboratory, Royal Polytechnic Institution, April 15th, 1854.

“Having continued my experiments and microscopic examinations this week with the bread made by the new French process, as compared with the workhouse bread, both of which, it must be remembered, were made with the same flour, I am the more convinced that rice is the material which confers the water-keeping property upon the bread made by the new process.

“1,000 grains of each bread have been examined for gluten. The French contained 87½ grains; the workhouse 96½ grains. Now, the increased weight of gluten in the former, found by working the 1,000 respectively into 529 and 360, must have come from something added, as of course the flour has not the power of increasing the gluten during its conversion into bread; and the following analysis, deduced from the quantity of water and gluten obtained, will approach the truth as near as the analyst can go:—

529lbs. of French bread contain—	360lbs. of workhouse bread contain—
Gluten 34	Gluten 34
Gluten (possibly from semolina added) 12	Starch, sugar, gum 174
Starch from rice added..... 29	Water 152
Starch, sugar, gum 174	
Water 280	360
5.9	

“The above analyses receive a further verification from the result of the following recipe sent to me anonymously from Brighton, and printed on a sheet of note paper :—

“TO MAKE GOOD BREAD.—Tie up one pound and a-half

of the best American rice in a thick linen bag, allowing it ample room to swell; boil it for three or four hours until it becomes a smooth paste; mix this while warm with fourteen pounds of best flour, adding the usual quantity of yeast and salt. Allow the dough to work a certain time near the fire, after which divide it into loaves, and it will be found to produce from twenty-eight to thirty pounds of excellent white bread.”

“With the assistance of Mr. Clapperton, baker, Mortimer-street, this recipe was tried, and produced 20lbs. 13oz. of good bread, which, multiplied by 29, afford 536lbs. 4oz. from the sack of flour, 20 times 11 being 280lbs. Thus I produce 7lbs. 4oz. more than the quantity (529lbs.) produced by Mons. Journet, Martin, and Mouin; and I find that their bread eight days old has a sp. gr. of 1.190, the low sp. gr. obtained before being due to air retained in the cavities.

“In making the bread with the boiled rice, Mr. Clapperton says that flour must be dusted in, and most vigorously kneaded, and he will be happy to make any quantity for the curious, or those doubtful of the fact. In conclusion, I need hardly state that the addition of rice does not make the bread unwholesome. The rice certainly confers a valuable property upon the bread, viz, the power of keeping moist and sweet for a longer period than the ordinary bread; and in large families or communities, baking at home, it might be found an economical mode of satisfying hunger, although the nutritious qualities, weight for weight, as compared with ordinary bread, would be about 50 per cent. less, *i. e.*, speaking in round numbers, a person must eat about 1½lbs. of the bread made with rice to obtain nutriment equivalent to one pound of ordinary bread. (Signed) “JOHN HENRY PEPPER,

“Professor of Chemistry, Royal Polytechnic Institution, F.C.S., A.C.E., &c., &c.”

HALESWORTH FARMERS' CLUB, AND THE LAW OF SETTLEMENT.—The removal of the poor, and the bill lately introduced into Parliament by the President of the Poor Law Board, were taken into consideration by the members of the Halesworth Farmers' Club, at a meeting held on Friday, the 7th inst., when the following petition was agreed upon, and is now in course of signature by the rate-payers:—

To the Honourable the Commons of the United Kingdom of Great Britain and Ireland, in Parliament assembled.

The humble petition of the members of the Halesworth Farmers' Club, Landowners, Farmers, Tradesmen, and others, resident within the Blything Union, in the County of Suffolk,

SHewETH,—

That many of your petitioners have had great practical experience in administering the Law for the Relief and Management of the Poor in this district, and beg to represent to your Honourable House, as the result of experience, that they are strongly of opinion that the law relating to the settlement and removal of the poor is unsound in principle.

That such law has an injurious effect, not only upon the comfort and well-being of the poor, but also upon the interests of the employer of labour.

That the existing plan of raising the necessary funds for the relief of the destitute poor is open to great objection, and requires to be revised and placed upon a more equitable and extended basis.

That your petitioners are further of opinion, in order to mitigate the evils existing in the present system of adminis-

tering the Poor Laws, that it is absolutely necessary that the power of compulsory removal of the poor from one parish to another be prohibited, and the area of rating be considerably extended.

Your petitioners humbly beg to suggest that the necessary funds for the relief of the destitute poor be raised by an equal assessment on all descriptions of property, by which means the tax would be raised upon a sound and equitable principle, upon all parties in the State.

That your petitioners have learned with satisfaction that the President of the Poor Law Board has lately introduced into your Honourable House "A Bill to abolish in England and Wales the compulsory removal of the poor on the ground of settlement, and to make provisions for the more equitable distribution of the charge of relief in Unions;" and fully believing such measure is calculated to remedy many of the evils complained of, as resulting from the present Poor Laws, humbly pray that your Honourable House may be pleased to pass such bill into a law as speedily as possible; by which means it is hoped that the poor man will have full scope to carry his labour, which is his only capital, to the best market, and thus be made a free citizen of the State, to reside where he pleases, without impediment or restraint.

And your petitioners will ever pray, &c.

AGRICULTURAL QUERIES.

SIR,—I should feel greatly obliged, if any of your correspondents would say, in your next paper, what should be the amount of the tithe rent-charge on a sheep farm, let at £110 per annum—what proportion the tithe rent-charge should be to the annual value or rent.

I remain, yours truly,

April 9th, 1854.

A SUBSCRIBER.

A correspondent says: Will any one tell a young farmer the best and cheapest weighing machine for sacks, and such like purposes, and where to be had?

A Suffolk Miller writes: Will some of your numerous correspondents have the kindness to inform me, through the medium of your valuable paper, whether an inspector of weights and measures can (in their opinion) possibly test and correct our bushels, in conformity with the brass bushel, by trying them with grain?

ANSWERS TO AGRICULTURAL QUERIES.

SIR,—For the information of "A Young Farmer," I would say for the last 15 years I have had to do with weighing machines of different make and description, and find those manufactured by Messrs. W. and T. Avery, Birmingham, to surpass any other I have yet seen. I have one that has been in constant use for 6 years, and a halfpenny will turn it either way. The cost price to me this distance from Birmingham was £2 17s.; but I believe I could have one now at £2 10s. Mine has not cost me a penny since the first cost.

I am, sir, yours truly, R. WHITEHEAD.

Mount Pleasant Mill, Framlingham, April 8th.

SIR,—Your correspondent asks, "What should be the amount of rent-charge on a sheep farm, let at £110; or what proportion the tithe rent-charge should be to the annual rent."

I presume his parish has been commuted; if so, he has only to look at the apportionment, and he will have no difficulty in obtaining his answer: if not, and he wishes to ascertain what it ought to be when commuted, I should say, looking at its real value, it would be something like 1s. 3d. of the rent, or more, according to circumstances. I presume your correspondent would consider his farm liberally let, if he makes five rents: that is to say, if the produce of his farm averages £550, his rent being £110. Now, the rent-charge represents one-tenth of the produce formerly taken in kind, now commuted for a money payment. The rent-charge, therefore, on a produce of £550 would be £55. Your correspondent will see that the lower the rent the greater will be the proportion of the rent charge to it; as, if his rent were £100, the rent-charge would be rather more than half the rent.

April 17.

SUBSCRIBER.

DOMESTIC GUANO.—The droppings from the hen-roost, if carefully preserved and properly applied, we find a most valuable addition to our stock of manures. For saving of it we have a roosting place partitioned off in the upper part of a shed, for which a tight floor is laid, open at the back side, under which a large and rather shallow box is built, into which receptacle ashes, lime, plaster, and any thing of the kind, is from time to time mixed with the cleanings from the floor above. This, at the time of corn planting, is drawn out, and a small handful dropped in each hill, being careful at the planting to draw a little dirt over it as the corn is dropped, as if it come in immediate contact with the corn it will in most cases destroy the young sprout. This is considered a better way than to mix with loam before dropping in the hill, as it is less bulky, and the planter who drops his own seed can draw on a little earth before dropping his corn, with no trouble at all. I have had better corn manured in this way, with no other manure, than from land adjoining with quite a heavy coating in the usual way.

LAMBS WITH SORE MOUTHS.—EWES WITH SORE UDDERS.—SIR: Having seen in a report of the proceedings of the Royal Agricultural Society of England, a communication from Mr. Creswell, Leicestershire, relative to sore mouths in lambs, I beg to state, for the information of your numerous readers, that we had a flock of lambs affected with the same disease on this farm in the spring of 1853, and also the udders of many of the ewes; and after trying several applications, we succeeded in curing them all without any loss, by rubbing the sores, once a day, with a mixture of equal parts of gunpowder and common salt. This will be found a speedy and effectual remedy. Yours, &c., RICHARD FAUCETT,—Ballygannon, Ashford, April 6, 1854.

HOW TO CLARIFY WATER.—A correspondent of the *Sydney Morning Herald* says:—At this place both the water and the pasturage were bad; the former in fact could hardly be used, and this we found was a difficulty which attended us throughout the journey. Fortunately, however, we had provided ourselves with a very simple remedy, in the shape of a supply of alum. Even the muddiest water can be made clear as crystal by mixing with it a small portion of this mineral pounded very fine, say a pennyweight to a bucket. In less than a minute after the alum is applied, all the clay and other impurities held in solution coagulate and fall to the bottom, leaving the water above perfectly clear. We found this in all cases a very effective remedy, except where the water had the taste of the gum leaf, or some other vegetable substance—a circumstance which but too frequently occurred. Still it was very consolatory to know that we could procure clear water on all occasions, and I am disposed to think that if this remedy were more generally adopted and practised at the diggings, dysentery and other diseases of that kind would not be more prevalent among the diggers than among any other class of the community.—*Australian and New Zealand Gazette*.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR
APRIL.

Notwithstanding that the weather of the past month has shown great changes in its temperature, very little rain has fallen in any part of England. The absence of moisture, combined with some rather sharp frosts, which have produced rather strong ice in the northern parts of the island, has tended to check the progress of vegetation; and we learn that in many counties early beans and peas have suffered severely. As regards the appearance of the young wheats, our accounts are rather conflicting. We may observe, however, that they are tolerably forward, taken as a whole, and are looking somewhat promising, except upon poor soils. Of course it is yet too early to speak with confidence as respects the probable crop; but we may venture to observe that there is every prospect of a fair average yield. The quantity of land under wheat culture this season is by far the largest ever recollected. Almost every district in England has an excess over last season by at least one-third; hence, should the crop prove abundant, we may look forward to an immense aggregate return. From all quarters, our advices agree in stating that the quantity of last year's wheat in the hands of the growers is very small; and we learn that the result of thrashing continues very unsatisfactory. There is, however, an abundance of straw; but we may safely conclude that, notwithstanding the high range in prices for some months past, the actual return in money upon the growth of 1853 has been by no means compensating, when the great deficiency in the produce is taken into account. The value of wheat has been firm, both in the metropolis and elsewhere; and notwithstanding the war with Russia, the imports from abroad have been on an extensive scale. Opinions differ widely as regards the extent of future imports from abroad, and many parties are anticipating a serious falling off in them; but as the wants of France appear to be well supplied, and as the stocks in the United States are acknowledged to be extensive, we trust that our deficiencies, though large, will be well met, without prices here being advanced to a famine point. There appears to be a good supply of barley yet on hand, and the supplies of oats, beans, and peas are by no means limited, the time of year considered; nevertheless it is tolerably clear that oats, arising from the blockade of the Russian ports, will be a dear article of consumption for several months.

The large quantities of potatoes which continue to appear on sale have taken some persons with surprise, considering the extent of the failure of the crop in many localities last season. It will be recollected that we intimated that the breadth of land under potato-culture was unusually large, and that the total growth of that esculent, especially in Scotland, was far from deficient. That our remarks were correct, is evident from the present state of the markets, and the numerous heavy arrivals. From the continent the imports have not been large; and we understand that much of the winter supply in Holland and Germany has now been consumed. No doubt the large supplies of potatoes have had considerable influence in keeping down the price of wheat and barley.

The lambing season has passed off extremely well. In the great flock districts the fall has been a good one, and the fineness of the weather has been favourable to the young lambs. It has been a general subject of remark that a greater number of really good lambs has appeared in Smithfield this season than for many years past; hence, prices have been high, and consequently very remunerative. The winter stock of food is nearly exhausted, and rain is much wanted to produce an early crop of food.

Great excitement has prevailed in the market for linseed, and prices have risen extensively. The Greek merchants, who have entered into contracts for forward delivery, are likely to be considerable losers by the decline in the imports of Russian linseed, although great efforts are being made to bring produce overland to Memel, from whence it will be sent to England. This, however, must prove a tedious and most expensive mode of proceeding; and we entertain great doubts whether we shall thus receive anything like our usual importations. From India we may safely calculate upon a large increase in the supply; but it can scarcely keep pace with the decline in the imports from Russia. From the Black Sea alone, upwards of 500,000 quarters were received in 1853, with a corresponding quantity, exceeding 270,000 quarters, from the Baltic. No doubt rape-cakes will be largely substituted for linseed qualities; yet it is evident that breeders and feeders of fat stock will be compelled to pay a high value for that description of food. In the early part of the month, the tallow market was in a very excited state: prices rapidly advanced. But when it became known that our Government had determined

not to issue letters of marque, and that Russian produce shipped in neutral ships, and from neutral ports, would not be seized by our cruisers, and that it was possible supplies might be derived from Russia through German houses, the demand became heavy at drooping prices. There have been large quantities of rough fat in the market, which have sold at from 3s. 7½d. down to 3s. 5½d. per slbs.

The article of guano has continued very scarce and dear. The whole of the importations having been sold prior to arrival, the quantity now remaining in second hands is unusually small. The best Peruvian has readily sold at £11 10s. per ton. The arrival of vessels from Peru this year has been a very late one, owing to the high freights and the scarcity of shipping.

The greater portion of the hay on sale in the metropolitan markets having proved of inferior quality, prices have kept up remarkably well. Straw, however, has sold on rather lower terms than in the previous month.

The wool trade has been in a most unsatisfactory state. The "strikes" in the manufacturing districts have no doubt tended to render manufacturers cautious in their operations; but in the event of the present differences being adjusted, we may look forward to a brisk demand, more particularly as the stock of woollen goods has become extremely small. The present clip of English wool is turning out large, and we learn that the shipments from Australia are likely to be considerably in excess of most former years, owing to the improved facilities now afforded the growers to send their produce to this country.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The most striking feature we have to notice in connection with the trade in cattle, is the great comparative deficiency in the imports of foreign stock, not only into London, but likewise at the outports. The decline in the shipments from Holland and other quarters, at a time that prices here are ruling very high, is deserving of particular attention, as, in the event of its continuing, it cannot fail to have considerable influence upon the value of home-fed beasts and sheep. From inquiries instituted in Holland, we learn that our views taken some months since, in reference to the changes in the tariff laws of France, have been realized. Numerous large purchases of stock have been effected in Holland and Belgium on French account, and which have, as a matter of course, reduced the available quantity of stock at one time intended for the English markets; and, if our information is correct,

it would appear that the Dutch graziers have rather over-shipped themselves, and that, as a consequence (more particularly as they have now become a rich body of men), they are in no way anxious to dispose of their stock at present. It is possible, however, that future imports into this country will be of a greatly improved character; in other words, that they will be more suited to our markets, and command relatively higher prices than at present. Although the foreign supplies have shown a decline, English stock has come forward freely, and in excellent condition; consequently there has been no want of supply in Smithfield. The stock from Scotland has arrived in admirable order; but the prices realized for it have not been considered very remunerative. With the exception of beef, prices have undergone no material change. Lamb has sold at high prices. It is gratifying to observe that no serious cases of foot-rot in sheep have been noticed. The decline in the value of both skins and wool has reduced the difference between shorn sheep and those in the wool to 8d. per slbs. Last year at this time it was 1s. per slbs.

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

	Head.
Beasts	1,902
Sheep	2,131
Calves	709
Pigs	18

Total..... 4,760

No lambs have come to hand at the outports. The arrivals have been on a very moderate scale. In the same period, in 1853, the total supply of foreign stock amounted to 14,787; in 1852, 5,444; in 1851, 10,289; in 1850, 4,637; in 1849, 3,810; in 1848, 5,391; and in 1847, 5,826 head.

The annexed total supplies of English, Scotch, and foreign stock have been exhibited and disposed of in Smithfield:—

	Head.
Beasts	20,813
Cows	402
Sheep and lambs	107,840
Calves	1,212
Pigs	2,300

Of the above supplies, 10,500 beasts came to hand from Norfolk, Suffolk, Essex, and Cambridgeshire, 3,900 from other parts of England, and 2,580 from Scotland.

COMPARISON OF SUPPLIES.

	April, 1851.	April, 1852.	April, 1853.
Beasts	16,674	18,069	19,863
Cows	304	418	477
Sheep & lambs	108,824	101,374	115,830
Calves	1,152	1,500	1,891
Pigs	2,510	2,580	2,245

The highest and lowest figures have ruled thus:—

PER SILBS. TO SINK THE OPFAL.

	s. d.		s. d.	
Beef	from	2 10	to	4 6
Mutton		3 2		5 0
Lamb		5 4		7 4
Veal		3 10		5 8
Pork		3 6		4 8

COMPARISON OF PRICES.

	April, 1851.		April, 1852.		April, 1853.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef..	2 2	to 3 8	2 2	to 3 6	3 0	to 4 4
Mutton	3 2	4 6	2 6	4 2	4 0	5 4
Lamb	4 10	6 0	4 4	5 6	5 0	6 4
Veal..	3 0	4 0	3 0	4 2	3 4	4 6
Pork	3 0	3 10	2 6	3 10	3 0	4 4

Newgate and Leadenhall markets have been seasonably well supplied with each kind of meat, for which there has been a steady demand. Beef has sold at from 3s. to 4s.; mutton, 3s. to 4s. 4d.; lamb, 5s. 2d. to 6s. 10d.; veal, 3s. 8d. to 5s. 4d.; pork, 3s. 4d. to 4s. 8d. per silbs. by the carcass.

CALENDAR OF AGRICULTURE.

The work of the farm now presses hard on the cultivator of the soil, and requires every diligence and exertion he can command. The planting of beet-root and potatoes must be finished in the early part of the month, with the sowing of grass seeds, and the hoeing and cleaning of drilled crops must have a constant attention. Sow Swedish turnips in the purple and green-topped varieties, and Aberdeen yellow bullocks as a later sowing. Plant cabbages, kohlrabi, savoys, and winter broccoli. Sow rape to be eaten on the ground preparatory for wheat, and sow early white turnips for use in autumn.

Pare and burn lands constantly during this month, and prepare turnips and clay fallows.

All dung-heaps must be turned over for ten days before being used, in order that a fermentation may take place; all lumps and large pieces must be carefully broken and shaken out. Watered meadows may now be shut up for hay; gates and fences must be thoroughly repaired for summer use.

Cattle of all ages will now go to grass; the milch cows in a well-watered and sheltered field, and the store cattle will go to the pasture fields, and be arranged according to age. A proper arrangement conduces much to their well-being and thriving. The calves of the year must be similarly arranged; the oldest in a grass paddock provided with water and ashed for shelter, and have one suckling daily, and have clovers and vetches in racks. Spare neither pains nor expense on young animals. The young calves in the house pens should have green

meat given them, in order to accustom them to such food previous to being turned out.

The ewes with young lambs must have oats and oil-cake in troughs to eat, till the rye and early vetches are ready. The food may be cut and given in racks, as directed last month; and part must be carried to the home yards for soiling horses, cattle, and swine. Litter amply. As the land is cleared, plough it for a turnip fallow.

Hop grounds may be dug this month, and the bines tied to the poles; young hedges weeded, oak trees cut, and the bark stripped and dried.

Wash sheep by hand in a running stream a week or two before shearing, to prevent the maggot-fly depositing on the animals; sprinkle them from head to tail from a dredging-box with a mixture of hellebore-root powder and black brimstone, $\frac{1}{4}$ lb. to $\frac{1}{2}$ lb. No month in the year employs the farmer more busily than the present; and if he loses ground now, he will rarely recover it during the whole summer. The preparation of the turnip and clay fallows is in the critical season; the first crops must be planted, and the rest prepared for with the utmost attention and exertion.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BAKEWELL FAIR.—There was an abundant show of stock of all kinds, except horses. Milch cows, and incalvers near at hand, were eagerly bought up at high prices, while barrens, storks, and rearers found ready purchasers at good figures. In sheep, hogs ranged from 27s. to 33s., and ewes, with single lambs, brought from 48s. to 51s. The show of horses was inferior, and not much business done. Pigs were in abundance, but dull of sale, in consequence, apparently, of the high price of keep.

CHESTER FAIR.—There were at market 529 horned cattle, 725 sheep, and 596 pigs. Prices were, for fat beef from 6d. to 6 $\frac{1}{4}$ d. There was a large show of good milking beasts, which fetched from £10 to £18. Very few fat sheep were offered, and they sold at fully 8d. per lb. A good many store sheep were in the market, and fetched good prices, but not so high as they have been on account of the absence of rain. There was a dull sale of store pigs, and the little fat pork offered sold for 5 $\frac{1}{2}$ d. The horse fair included a moderate show, and good animals sold at high prices.

DARLINGTON FAIR was well attended. The supply of cattle was pretty large, and there was a good show of lean stock for grazing purposes. Sheep were plentiful, there was a good attendance of buyers, and the market was cleared out, at good prices. Beef, 6s. 6d. to 7s. 3d. per stone; mutton, 6d. to 6 $\frac{1}{2}$ d. per lb. The show of entire horses was numerous and of good quality, many of them displaying symmetry and action of a very high order.

DAVENTRY FAIR, both with regard to the supply of fat and store beasts, was more limited than is usual; and but few store beasts, on account of the high prices demanded, and the great shortness of keep, changed owners. The beef made about 6d. per lb. The mutton trade, for the same reason, was

also dull, and the supply but short. Fat mutton was rather a better trade, and made 6½d. per lb. without the fleece.

DEVIZES FAIR.—We had more than the usual number of sheep penned. Owing to the extreme dry weather the sale was slow, at 2s. per head less than last year; couples, from 30s. to 40s.; tegs, 28s. to 33s. The supply of cattle was good, but quality generally inferior; the best things realized late prices, but the weather affected the sale of other descriptions, which were decidedly lower. Cows and calves of good quality from 18 to 20 guineas. The show of horses on the Green was very poor, but the various stables in the town presented some good animals. Mr. Hillier Reeves had a string, which brought from 30 to 40 guineas each. Some good London horses were also sold at high prices.

DRIFFIELD FAIR.—There was a large show of hog sheep, but a heavy market, and those sold did not realize the prices expected. There was only a short supply of lean cattle.

GLASGOW HORSE MARKET.—The show was not so great as we have seen on similar occasions, but the quality of the animals generally was fair. The better cart-horses went off early, and realized good prices, but upon the whole we cannot say it was an exceedingly busy market. Superior draught horses fetched £35 to £40; second quality, £25 to £30; and inferior, £18 to £24. There were very few good ponies shown, and saddle horses were of dull sale. A number of capital Irish horses, however, fitted for military purposes, made their appearance, and were quickly picked up at excellent prices.

HAVERFORDWEST FAIR was very well supplied with stock. There was a very large number of dealers present, and prices ruled unusually high. Long before mid-day all fat stock, both beef and mutton, had been purchased at more than remunerative prices. Beef at 7d. and 7½d. per lb., and mutton at 8d. to 8½d. The horse fair was but thinly attended; but for any passable animal good prices were obtained.

ILSLEY FAIR.—The supply of sheep was not so large as many anticipated, and the buyers being numerous, no reduction worth noting took place. We believe that in tegs of the middling description more money was made, and the greater part of the sheep were sold at most satisfactory prices.

LEEDS FORTNIGHT FAIR.—The show of cattle comprised 670 head, of excellent quality. There was a good attendance of buyers, and at the close a good clearance was made. Prime beasts, 8s. 4d.; second quality, 8s.; inferior, 7s. 8d. per 16 lbs. Sheep, 5500; a good market, nearly all being sold. Sheep in wool, 7½d.; clipped, 6½d. per lb.

LINCOLN FAT STOCK MARKET.—There was an abundant supply of beasts and sheep, the holders of which experienced a pretty brisk sale; many buyers, some of whom were from a considerable distance, being in attendance. Beef realized from 7s. to 8s. per stone, and sheep in the wool 7d., and clipped sheep 6d. per lb. Nearly every thing in the market was sold.

LOCKERBY HOG FAIR.—There were 5,000 hogs shown for sale, principally half-breeds. The market had much the same character as that of Dumfries the previous day, but sales were rather quicker, and prices a shade firmer. The highest price given for half-breeds was 40s., and from this figure they ranged to 27s., the general rates being from 33s. to 35s. Cheviots were sold at rates ranging from 20s. to 27s. The premium half-bred hogs weighed on an average 165½ lbs. each, the top weight being 187 lbs.; 55s. each were offered for the lot before they were exhibited. The second best of this description was sold at 46s. The average weight of the premium Cheviots was 121 7-10th lbs; we did not learn what prices they brought, but one of the competing lots was sold for 30s. There were a few cattle shown for sale.

OTLEY FAIR.—So far as regarded numbers, there was a large show of animals, but the majority were of inferior quality. Many purchasers were in attendance, and good beasts sold pretty readily at high prices.

PENRITH FORTNIGHTLY FAIR.—The supply of fat was limited, and the vendors asked very heavy prices—prices, in fact, which savoured of war and famine. A few cattle passed into the hands of the butchers, but the major part of the sheep went back unsold.

POULTON-LE-FYLDE FAIR.—A pretty good show was exhibited. There was a considerable number of dealers in attendance, and prices ranged high. Calving heifers sold from £9 to £16 each; drapes in proportion. The show of brood horses was very good, and the prize offered by the Fylde Agricultural Society for the best horse for agricultural purposes was awarded to "Hercules," the property of Mr. Crook, of Inskip.

RIPLEY FAIR.—There was a good supply of cattle of every description, and the best qualities went off pretty readily at good prices, but the inferior kind remained unsold. There was a very good show of horses, both as regards numbers and quality.

SELBY FAIR.—The show of beasts was very good, though they were not so numerous as on some former occasions. Large prices were asked, and rather freely submitted to. The horses were of a rather inferior description, but good prices were realized.

SHIPSTON-ON-STOUR FAIR was well attended both by dealers and cattle. Beef fetched 6d. to 6½d.; mutton, 7d. to 7½d. There was a good supply of horses, some of which realized from 80 to 90 guineas. There was a great demand for stock of all kinds, and they were cleared off early.

SHREWSBURY FAIR.—Best heifer beef made fully 6½d., second quality 6d.; veal, 6d.; wether sheep, in the wool 8d., out of the wool 6½d. to 7d.; fat lambs 20s. to 25s. each; and useful couples from 40s. to 50s. Good ewes and calves, and also useful stores and oxen, sold well. Pigs unaltered.

TWYKESBURY FAIR was very small, there being but a poor attendance of man and beast. Beef realized from 5½d. to 6½d., and mutton from 5½d. to 7d. per lb. There were no horses offered for sale.

TIVERTON GREAT MARKET was abundantly supplied with stock, which sold at somewhat advanced rates. Among the animals exhibited were four fine oxen, the property of Mr. W. Norrish, Loxbeer Barton). A two-year-old bull, shown by Mr. John Luxton, Pileywell farm, was pronounced by competent judges to be, in point of size and quality, one of the finest specimens of its class they had ever seen. There was also a large number of Guernsey and Alderney cows, some with calves, and others in calf, which changed hands at prices varying from £7 to £12 each. There was a small supply of fat bullocks, which sold readily at 10s. 6d. per score. Cows and calves were rather scarce, and were quoted at from £11 to £16 each. Good barreners were not very plentiful, and realized 7s. to 7s. 6d. per score. There was a fair show of three-year-old steers, which found purchasers at £18 each. Butchers' calves were plentiful at from 5d. to 5½d. per lb. The supply of sheep was exceedingly large, but sales were dull. Fat wethers, 7d. per lb.; store hogs, £2 to £2 10s. each; ewes and lambs, £2 to £3 per couple. A drove of shorn sheep exhibited in the market attracted a good deal of attention.

WAREHAM FAIR.—Cows and calves sold at high prices, and good barreners were in great request. There were a few lots of sheep penned, but they were soon all disposed of.

WINCHESTER FAIR was very fully supplied with most descriptions of cattle. Of sheep there was an over-abundant

stock; and, partly owing to the shortness of feed, prices were rather lower than of late. Horned cattle were dear, and good sorts were eagerly bought. Horses, however, were not so plentiful; good sorts fetched large sums. The fair assumed more of a business character than we have known for some time past.

YORK FORTNIGHT MARKET.—We had a fair supply of fat beasts, of about medium quality, which had tolerable demand at from 6s. 6d. to 7s. 3d. per stone. The show of lean short-horned steers and heifers, and also of drupe cows,

was good; but in consequence of the continued dry weather stopping the demand for grazing cattle, they were sold at from 20s. to 30s. per head below last month's prices, and many unsold. A moderate number of Irish beasts had the same downward tendency. Calving and dairy cows had also slow sale at drooping prices. Mutton sheep were in abundant supply, and sold, clipped, 5d. to 6½d.; ditto, in wool, 6d. to 7d. per lb. Grazing hogs were plentiful, but they had slow demand, and only realised about last Michaelmas prices.

REVIEW OF THE CORN TRADE DURING THE MONTH OF APRIL.

The weather has been of a somewhat unusual character for the month of April; during the first three weeks the wind was almost constantly from the east, with a bright sky, hot sunny days, but cold nights. The barometer stood very high up to the 18th inst., when it began to sink, and continued to fall for two or three days; and on the 21st and 22nd we had rain with north wind. Subsequently, the cold increased; and we have since had severe night frosts, with a slight fall of snow on the morning of the 24th inst. The absorbing east winds which have prevailed, and the want of rain, have caused some uneasiness to be felt in regard to the Lent-sown crops; but this has not been so great as to have much influence on prices.

The late-sown barley has hardly as yet appeared above ground, and oats on sandy soils have certainly suffered from drought. The growth of grass has been exceedingly slow, and the prospects for the hay crop are thus far by no means promising.

In regard to wheat, the reports are, with few exceptions, of a satisfactory nature: the plant is in some localities thin on the ground; and in other, mischief has been done by the grub, but these are the exceptions to the rule; and as a larger breadth of land than usual is under wheat, the slight drawbacks alluded to are not considered of much importance. Indeed, wheat is rarely injured by dry weather; and though many dangers have yet to be encountered between this and harvest, the favourable manner in which sowing was completed, and the auspicious character of the spring, have naturally given rise to hopes more or less sanguine in regard to the probable result. The confidence felt on this point has unquestionably had a good deal of influence on the trade, and has prevented any material effect being produced by the shortness of the home supplies. The subject is, nevertheless, worthy of notice, as it proves that the deficiency in the harvest of 1853 was rather under than over rated. In many of the most important markets in

the agricultural districts, the deliveries from the growers have, for weeks and weeks past, been quite inadequate to provide for the local wants, and the millers have been compelled to visit the ports on the coast to obtain foreign wheat. We know that many are still of opinion that farmers are holding back their wheat, under the impression that prices will hereafter be higher; but in this we are not disposed to agree. The decrease in the supplies has been too regular and too general in all parts of the kingdom to be thus accounted for.

By a parliamentary return lately published of the sales made at the towns which return the averages, during the first three months of 1853 and 1854, we find the matter to stand thus—

	Jan. qrs.	Feb. qrs.	March. qrs.	Total. qrs.
1853 ..	532,282	345,329	358,886	1,236,497
1854 ..	266,477	256,061	227,556	750,094

Since then the falling off has been still more striking, the sales being, for the week ending—

	1854.	1853.
April 8	36,628 qrs.	88,343 qrs.
„ 15	41,926 „	75,972 „
„ 22	54,353 „	68,439 „

So long as nothing occurs to give rise to feelings of uneasiness in reference to the growing crop, and whilst we continue to be so liberally supplied with foreign wheat, as we have been thus far, the smallness of the home deliveries creates no very great impression; but that stocks of English wheat will have been used up very closely before the new crop can be made available is our firm impression.

As yet, the war with Russia has no way lessened our supplies of foreign corn; indeed, the effect cannot be felt till later in the year; but that it will then be felt cannot be questioned. The following official account of the quantities of wheat imported into the United Kingdom during last year, with the countries from whence the same were received, will

show how great a blank will be occasioned by the supplies from Russia being cut off.

	1847.	1848.	1849.	1850.	1851.	1852.	1853.
	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.
Russian, Northern Ports	1,620,026	371,820	340,033	203,779	572,257	343,949	634,404
" Black Sea ports	531,742	342,823	572,355	589,250	762,160	957,877	1,070,433
Denmark and Duchies	691,685	1,042,313	1,311,086	1,077,735	849,007	770,194	947,016
Prussia	650,936	871,777	1,354,091	1,343,780	930,168	554,703	1,177,704
Hanse Towns	214,873	663,353	596,073	392,853	143,476	167,858	305,011
Other ports, Germany	221,535	407,932	416,023	457,844	336,631	339,784	368,075
Holland	189,645	436,129	586,739	495,614	153,774	321,563	170,702
France	295,184	494,288	1,019,410	1,323,922	1,591,377	748,162	714,242
Italian States	518,962	189,102	406,034	210,249	555,905	138,974	237,755
Wallachia and Moldavia	463,212	227,335	325,128	271,505	624,242	713,876	665,106
Turkish Donms. not otherwise specified	463,213	188,583	423,970	276,528	474,337	200,021	744,084
Egypt	542,034	368,482	392,727	558,063	958,935	777,745	643,139
British North America	485,642	203,914	181,022	93,860	143,378	126,240	189,357
United States	4,238,239	1,290,303	1,816,425	1,082,755	1,211,365	1,400,430	1,821,484
Other Countries	754,883	474,309	925,759	528,853	316,294	233,333	489,363
Total	11,012,304	7,528,472	10,669,661	9,019,590	9,618,026	7,746,669	10,173,135

The future range of prices will depend so greatly on the weather we may experience from now up to harvest, that opinion on the subject can be of little value. It appears, however, to us that present prices for wheat are likely to be about supported even if the summer should prove propitious. We

come to this conclusion mainly on the grounds already alluded to, viz., the belief that farmers have really less wheat on hand than usual at the corresponding period of the year; and further, to the conviction that the absence of the accustomed supplies from the Russian Baltic ports, and from the Black Sea and Azoff, will before autumn be seriously felt. The fluctuations in prices have been rather important during the month. The tendency was decidedly upwards; and before the close of March, and during the first week in April, an advance of 1s. per bushel, or 8s. per qr., was established generally, in most of the leading provincial markets. This was caused partly by the supplies proving inadequate to provide for the consumptive demand, and partly by the official proclamation of war against Russian. The excitement was, however, short-lived; and since then the trade has been quiet. The week immediately following that in which war was declared, a reaction to the extent of 2s. to 3s. per qr. took place, but this has since been partly recovered; and, though there is an absence of excitement, the tendency of prices is on the whole upwards. Though opinion is rather in favour of higher prices, present rates are deemed too high for speculative investments, and those who buy for consumption are in general deterred from holding large stocks. The plan pursued has for some time been, to purchase only sufficient to provide for a limited period; and we have, consequently, intervals of comparative inactivity, followed by temporary excitement. In the early part of the month rather large quantities of foreign wheat were taken by country buyers, hence the simultaneous rise at the principal ports; immediately afterwards there was a lull in the demand, and a partial reaction in prices. The impression at present is, that what was then bought has been nearly consumed, and that a speedy renewal of the demand may be calculated on. Meanwhile we continue to be plentifully supplied with foreign wheat. Independent of good supplies from the Baltic, a large fleet of grain-laden vessels from ports east of Gibraltar has made its appearance off the coast. During the week ending 22nd inst. 118 corn-laden ships arrived at Queenstown for orders, of which about 90 carried wheat; there is, consequently, no reason to apprehend any immediate scarcity. The fact of these large arrivals, and the facility with which our wants have hitherto been supplied, may perhaps give rise to a feeling of security which might be attended with more or less danger, for the period at which the pinch is likely to be felt will, in our opinion, be some months hence. Thus far, the war with Russia has tended to increase rather than diminish our supplies, inasmuch as the greatest exertions have been made, when it had

become known that the export of grain would after a certain period be prohibited from that country, to despatch all that could possibly be collected previous to the prohibition coming into force. Shipments have now for some time ceased, and cannot again be resumed until the war shall have terminated. In this position of affairs it is impossible to over-rate the importance of a favourable or unfavourable harvest, and the prospects for the growing crop must be watched with the utmost anxiety. We shall here close our speculations in regard to the future, and commence our retrospect of the trade at Mark Lane during the month now about to terminate.

The arrivals of home-grown wheat into the port of London have been so extremely insignificant that they have furnished a very unimportant item towards providing for the consumption of the metropolis. The receipts coastwise during the month have amounted to only 5,000 to 6,000 qrs., a case, we believe, almost unprecedented.

On Monday, the 3rd inst., there was a considerable competition among the millers, to secure the few samples of wheat exhibited on the Essex and Kentish stands; factors were consequently enabled to obtain prices fully 8s. per qr. above those at which similar qualities had been sold on that day week. The succeeding week buyers appeared to have come to the conclusion that they had acted somewhat rashly; and though there was little or no increase in the quantity exhibited on the following Monday, there was a decided unwillingness to continue operations on the terms previously paid, and sellers had to give way 2s. to 3s. per qr. before a clearance could be effected. From this time up to the 24th inst. prices remained nearly stationary, factors refusing, on the one hand, to make any further concession; and buyers, on the other, paying former rates with evident reluctance. On the occasion named, there was a slight increase in the quantity of wheat brought forward from the neighbouring counties, which strengthened the determination of the millers not to buy, except at some decline, and sellers positively refusing to give way, several runs were left on hand at the close of the market, which have, however, since been placed.

The arrivals of foreign wheat, though not so abundant as in March, have nevertheless been amply sufficient to satisfy the demand. From the commencement of the month up to the time we are writing, about 70,000 qrs. have come to hand, and further supplies from the Baltic are known to be close at hand. We may also expect that a portion of the Black Sea arrival off the coast will be ordered round to this port, and our millers are likely therefore to have a good choice of quantity to select from. It must, however, be remarked that, owing

to the extreme scarcity of wheat at the markets in the interior, London has this year to furnish supplies to a much greater extent of country than usual, and stocks do not therefore accumulate to anything like the extent that might be supposed, looking at the magnitude of the arrivals.

The attendance of buyers from different parts of the kingdom, in search of foreign wheat, was very numerous in the early part of the month, and a large quantity of wheat was taken off the market on the 3rd instant. So active was the demand that prices were left, in a great measure, to the option of the seller, and the most irregular rates were asked and paid. We know of many instances in which an advance of 10s. per qr. was paid on the rates current only a week before, and a rise of 8s. per qr. was currently established. The country buyers having secured what they deemed requisite for their immediate wants, retired; and the local millers, being left to themselves, managed during the succeeding week to purchase 2s. to 3s. per qr. cheaper than they could have done during the temporary excitement.

On the 17th, we had again a good many strangers on the market, but they acted with greater circumspection; a good business was nevertheless done, and the currency of that day week was, in partial cases, exceeded by 1s. per qr.

Last Monday, the attendance was again rather numerous, but purchasers bought only in small quantities, hence it was found impossible to exceed previous rates. Very good Lower Baltic wheat was sold at 82s. to 83s., common descriptions at from 72s. up to 78s., and for Danzig and fine white America 83s. up to 90s. per qr. was realized. The market has become very bare of superior white wheat; such has consequently, of late, commanded relatively higher prices than red, of which the bulk of the supply has consisted.

The transactions in floating cargoes have not been so extensive as on some former occasions, owing no doubt to the abundance of the arrivals on the spot, and the fact that the prices asked have been relatively high. This was certainly the case until within the last week or so, but since the appearance of the Black Sea fleet off the coast (already alluded to), sellers have become somewhat more reasonable, and a good many contracts have consequently been concluded. Polish Odessa wheat has been sold at from 63s. up to 68s. per qr., cost, freight, and insurance, according to quality; fine Galatz at 70s. to 72s. per qr., and other sorts at corresponding rates. Part of the purchases made have been for Irish, some for Liverpool, and some for Birmingham account.

The offers from the Baltic have not been very numerous, and the prices asked, cost, freight, and

insurance, for fine red wheat from the lower ports, have been 78s. to 80s. per qr.

From Danzig there have scarcely been any offers.

No change has taken place in the nominal top price of town-manufactured flour since our last. The sale for the article has been slow throughout the month, which may be attributed in a great measure to the competition which our millers have had to contend against, American flour having been offered relatively cheaper than that of home make. The importations of the latter have not been nearly so large as earlier in the season, still there have been a good many anxious sellers, and though prices rose about 2s. per brl. in the commencement of the month, the article is at present lower in value than wheat or home-manufactured flour. Very good qualities are obtainable at 40s., and choice brands at 42s. per brl., being at the rate of 57s. 1d. to 60s. per sack; whilst household flour is held at 60s. to 65s., and town made whites at 63s. to 70s. per sack. No wonder, therefore, that American flour meets with the preference; indeed, the wonder is, that the consumption is not much greater, as the quality is exceedingly good this year.

Though it is almost certain that the barley crop has met with more or less injury from the protracted drought, this grain has excited very little attention. There was some activity in the demand in the early part of the month, but the enquiry was confined almost wholly to grinding qualities, malting and distilling sorts being comparatively neglected. The value of the latter has rather given way than advanced since our last, and 42s. per qr. may now be considered as the top price for English malting barley. The arrivals from abroad, though not large, have about sufficed for the demand, and with the exception of a rise of 1s. to 2s. per qr. on the first Monday in the month, no change has occurred. Very good Danish weighing 53 to 54lbs. per bush. has been offered at 36s., and the best descriptions may still be had at 38s. per qr. — certainly not a high price as compared with the value of other feeding articles.

The business in malt is usually limited at this period of the year, and the operations of the month have been on the most retail scale; there has, however, been no particular anxiety to press sales, and quotations have remained precisely as they were. The export demand for this article, as well as for ale and beer, has been checked by the recent unfavourable advices from Australia.

The arrivals of oats from our own coast, from Scotland, and from Ireland, have been scanty. On this side of the channel stocks appear to be almost exhausted, but we are inclined to think that this is

not the case in the sister isle; and we attributed the comparatively small extent of the receipts from thence to the fact that, owing to the high prices of other articles of food, and the scarcity of Indian corn, oatmeal is being more extensively consumed than usual; and this is likely, we think, to continue to be the case.

From abroad we have received large supplies, principally from the Danish Islands, from Sweden, and from Holland. The entire quantity which has arrived at this port has rather exceeded 70,000 qrs., of which 50,000 qrs. came to hand the week ending 22nd inst. Previous to this, the quantity was not sufficient to meet the demand, and the tendency of prices was upwards; indeed, the arrival alluded to did not check the rise. The greatest advance occurred on the 3rd inst., the improvement within the week terminating that day having been 2s. to 2s. 6d. per qr. On the succeeding Monday the dealers were not such free buyers, and black Irish (of which there happened just at that time to be a larger quantity on sale than of any other kind) receded about 6d. per qr. in value. During the following week there was a good steady trade, at full terms; and on Monday last there was a large sale to country purchasers, at prices 6d. to 1s. per qr. above those current on that day se'nnight. Quotations may, therefore, be considered to be fairly 3s. per qr. higher at present than they were at the close of March. Danes and Swedes are worth 29s. to 31s.; Dutch brews and Polands about the same; whilst fine Scotch and Irish may be quoted 33s. up to 36s. per qr. How the gap which the non-arrival of our usual Russian supply in July and August is to be filled up, it is difficult to conceive; and the probability appears to us to be, that prices of oats will rule unusually high towards the latter part of the summer and in the autumn.

The rise in oats, and the prospect of a further advance, have naturally caused attention to be directed to beans. Considerable purchases have been made in the London market from time to time, for shipment to the north, where the article seems to be much wanted. The supplies brought forward have, therefore, been quickly cleared off; and prices are at present 3s. to 4s. per qr. higher than they were at the end of last month.

Peas have not participated in the general improvement, which would appear singular were it not that prices were previously high, having been run up somewhat unduly during the winter months.

The arrivals of Indian corn from the Black Sea off the coast have not been large; but the Irish demand having been much less extensive than of late years, the supply has proved about equal to the inquiry, and quotations have undergone very little change. Later in the season we are likely to have

good receipts of this article from America, where stocks are reported to be considerable.

The fluctuations in prices of wheat at the principal foreign markets have naturally been in some measure in accordance with the changes here; but the rise or fall in the English markets have not been so closely followed as usual, the reduced state of the stocks at most of the continental ports having rendered holders ready enough to respond to any improvement, but not so willing to submit to any decline. That the last crop of wheat gave but an indifferent yield over the greater part of northern Europe is now quite certain, and the quality has also proved below the average of good years.

Danzig letters of the 21st inst. state that fine wheat, suitable for shipment to England, had become exceedingly scarce. The small quantities which had come down the Vistula from Poland had proved wholly unfit for export, and would have to be turned and worked in the open air to be brought into anything like good condition. The weight was generally very light, say 57 to 59lbs. per bushel; and good high-mixed qualities of 60lbs. weight could not have been bought below 68s. to 70s.; whilst the inferior light samples were quoted from 63s. to 65s. per qr. free on board, according to quality. Old wheat, of 60lbs. weight, had been sold the week before at 73s. per qr. free on board. Of really fine qualities there was hardly any on hand, and quotations were consequently nominal.

At Königsburg, very little appears to have been done for export during the month. The supplies of spring corn had not exceeded what had been required for local consumption.

From Stettin we learn that the stock of wheat in warehouse had been reduced to 17,000 qrs., and that supplies from the interior had come forward very sparingly. What had been received had disappointed the merchants; the weight, instead of being 60 to 61lbs., as expected, having amounted to only 58 to 59lbs. per bushel; and those who had made forward sales during the winter for delivery in spring, engaging to deliver 60 to 61lbs., would, it was thought, experience considerable difficulty in fulfilling the same. Good qualities of red wheat had found takers at 69s. to 70s.; white, of 59 to 60lbs. weight at 69s., and 60 to 61lbs. 72s. per qr. free on board. Spring corn of all sorts was scarce and dear: barley was bringing equal to 35s., and oats 25s. to 26s. per qr. for local consumption.

The accounts from Rostock, Stralsund, Anclam, &c., all agree in stating that the quantity of wheat in warehouse had, by the large shipments in the autumn and spring, been reduced into a very small compass, and that the shipments during the summer will be comparatively small. The price, free on

board, ranged from 69s. to 72s. per qr., according to quality, port of shipment, &c.

The weather appears to have been similar in the countries bordering the Baltic to that experienced here, and drought was beginning to be much complained of.

From Hamburg we learn that wheat on the spot had been in good demand, but for parcels at out-ports there had not been much inquiry. Moderately good qualities, weighing from 58½ to 59½lbs., had realized 71s. 6d. to 72s. 9d., and for 60½lbs. Wahren equal to 76s. 3d. per qr. free on board had been paid. Barley had rather receded in value; good 53lbs. quality from Denmark having been offered at 34s. to 34s. 3d. Oats had, on the other hand, been in lively request at advancing rates: 40 to 40½lbs. quality, from the Danish Islands, had brought 27s. 6d., whilst the lighter kinds had sold at from 22s. up to 25s. 6d. per qr. free on board.

From Holland we have nothing of interest to communicate. Trade was quiet, according to the latest advices, but prices had been tolerably well sustained. At Rotterdam, good to prime white Zealand wheat was quoted 75s. up to 79s. per qr. free on board. Of Rhine wheat there was scarcely any on hand.

The advices from France are, on the whole, firm; the Easter holidays had interfered a good deal with the regular course of business (as is usually the case), and the markets in the agricultural districts had been very indifferently supplied; but the demand having been slow, no improvement in quotations had taken place. It appears still to admit of question whether the trifling nature of the deliveries from the producers had been caused by the exhaustion of stocks, or by the holders holding back in expectation of higher prices later in the year.

At Havre the quality of American flour, though still large, had been materially reduced by purchases made by buyers from the interior, and the shipments made from time to time to England. Its value is, however, still relatively somewhat below quotations here, so that we may calculate on receiving some further supplies from thence.

At Marseilles stocks of wheat were not by any means heavy, and though the wind had been fair for arrivals from the Black Sea, the receipts had been quite trifling. The consequence had been that prices had rather tended upwards.

In the Italian states the crops are reported to have been injured by drought, and by the latest advices from thence prices of wheat and Indian corn were advancing.

In the Black Sea, business had been quite brought

to a stand, and quotations had become perfectly nominal.

A letter from Galatz states that no exports of grain had been permitted after the 19th of March. The stock on the spot was estimated to consist of 150,000 qrs. wheat and Indian corn, for which low rates would have been accepted.

From America we have advices of recent dates, from which it appears that the stocks of bread stuffs at all the principal ports on the sea board had been reduced into a very narrow compass, and that the supplies from the interior had not come forward so freely as expected.

New York advices of the 10th April state that, besides a good local demand for flour, several lots had been bought to ship eastward, and that fine Ohio and Michigan had brought rather enhanced terms. The accounts from Great Britain were considered discouraging, and the shipments in progress were not extensive. Common qualities of States flour were quoted 7 to 7½ dols. per barrel. Freight to London was 4s. to 4s. 3d., and to Liverpool 3s. per barrel.

That the quantity of bread stuffs still held in America is large there can be no doubt; but to attract supplies of consequence from thence, present prices must be at least supported.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter	
WHEAT, Essex and Kent, white.	76 to 78	fine 80 86
Ditto ditto new.	74	79 fine 81 88
Ditto ditto red.	74	79 " 83
Ditto ditto new.	71	80 " 84
Norfolk, Lincoln. & Yorksh., red. .	70	76 " 89
BARLEY, Malting, new. . 40 41	Chevalier. .	41 43
Distilling. . 37 39	Grinding. .	36 39
MALT, Essex, Norfolk, and Suffolk, new	65	67 extra 69
Ditto ditto old. . 64	65	" 68
Kingston, Ware, and town made, new	70	71 " 72
Ditto ditto old. . 68	70	" 71
OATS, English feed. . 27 30.	Potato. .	30 33
Scotch feed, new 31 32, old 33 34. .	Potato	31 36
Irish feed, white	29	30 fine 32
Ditto, black	22	28 fine 30
RYE	none	—
BEANS, Mazagan.	42 44	" 47 50
Ticks.	44 46	" 48 52
Harrow	46 48	" 50 54
Pigeon	46 52	" 54 62
PEAS, white boilers 57 58. . Maple 47 49	Grey 44 46	
FLOUR, town made, per sack of 250 lbs. .	—	" 66 70
Households, Town 63s. 65s. Country	—	" 62 64
Norfolk and Suffolk, ex-ship	—	" 55 60

FOREIGN GRAIN.

	Shillings per Quarter	
WHEAT, Dantzic, mixed. . 79 to 80 high mixed	83	85 extra 88
Königsberg.	77 79	" 80 " 83
Rostock, new	79 80	fine . . . 81 " 84
American, white.	80 85	red 77 80
Pomera, Meckbg., and Uckermark, red	75 78	extra. . . 80
Silesian.	75 78	white 79 81
Danish and Holstein	75 80	" none —
Rhine and Belgium.	—	old —
Odessa, St. Petersburg and Riga. .	63 71	fine 71 74
BARLEY, grinding 35 39	Distilling. .	39 41
Malting.	none	—

OATS, Dutch, brew, and Polands 29s. 31s. . .	Feed . .	27 29
Danish & Swedish feed 29s. to 31s.	Stralsund	30 32
Russian. 31 32	French. .	none
BEANS, Friesland and Holstein		42 48
Königsberg. . 47 50	Egyptian . .	45 47
PEAS, feeding	50	54 fine boilers 55 58
INDIAN CORN, white.	45 48	yellow 45 48
FLOUR, French, per sack (none) —	—	—
American, sour per barrel 37	40	sweet 40 43

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.

WEEK ENDING:	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
March 11, 1854.	79 6	38 7	27 2	19 5	45 2	43 2
March 18, 1854.	79 2	39 9	27 7	50 2	45 11	47 5
March 25, 1854.	78 4	38 6	27 5	53 2	45 0	47 7
April 1, 1854.	75 0	37 8	25 10	53 1	44 3	45 7
April 8, 1854.	73 5	36 2	23 11	48 9	44 3	43 1
April 15, 1854.	73 3	36 10	27 6	44 0	45 7	42 8
Aggregate average of last six weeks	77 3	37 9	27 3	49 9	45 0	45 9
Comparative avge. same time last year	44 11	31 8	18 10	31 1	131 4	32 10
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.		Averages from the corresponding Gazette in 1853.	
Qrs.	s. d.	Qrs.	s. d.
Wheat. 41,926	78 3	Wheat. 75,972	44 10
Barley. 31,021	36 10	Barley. 29,751	31 11
Oats 16,393	27 6	Oats 16,333	19 0
Rye. 145	41 0	Rye. 130	29 10
Beans. 4,686	45 7	Beans. 4,376	31 3
Peas 477	42 8	Peas 730	33 7

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING APRIL 15, 1854.



MONTHLY RETURN.

AN ACCOUNT SHEWING THE QUANTITIES OF CORN, GRAIN, MEAL, AND FLOUR, IMPORTED INTO THE UNITED KINGDOM IN THE MONTH ENDED 5TH APRIL, 1854. THE QUANTITIES UPON WHICH DUTIES HAVE BEEN PAID FOR HOME CONSUMPTION DURING THE SAME MONTH, AND THE QUANTITIES REMAINING IN WAREHOUSE AT THE CLOSE THEREOF.

Species of Grain.	Quantity imported.	Quantity entered for consumption.	Quantity remaining in warehouse.
	qrs. bush.	qrs. bush.	qrs. bush.
Wheat, from British Possessions	—	—	—
Barley, do.	—	—	—
Oats, do.	—	—	—
Peas, do.	4 6	4 6	—
Buck Wheat, do.	—	—	—
Wheat, foreign	567219 6	567219 6	140 6
Barley, do.	67513 1	67513 1	—
Oats, do.	141742 4	141742 4	—
Rye, do.	565 0	565 0	—
Peas, do.	6181 1	6181 2	—
Beans, do.	43729 3	43729 5	—
Maize or Indian Corn, do.	195839 3	195839 7	—
Buckwheat	49 0	49 0	—
Malt	—	—	—
Beer or Bigg	—	—	—
FLOUR from British Possessions.	23 1 25	23 1 25	—
FLOUR, foreign	600261 0 8	600261 0 8	—

PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.)... sowing —s. to 76s.; crushing 60s. to 64s.	
Linseed Cakes (per ton).....	£10 0s. to £10 10s.
Rapeseed (per qr.).....	70s. to 80s.
Ditto Cake (per ton).....	£6 15s. to £7 5s.
Cloverseed (per cwt.)..... (nominal).....	00s. to 00s
Mustard (per bush.) whitew 10s. to 14s., brown old 10s. to 13s.	
Coriander (per cwt.)..... new 10s. to 15s., old 10s. to 15s.	
Canary (per qr.).....	41s. to 48s.
Carraway (per cwt.)..... new 42s. to 44s., old 44s. to 48s.	
Turnip, white (per bush.) 14s. to 20s.....	Swede 24s. to 38s.
Trefoil (per cwt.).....	18s. to 24s.
Cow Grass (per cwt.).....	65s. to 76s.

FOREIGN SEEDS, &c.

Linseed (per qr.)... Baltic, 64s. to 68s.; Odessa, 66s. to 70s.	
Linseed Cake (per ton).....	£9 10s. to £10 10s.
Rape Cake (per ton).....	£6 15s. to £7 5s.
Hempseed, small, (per qr.).....	Ditto Dutch, 42s.
Tares (per qr.)..... new, small 58s., large 61s.	
Rye Grass (per qr.).....	28s. to 35s.
Coriander (per cwt.).....	10s. to 13s.
Clover, red.....	46s., 50s., 54s. to 56s.
Ditto, white.....	68s. to 80s.

HOP MARKET.

BOROUGH, MONDAY, April 24.

The trade during the past week has been somewhat more active, particularly for the best qualities of Hops, which bring fully as much money as on this day week.

WORCESTER, April 22.—There is more doing in our market to-day, and prices have improved 3s. to 4s.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

MONDAY, APRIL 24.

During the past week the arrivals have been moderate; but, owing to the continuation of warm weather and bright sunshine, the prices have had a downward tendency for most sorts.

	s.	d.	s.	d.	
York Regents	100	0	—	160	0
Forfarshire Regents.....	90	0	—	120	0
Perthshire ditto	80	0	—	110	0
Fifeshire ditto.....	80	0	—	110	0
Reds and Cups	80	0	—	90	0
Irish Whites.....	80	0	—	85	0
Rhenish ditto	80	0	—	90	0

BOROUGH AND SPITALFIELDS.

MONDAY, April 24.

Since this day se'nnight, the arrival of potatoes, coastwise and by land carriage, have been seasonably large and in fair average condition. The imports have been 3 tons from Limerick, and 174 do. from Rotterdam. The general demand is heavy, as follows:—York Regents, 115s. to 150s.; Kent and Essex ditto, 110s. to 130s.; Scotch ditto, 100s. to 120s.; cups ditto, 90s. to 110s.; Irish whites, 95s. to 100s.; foreign, 90s. to 100s. per ton.

COUNTRY POTATO MARKETS.—YORK, April 15: We had a good supply of potatoes, which sold at from 3s. 6d. to 3s. 10d. per bushel, 12d. to 13d. per peck.—LEEDS, April 18: We had a fair supply of potatoe. Wholesale, 14½d. to 15d.; retail, 16d. per 2½ lbs.—MALTON, April 15: A large supply of potatoes sold at 10d. per peck.—RICHMOND, April 15: Potatoes, 11d. per stone.—SHEFFIELD, April 18: Potatoes, 13s. to 15s. 6d. per load of 18 stones.—MANCHESTER, April 18: Potatoes, 11s. to 17s. 6d. per 252 lbs.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	s.	s.	Cheese, per cwt.	s.	s.
Friesland	110	to 112	Cheshire, new.....	66	to 80
Kiel.....	106	112	Cheddar.....	68	80
Dorset.....	101	116	Double Gloucester.....	60	70
Carlton.....	—	—	Single do.....	60	70
Waterford.....	—	—	Hams, York, new.....	72	84
Cork.....	—	—	Westmoreland.....	72	82
Limerick.....	86	96	Irish.....	70	78
Sligo.....	—	—	Bacon, Wiltshire, green.....	64	66
Fresh, per doz. 12s. 6d. 15s. 6d.			Waterford.....	60	63

ENGLISH BUTTER MARKET.

APRIL 24.

We note a good steady trade, and owing to the continued want of rain prices are pretty well supported.

Dorset, fine weekly	112s. to 114s. per cwt.
Do., middling	91s. to 96s. „
Fresh, per dozen lbs.....	11s. to 14s.

CHESTER CHEESE FAIR.—Cheese sold at 50s. to 60s., 64s., 68s. per cwt., and some as high as 73s. About 130 tons were pitched, which is considerably above the quantity at the April fair last year. There was a tolerably brisk sale towards the close of the fair, and but few lots remained unsold.

DAVENTRY CHEESE FAIR.—The supply of cheese was very limited, and the trade by no means brisk, several parcels having been taken away unsold. The average price was about 56s. per cwt., but one or two prime lots realized 70s.

RUGBY CHEESE FAIR.—There was about the usual supply of cheese. The trade was rather depressed. Good dairies made 50s. to 60s., a few prime ones reaching 65s.

BELFAST, (Friday last).—Butter: Shipping price, 95s. to 102s. per cwt.; firkins and crocks, 10½d. to 11½d. per lb. Bacon, 54s. to 60s.; Hams, prime 68s. to 72s., second quality 60s. to 64s. per cwt.; mess Pork, 87s. 6d. to 90s. per brl.; beef, 105s. to 112s. 6d.; Irish Lard, in bladders, 66s. to 70s.; kegs or firkins, 62s. to 64s. per cwt.

April	Butter.			Bacon.			Dried Hams.			Mess Pork.						
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.					
21.	78	0	84	0	38	0	40	0	65	0	70	0	76	0	77	0
1950.	86	0	90	0	43	0	44	0	60	0	63	0	60	0	60	0
1851.	74	0	78	0	42	0	46	0	56	0	60	0	67	0	67	0
1853.	93	0	102	0	56	0	78	0	70	0	70	0	87	0	87	0
1854.	95	0	102	0	51	0	63	0	68	0	72	0	87	0	87	0

CHICORY.

LONDON, SATURDAY, APRIL 22.

The supply of both English and foreign Chicory has rather fallen off this week; nevertheless, it is quite equal to the demand. In prices, we have no change to notice. They are, however well supported.

Foreign root (in £ bond) Harlingen	Per ton.			Roasted & ground	English.....	Foreign.....	Guernsey.....	York.....	
	£	s.	£						
10 10 11 0	10	11	0	16	0	20	0	28	0
English root (fine)	10	0	11	5	30	0	36	0	
Guernsey.....	10	0	11	5	25	0	28	0	
York.....	10	0	11	0	25	0	28	0	

YORK CHICORY MARKET, APRIL 21.—The Chicory market is without alteration in price, but the demand is good for this time of year. New and old root as per quality, £9 to £11 per ton.—Yorkshire Gaz-ette.

HAY MARKETS.

SATURDAY, APRIL 22.

SMITHFIELD.—A moderate supply, and a sluggish demand CUMBERLAND.—Trade steady, at late rates.

WHITECHAPEL.—Supply good, and trade tolerably firm.

At per load of 36 trusses.

	Smithfield.	Cumberland.	Whitechapel.
Meadow Hay	55s. to 106s.	54s. to 105s.	55s. to 106s.
Clover.....	75s. 120s.	75s. 120s.	75s. 120s.
Straw.....	30s. 43s.	37s. 41s.	30s. 43s.

COVENT GARDEN MARKET.

SATURDAY, APRIL 22.

Vegetables continue to improve, and all kinds of forced fruits in season are plentiful. New Grapes may now be obtained at 8s. to 15s. per lb. Strawberries realize from 6d. to 9d. per ounce; they are unusually abundant, and the demand for them is but limited. Pears are confined to Beurré Rance and Easter Beurré. Chestnuts are plentiful, as are also Cucumbers, at from 6d. to 1s. each, and some may even be had as low as 1s. a dozen. For Potatoes, except for best samples, trade is still heavy. The very best realize last week's quotations. Frame Potatoes fetch from 9d. to 1s. 6d. per lb. Asparagus from the open ground is good and cheap. Carrots and Turnips have not altered since our last report. Some good Broccoli comes from Cornwall, and also from the Continent. There is a large supply of French Lettuces, Carrots, and Artichokes. Ralishes fetch from 6d. to 8d. per bunch, Cos Lettuces at 6d. to 8d. each, Cabbage do, at 3d. to 4d. each, and Endive at 3d. to 4d. each. Green Gooseberries and Apricots are beginning to make their appearance. A large import of 40 Cucumbers has just arrived from Holland, and also good new Potatoes from Lisbon. Cut flowers consist of Camellias, Azaleas, Cyclamens, Hyacinths, Henths, Tulips, and Roses.

FRUIT.

Table listing various fruits and their prices, including Pineapples, Grapes, Apples, Pears, Oranges, Lemons, Almonds, Chestnuts, Walnuts, Nuts, Brazil, Spanish, and Cobs.

VEGETABLES.

Table listing various vegetables and their prices, including Cabbages, Broccoli, Greens, French Beans, Rhubarb, Potatoes, Turnips, Carrots, Cucumbers, Celery, Spinach, Beet, Onions, Leeks, Shallots, Garlic, Endive, Lettuce, Small Salads, Horseradish, Mushrooms, Sorrel, Artichokes, Fennel, Savory, Thyme, Parsley, Basil, and Watercress.

OILS.

Table listing various oils and their prices, including Olive, Lucca, Gallipoli, Spanish, Linseed, Rape, Palm, Seal, Ditto, Sperm, Head Matter, White, Greenland, Southern, Coc a Nut, and Palm.

WHALEBONE.

Table listing Whalebone prices for Greenland and South Sea.

PITCH.

Table listing Pitch prices for British, Archangel, and Stockholm.

TAR.

Table listing Tar prices for American and Archangel.

TURPENTINE.

Table listing Turpentine prices for Spirits, In Puncheons, and Rough.

RESIN.

Table listing Resin prices for Yellow and Transparent.

HIDE AND SKIN MARKETS.

SATURDAY, APRIL 22.

Table listing Hide and Skin market prices, including Market Hides, Horse Hides, Calf Skins, Keats, Half-breeds, Dones, Shearlings, and Lambs.

WOOL MARKETS.

BRITISH WOOL TRADE.

MONDAY, April 21.

Notwithstanding that we have no actual decline to notice in prices, it is evident from the present state of the demand, and the want of orders from the continent, combined with the limited shipments, that deep-grown wools would be sold on rather easier terms. Short wools are held at full prices; but the inquiry for them is trifling.

Table listing British Wool Trade prices for Southdown, Half-bred, Ewes, Kent, Combing, Flannel, Blanket, and Leicester Fleeces.

LEEDS ENGLISH WOOL MARKET, April 21.—There has been rather more inquiry for Lincolnshire wools, in which prices are quoted as stationary; in other combing wools there have also been some sales effected to supply the immediate wants of the manufacturers, who hold very light stocks, but purchase with extreme caution. In clothing wools there has been very little done during the present week.

LIVERPOOL WOOL MARKET, APRIL 22.

SCOTCH WOOL.—There is really no alteration to make in the market this week for any kind of Scotch Wool. Consumers only take supply for immediate wants, at rates in favour of the buyers.

Table listing Liverpool Wool Market prices for Laid Highland, White Highland, Laid Crossed, Laid Cheviot, and White Cheviot.

MANURES.

Table listing Manure prices for Peruvian Guano, Bolivian Guano, Peat Charcoal, Nitrate Soda, Nitrate Potash, Sulphate Ammonia, Mariate ditto, Superphosphate of Lime, Soda Ash or Alkali, Gypsum, Coprolite, Sulphate of Copper, and Salt.

THE FARMER'S MAGAZINE.

JUNE, 1854.

PLATES.

(For the descriptions see page 557.)

SANITARY IMPROVEMENTS.

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

It is not to the sanitary improvement of our dwelling-houses, but to the condition in which our live stock is often suffered to dwell, that I propose to address myself on this occasion. That in many places much improvement is necessary on this head, no one for whom these observations are written will feel inclined to dispute. The traveller in the districts to which I have alluded beholds yards with heaps of horse-dung piled up to the level of the stable windows; the stables deep with accumulations of ammonia-evolving dung; the roofs, void of eaves-troughs, pouring streams of rain into the yard; the drainage of that yard collected by a pond of dark liquid manure, in which the cows are standing, the swine wallowing, and the thirsty stock consuming.

To the ill-effects of this state of things upon our domestic animals, let us now turn our thoughts. First, then, as to the effects of long-continued accumulations of dung in close buildings. Of the pernicious results of confining stock in this way we have the evidence of those who have the most carefully attended to the box-feeding system. These skilful feeders have found that it is almost impossible to keep animals confined in this way for a long time over their own putrifying excrements without their health being materially injured. The late Professor Youatt (*On the Horse*, p. 115) attributed to the ammoniacal exhalations in close stables the inflammation of the eye, to which our horses are often subject. The natural cleanliness of the horse, his objection to eat after other animals, his preference for soft-water, are well known; and yet to confine him in places where every current of air comes to him surcharged with the gases of putrefaction is

deemed by many a matter of indifference. Then, again, as regards the sheep, whose native habitat is on the high and dry situated table-lands of Asia, how do we treat these? Follow a flock of South-downs into the low-lying soils of civilized life; notice how they are confined in rich rank grass, producing water-meads, or in deep fields of coleworts and turnips; penned in crowded folds and in sheep-yards, over deep accumulations of their own dung. Notice, I repeat, these things, and then let us consider if the sanitary conditions in which our live stock is perhaps of necessity placed may not be improved? at any rate we can hardly too often ask ourselves the question.

As I have on another occasion remarked, that clean water is to be preferred to foul, even for the beverage of a hog, is now pretty generally understood, even in those precincts of the metropolis where the true principles of health are more studied in cow-keeping or pig-feeding than in the preservation of their owner's health. Even animals have an instinctive knowledge of these things; for, as it is well said by Professor Lyon Playfair in a recent and most valuable report of the General Board of Health, horses have this knowledge in a remarkable degree; they love soft-water, and refuse hard if they can possibly get the former. Hard-water, indeed, produces a rough and staring coat in horses, and renders them liable to gripes. (This, too, was noted by one of the most celebrated of modern veterinarians, the late Professor Youatt). So much are race-horses influenced by the quality of the water, that it is not unfrequent to carry a supply of soft-water to the locality of a distant race-course, lest there being only hard-water, the horses should lose condition.

Cleghorn states that in the Island of Minorca, hard-water causes diseases in the system of certain animals, especially of sheep. It has been also observed that pigeons refuse hard-water if they can obtain access to soft. The preference which the horse very commonly shows to pond-water rather than to that procured from a well or a river may offer be explained in this way. The water of ponds is most commonly merely composed of the water which flows into it from land or surface drainage, which water, contrary to the generally received and apparently reasonable opinion, is upon an average much softer, as more free from the salts of lime than the waters obtained from either wells or rivers. Some late examinations instituted by the Board of Health have shown this in a very remarkable manner. It is observed in one of their reports (p. 85), "The observations already collected under the Public Health Act, of the comparative purity of different waters, appear to us to establish the axiom, that the shorter the space of land which water has to traverse, or the shorter the time which it remains upon it, the less will be the quantity of adventitious impurities which it will imbibe. We have had 424 different specimens of water from different parts of the country tested, and we find that in respect to hardness the following are the results—[a degree of hardness is equal to about a grain of chalk per gallon of water]:—1. Wells and springs (264 specimens) had an average hardness of 25.86. 2. Rivers and brooks (111 specimens), average hardness 13.05. 3. Land and surface drainage (49 specimens), average hardness 4.94."

If, again, we direct our attention to the effects of ill-drained lands upon the health of our domestic animals, we shall find there also much occasion for our serious inquiry. A lately published report of the General Board of Health contains many facts worthy of the farmer's consideration. They thus give the conclusions which they have obtained, as to the drainage of lands—[*Report 1854*, p. 90]:—

1. Excess of moisture, even on lands not evidently wet, is a cause of fogs and damps.

2. Dampness serves as the medium of conveyance for any decomposing matter that may be evolved, and adds to the injurious effects of such matter in the air; in other words, the excess of moisture may be said to increase or aggravate atmospheric impurity.

3. The evaporation of the surplus moisture lowers temperature, produces chills, and creates or aggravates the sudden and injurious changes or fluctuations of temperature by which health is injured.

The following are the chief agricultural advantages of land-drainage to individual occupiers or owners:

1st. By removing that excess of moisture which

prevents the permeation of the soil by air, and obstructs the free assimilation of nourishing matter by the plants.

2nd. By facilitating the absorption of manure by the soil, and so diminishing its loss by surface evaporation, and being washed away during heavy rains.

3rd. By preventing the lowering of the temperature and the chilling of the vegetation, diminishing the effect of solar warmth not on the surface merely, but at the depth occupied by the roots of plants.

4th. By removing obstructions to the free working of the land, arising from the surface being at certain times, from excess of moisture, too soft to be worked upon, and liable to be poached by cattle.

5th. By preventing injuries to cattle or other stock, corresponding to the effects produced on human beings, by marsh miasma, chills, and colds, inducing a general low state of health, and in extreme cases the rot or typhus.

6th. By diminishing damp at the foundations of houses, cattle sheds, and farm steadings, which causes their decay and dilapidation, as well as discomfort and disease to inmates and cattle.

It is true that the valuable observations of the Board of Health are chiefly confined to the ill effect of damp resting-places, bad air, and impure water to human beings; but how many of the following remarks of the report, to which I have before referred, well apply to the injurious conditions in which our domestic animals, and even our farm labourers, are placed:

"Within many of the towns we find the houses and streets filthy, the air fœtid; disease, typhus, and other epidemics rife amongst the population, bringing in their train destitution, and the need of pecuniary as well as medical relief, all mainly arising from the presence of the richest materials of production, the complete absence of which would, in a great measure, restore health, avert the recurrence of disease, and, if properly applied, would promote abundance, cheapen food, and increase the demand for beneficial labour. Outside the affected districts, and at a short distance from them, as in the adjacent rural districts, we find the aspect of the country poor and thinly clad with vegetation (except rushes, and plants favoured by a superabundance of moisture), the crops meagre, the labouring agricultural population afflicted with rheumatism and other maladies arising from damp and an excess of water, which, if removed, would relieve them from a cause of disease, and the land from an impediment to production; and if conveyed for the use of the town population, would give that popu-

lation the element of which they stand in peculiar need as a means to relieve them from that which is their own cause of depression, and return it for use on other land as a means of the highest fertility. The fact of the existence of those evils, and that they are removable, is not more certain than that their removal would be attended by reductions of existing burdens, and might be rendered productive of general advantage, if due means, guided by science and applied by properly qualified officers, be resorted to."

Later investigations of the subject have established two general conclusions applicable to the subject, that—

In towns all offensive smells from the decomposition of animal and vegetable matter indicate the generation and presence of the causes of insalubrity and of preventible disease, at the same time that they prove defective local administration :

And correlatively that—

In rural districts all continuous offensive smells from animal and vegetable decomposition indicate preventible loss of fertilizing matter, loss of money, and bad husbandry.

As *sanitary* results of the examination of the various means in practice of collecting, removing, and applying town manures, it appears—

1. That it is preferable to incur the total loss as manure of ordure and urine, or of animal and vegetable refuse in towns, than to allow it to be retained for occasional removal, to putrefy and create noxious gaseous impurities, amidst or near dwellings.

2. That there have been no trials of chemical substances, as "deodorisers" or "disinfectants," made on a large scale, which have been satisfactory as preventives; that impurities are created before such means can be applied, and when they are applied, the labour of applying them, and the expense of the materials used, equal or exceed the proper cost of effectual arrangements for the immediate removal of all offensive matter.

3. That it is a primary condition of salubrity that all ordure or town refuse should be immediately removed from beneath or near habitations, and that this object may be the most completely as well as economically effected by removal in water.

4. That it is far less injurious to the public health to have the refuse of towns in water in the next river than underneath or amidst dwellings.

5. That the application of manures to the surface of land by means of irrigation is less injurious than the application of the same quantities of manure in the common method as top-dressings; but that the common practice of irrigation with plain water is often productive of ague, and, when con-

ducted near dwellings, is otherwise injurious to health; and that the creation of largely extended evaporating surfaces from sewer water near towns (though still far less injurious than the retention of refuse, and its decomposition within towns and underneath habitations) ought to be avoided.

6. That the necessity of any such exposure is avoided by the conveyance of sewer water in closed impermeable pipes underground, and by its distribution by steam power, or by gravitation, through pipes, by jets, after the method of distribution of garden watering, or by shedding from a hose, whereby the extent of exposure to evaporation is so far reduced in amount and time, and the absorption by the land so immediate, that it is, as in garden cultivation, inappreciable in its effect on the atmosphere, or on the health of persons exposed to it.

As *agricultural* results, it appears from these examinations—

1. That the applications of a considerable proportion of the manures of towns in the liquid form, that is to say, as sewer water, have produced heavier crops than any other known description of manure; and that the superiority of a fourfold production of grass above the ordinary growth on similar soils has been maintained for upwards of half a century by means of the application of the sewer manure near Edinburgh and Milan.

2. That the like increase of fertility has been obtained by a similar application of the common farm manures in the liquid form.

3. That the great increase of the fertilizing power of manures, by their proper application in the liquid form, has been displayed on various descriptions of soil, on sands as well as on clays and loams, laid down with various descriptions of arable cultivation, but more particularly with green crops, and that the quality as well as the quantity of the produce has been improved.

4. That the ordinary augmentation of produce by the full application of the fertilizing powers of liquefied or liquid manures on grass land has been four and five-fold above the ordinary amount of production in this country.

5. That the chief advantages of the application of manure in the liquid form consist in the economy of the manure, in the promptitude of its action, in the prevention of the loss which occurs by its drying when applied in the solid form, in the like prevention of injurious emanations while it is preserved in solution in water, and in its being better fitted for quick absorption, and more readily carried beneath the surface of the soil to the roots of the plants.

6. That the method of distribution of liquid manure by steam power through fixed and flexible pipes, by jets or by shedding, is cheaper and more

effectual than any other yet practised, particularly for distribution on an extensive scale and at considerable distances.

7. That this mode of distribution has great advantage over the ancient method of irrigation by means of water-meadows, in requiring less original outlay than the particular method usually available, requiring less water, and applying the manure with less waste and with less danger to the public health, in not impeding pasturage, in not confining the land to one description of cultivation, and in being applicable alike to arable and grass lands.

8. That the apparatus for the distribution of liquid manure by means of steam or other power, through fixed and flexible pipes, will be equally applicable to the distribution of water on a large scale at a cheaper rate than by any other method yet known of supplying water to plants.

9. That, by the provision of the apparatus for the distribution of the manures of towns on a large scale in the liquid form, the necessity will be avoided of any considerable outlay for machinery or fixed capital on the part of the owners or occupiers of land, previously to the adoption of the improved methods of culture consequent on the use of sewer manures.

10. That, whilst the proper drainage of the land diminishes the losses arising from an excessive moisture, from continued rain or excessive floods, the apparatus of under-ground pipes, and the surface apparatus for the removal and application of sewer water or liquefied substances as manure, will equally serve for the application of simple water, and for the diminution of the losses and inconveniences which are occasioned to the agriculturist by the irregular falls of rain and long-continued droughts.

The chief economical results of high cultivation—as in the examples cited, to the extent of a four or five-fold produce, appear to be almost as if, for the payment of 6s. per acre of new annual charges for pipes, the fertility of three or four additional farms were put upon one; and also as if, at the same time, the fences and gates, and length of roads to be maintained, and the distance for the transport of materials and produce in the farm, and for other purposes, were reduced to one-fourth or to one-fifth of the ordinary proportions. In the neighbourhood of towns the economy of space for cultivation has peculiar advantages.

The reader will thus note, that in attending to the sanitary demands of civilization, the Board of Health have been far from unmindful of the interests of agriculture. The ill effects, indeed, of a neglect of sanitary precautions, in the case of our domestic animals—of placing them in situations so unnatural and so foreign to their natural habits, is too important a question to need any apology for its repeated discussion. We are startled, in the case of the smaller animals, by the rapid mortality produced from a neglect of ventilation, and omitting a supply of clean water. The keepers of cage birds, for instance, know this, and *act* upon their knowledge. The great poultry breeders are aware of the losses they sustain if foul water is consumed by their fowls; clean water they deem an essential necessity of the yard. The rapidly produced diseases, from a neglect of such measures, are monitors that will not, in the case of these birds, be disregarded; it is only because the larger animals are not so easily destroyed, that the ill effect is less noticed—their comfort and their natural tastes less studied by their owners.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A MONTHLY COUNCIL was held at the Society's House in Hanover Square, on Wednesday, the 3rd of May. The following Members of Council and Governors of the Society were present:—Colonel CHALLONER, Trustee, in the chair. Lord Berners, Lord Southampton, Hon. Colonel Douglas Pennant, M.P.; Hon. A. Leslie Melville, Sir John Villiers Shelley, Bart., M.P.; Sir Matthew White Ridley, Bart.; Sir John V. B. Johnstone, Bart., M.P.; Mr. Aldam, M.P.; Mr. Raymond Barker, Mr. Hodgson Barrow, M.P.; Mr. Barthropp, Mr. Blount, Mr. Bramston, M.P.; Mr. Brandreth, Mr. Cavendish, Mr. Evelyn Denison, M.P.; Mr. Druce (Eynsham), Mr. Foley, M.P.; Mr. Gadesden, Mr. Garrett, Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. C. Wren Hoskyns, Mr. Hudson (Castleacre), Mr. Lawes, Mr. Lawrence, Mr. Marshall, M.P.; Mr. Miles, M.P. (Leigh Court);

Mr. Milward, Mr. Sillifant, Professor Simonds, Mr. Thompson (Kirby Hall), Mr. Turner (Barton), and Mr. Wingate.

The following new Members were elected:—Archer, Heury, Barrowby, Grantham, Lincolnshire
Avery, T. R., Boscastle, Cornwall
Black, Edward, Benington Hall, Lincolnshire
Briggs, Benjamin, Scamblesby, Horncastle
Caffin, Joseph, Ighfield, Crawley, Sussex
Campion, R. G., Bushy Park, Rathcormack, Co. Cork
Carter, M. F., Newnham, Gloucestershire
Cassidy, Robert, Monastraven, Kildare, Ireland
Chamberlain, Henry, Narborough Hall, Swaffham, Norfolk
Cooper, John, Swineshead, Boston, Lincolnshire
Dale, Thurston G., Lincoln
Foster, William, Canwick House, Lincoln
Goulding, William, Cork, Ireland
Grove, Philip, Eastcote, Towcester, Northampton

Heighington, Edward, Woburn, Bedfordshire
 Ingall, William Caswell, Swineshead, Boston
 Jenkins, Rev. W. J., Fillingham, Lincoln
 Lindsay, Hugh Hamilton, Westdean House, Chichester
 Lutley, Samuel, Exeter, Devonshire
 Mac Allum, Thomas William, Belper, Derbyshire
 Maycock, Dottiin, Gumley Hall, Market Harborough
 Pierce, William, Cannon Street House, London
 Pipon, Captain M., Deerswood, Crawley, Sussex
 Revill, John, Barnley, Newark, Notts
 Sadler, T., Norton-Mains, Ratho, Edinburgh
 Saunders, John Henry, Abchurch Lane, London
 Sheldon, Henry, Brailes House, Shipston-on-Stour
 Spencer, Samuel, Snaresstone, Ashby-de-la-Zouch
 Stowell, Colonel Aleock, Kilbrittain Castle, Co. Cork
 Stuckey, Henry, Drayton, Curry-Rivall, Somersetshire
 Welch, Thomas Coleman, Pattishall, Towcester
 Williams, Richard, Swinley Court Farm, Tewkesbury
 Williams, William, Tyfry, Peutraeth, Anglesea, North Wales
 Wimbush, Barnes, Southgate, Middlesex
 Wodehouse, W. H., Woolmer's Park, Hertford.

FINANCES.—Mr. Raymond Barker, Chairman of the Finance Committee, submitted the report of the accounts, and the usual quarterly balance-sheets of the several branches of receipts and expenditure; the current cash balance in the hands of the bankers being £1,417.

COUNTRY MEETING OF 1855.—Mr. Raymond Barker, Mr. Fisher Hobbs, and Mr. Brandreth Gibbs, laid before the Council the Report of the Inspection Committee, which had visited the localities proposed by the authorities of Carlisle for the meeting of next year. The Mayor of Carlisle, Hon. C. Howard, M.P., Mr. Marshall, M.P., and Mr. Irving attended as a deputation from that city, and received the thanks of the Council for the local information they kindly supplied. The question of the final decision of the place of meeting was postponed until the ensuing Monthly Council, when the deputation would be enabled to present a report on the railway facilities that would be afforded to the Society's exhibitors of live stock and implements at the meeting proposed to be held at Carlisle.

COUNTRY MEETING OF 1858.—The district for the Country Meeting of this year being situate in the mid-eastern part, and that of next year in the northern part of England; that of 1856 north of London; and that of 1857 in the mid-southern part of England; the Council had that day, according to established custom, to determine the district for the Country Meeting of 1858. A deputation waited on the Council for the purpose of representing the agricultural claims of the county of Chester and of North Wales, to be included in the new district about to be formed. This deputation included Viscount Combermere, Earl Grosvenor, Hon. H. Cholmondeley, Hon. Col. Douglas Pennant, M.P.; Sir Philip Egerton, Bart., M.P.; Sir Watkin Wynn, Bart., M.P.; Mr. Tollemache, M.P.; Mr. Cornwall Legh, M.P.; Colonel Biddulph, M.P.; Major Pugh, M.P.; Mr. Egerton, M.P.; Mr. Meyrich, M.P.; Mr. West, M.P.; the Mayor of Chester, Mr. Humbeston, Mr. Roberts, Mr. George Chivas, Mr. John Churton, and Mr. H. Churton. They presented memorials from the landowners, magistrates, &c., in the counties of

Anglesea, Caernarvon, Denbigh, and Flint; from the magistrates, landowners, agriculturists, &c., in the county of Chester; and from the Mayor, Aldermen, burgesses of the city of Chester. The deputation having submitted these memorials, and explained at length the peculiar claims which the county of Chester and North Wales generally had upon the favourable consideration of the Royal Agricultural Society of England, on the motion of Sir John Shelley, Bart., M.P., a vote of the best thanks of the Council was offered to these noblemen and gentlemen for the warm interest they had expressed in the promotion of the objects of the Society, and the kind trouble they had taken in attending the Council on that occasion.—On the motion of Sir John Shelley, seconded by Mr. Raymond Barker, the Council then decided that the district for the country meeting of 1858 should consist of the whole of North Wales, including the counties of Chester, Stafford, and Salop.

REDUCTION OF EXPENDITURE.—Mr. Thompson, on the part of the Duke of Richmond, Sir John Shelley, Col. Challoner, and Mr. Fisher Hobbs, who, with himself, had presided over the meetings of the Reduction of Expenditure Committee, presented the final report of that committee; which being adopted by the Council, was referred to the several standing-committees of the Society, connected with the reductions proposed, in order that they might report the practical form in which such reductions could be carried into operation in the most satisfactory manner, without impairing the efficiency of the particular departments to which they respectively belong.

PRIZE ESSAYS.—Mr. Pusey reported from the Journal Committee the following awards:

I.—To THOMAS GEORGE BELL, LL.D., of Bellevue House, Gateshead, the Prize of Fifty Pounds for the best Report on the Farming of Durham.

II.—To JOHN COLEMAN, of Deene, near Wansford, the Prize of Thirty Pounds for the best Account of Under-Drainage. The Judges commended the Essay in this class bearing the motto "Res facta."

III.—To JAMES BUCKMAN, Professor of Botany in the Royal Agricultural College, Cirencester, the Prize of Twenty Pounds, for the best Essay on Agricultural Weeds.

IV.—To ISAAC SEAMAN, Veterinary Surgeon, Safron Walden, the Prize of Ten Pounds, for the best Essay on Giddiness in Ewes at Lambing.

The author of the essay, "Woodman spare that Tree," was requested to communicate his present address to the secretary of the Society.—Mr. Pusey also communicated suggestions for the subjects of the Essay Prizes for next year, to be determined at the ensuing monthly meeting.

ANALYTICAL CHEMISTRY.—Sir John Johnstone, Bart., M.P., presented the report of the chemical committee, which was adopted.—Mr. Thompson gave an interesting detail on the value of this privilege of chemical analysis to the members of the Society, and the reduced rates at which results were furnished to them for their guidance in the purchase of manures.—Mr. Fisher Hobbs hoped that the committee would suggest some uniform system for the enunciation of these results, when different chemists stated the analysis of

the same substance, in order that a comparison might be instituted and a practical inference deduced. At present he thought theoretical considerations led chemists too much away from the simple statement of fact in their results of analysis, and rendered their analyses intelligible only to scientific men, the simple element, the base into which that element entered, or the resulting salt, being furnished in many cases as equivalent exponents, while the general terms, organic or inorganic matter, &c., were considered sufficiently definite in others.—Mr. Paine stated his large outlay annually in the purchase of manures, and the corresponding large saving that he constantly effected by the assurance he gained on the one hand, or the warning on the other, from Professor Way's analyses of samples before purchase.

LINCOLN MEETING.—The Hon. Leslie Melville presented the report of the general Lincoln Committee, which was confirmed. The Council decided on the erection of a pavilion at the Lincoln Meeting, to accommodate 800 persons at dinner.

HOUSE-LIST.—The Council agreed to their house-list for the general meeting on the 22d inst., agreeably with the terms of the bye-laws.

STEWARD OF IMPLEMENTS.—On the motion of Mr. Fisher Hobbs, seconded by Mr. Hamond, Chandos Wren Hoskyns, Esq., of Wroxhall Abbey, Warwickshire, was unanimously appointed the steward-elect of implements at the Lincoln Meeting; in succession, on the retirement by rotation, of Sir Matthew White Ridley, Bart., the senior steward of implements at the Gloucester Meeting.

Communications were received from Viscount Palmerston, on the measures taken, on the representation of the Society, to arrest the progress of rabies among dogs; and on the analysis of sewerage matter: and from the Earl of Clarendon, on the occurrence of deposits of alkaline and earthy nitrates in Mexico. The Council ordered their best thanks for these communications.

Adjourned to May the 10th.

LECTURE ON MANURES, May 10.—Sir JOHN VILLIERS SHELLEY, Bart., M.P., Trustee, in the Chair.—Professor WAY, the consulting-chemist of the Society, delivered before the members a lecture "On the progress made in the manufacture of artificial manures," for which, on the motion of Lord Camoys, seconded by Lord Berners, he received the best thanks of the meeting. In the course of this lecture, Prof. Way offered suggestions, founded on scientific reasoning, for the increased efficiency and economy in the manufacture of artificial manures; and detailed, under the following heads, important and interesting facts connected with their respective production: viz., I. SOURCES OF AMMONIA: 1, Guano; 2, nitrate of soda and nitric acid; 3, bones; 4, blood; 5, flesh; 6, fish; 7, woollen rags, shoddy, and hair; 8, gas-refuse; 9, coal and soot; 10, urine; 11, elements of ammonia by electric or other agency (?). II. SOURCES OF PHOSPHORIC ACID: 1, Guano; 2, bones; 3, animal charcoal; 4, coprolites,

green sand, and phosphorite. III. PREPARATION OF MANURES. IV. Sewage. V. Superphosphate of Lime. He referred to the new modes adopted for obviating the inconvenient presence of a large proportion of water in blood and fish by working up those substances into manure; the importance of fishy matter as a substitute for guano, and the desirableness of commencing operations at once near home, instead of taking Newfoundland or other distant stations as an essential element into the arrangements; the plans proposed for separating ammonia from gas-liquor; the large amount of that alkali in coal and soot; the conditions under which the urine of towns may be most advantageously rendered available; the production of ammonia from the generation of nitric acid resulting from electricity passed through common air in contact with an alkali, and an account of the enormous amount of electricity given off by the hydro-electric battery; the unprecedented amount of adulteration at present existing in artificial manures, in many cases reaching 75 per cent. of adulterating matter, and particularly in supplies of guano sold to farmers as "new sorts" recently imported (these "guanos" in reality consisting of a small proportion of real guano, with a large proportion of gypsum, sand, ochre, chalk, and other adulterations); the bad economy of purchasing an inferior article at an apparently cheap rate, instead of a genuine article at a fair price; the mode of preparing guano and super-phosphate for the turnip crop; the consideration of sewage, not as a farmer's but as a townsman's question, its importance in a sanitary point of view being considerably greater than in an agricultural one, as the purchase of inferior sewage compounds would require a high-priced manure like sulphate of ammonia to give them the requisite efficiency for agricultural purposes; and concluded by giving a statement of the best conditions under which superphosphate could be made. Mr. Dyce Nicols referred to the importance of butchers' offal, and to the increased value of fishing villages on the north-eastern coast of Scotland, on account of their capability of supplying manuring matter.—Lord Berners stated that he had obtained a manure which had constantly yielded him results equal to those obtained on trial, side by side, with the best guano, and this was formed of saw-dust mixed with sheep-dung and urine, and then suffered to undergo fermentation.—The Earl of Essex inquired the proportion of soluble phosphate in superphosphate, when Prof. Way replied that the superphosphate yielding 12 per cent. was not bad, but that it often amounted to 16 or 17 per cent.—The Chairman remarked that no subject was at the present moment so interesting to all farmers as that of manures generally; that they were more dependent upon them day by day as agricultural improvement proceeded; although, as it appeared from what they had then heard, it was not always the best to buy the cheap article.—Mr. Raymond Barker agreed with their Chairman to a certain extent, but he hoped, at the same time, that the members would not leave that room with the impression that manure of any kind *must* be good because it was high-priced.

LECTURE ON ANIMAL DEVELOPMENT AS INDICATING AGE, *May 17th*. Mr. RAYMOND BARKER, V.P. (chairman of the veterinary committee), in the chair. The secretary having announced a communication from the Earl of Clarendon, informing the Society that a French Imperial decree had been issued abolishing the export duty on the manure manufactured in Paris, under the name of *Poudrette*; and a present from the East India Company of a supply of fresh Deodara Pine seeds from the Himalayan district of India, well adapted for growing useful and ornamental timber on the poor hilly or well-drained soils of this country; Professor Simonds, the Veterinary-Inspector of the Society, proceeded to deliver the first part of his Lecture on the Indications of Age, furnished by the structure of the teeth and the general developments of growth in cattle, sheep, and pigs. On this occasion, he confined himself to the indications furnished by cattle, reserving for his second lecture the consideration of those connected with sheep and pigs. The discussion of the various points brought forward was of the highest interest in a scientific and practical point of view, and their elucidation strikingly promoted by the lecturer's continual reference to a great number of coloured diagrams on a large scale. He particularly alluded to two of the results of his own investigations on the structure of the teeth, as being, he believed, perfectly new to physiologists. 1. After describing the dentine enamel and crusta petrosa as the constituents of the teeth, and also explaining the so-called osteo-dentine, he remarked that the latter substance did not fill the pulp-cavity in an old tooth of any of the domestic Herbivora. The obliteration of this cavity is effected by the pulp continuing to form dentine, and not by its ossification or conversion into osteo-dentine, as stated by writers on the structure of the teeth. 2. In proportion as the pulp diminished, so was the supply of nutrition to the tooth cut off from the inside, and to provide for this the dentinal tubes in the fang became changed into bone-cells; or in other words, the crusta increased at the expense of the dentine, and thus the tooth drew its nourishment from the blood sent to the sockets in which the teeth are embedded.

In reply to a question by Sir John Johnstone, Professor Simonds had no doubt that the teeth of horses would, to a certain degree, be affected by the same general forcing system; but at that time, no data connected with that point had been collected, and he was consequently unable to give more than a general opinion of the probable result of the adoption of such a course in the case of the horse. On the motion of Mr. Towneley, second by Sir John Johnstone, the best thanks of the meeting were then voted to Professor Simonds, for the very able and interesting discussion of facts he had submitted to them.—The Chairman announced that the concluding part of the lecture would take place at 12 o'clock on Wednesday next; and that Professor Way's lecture, fixed for the 31st of May, would be postponed, in consequence of the Derby-day at Epsom falling on that date.

Monday, May 22, in Hanover-square. The chair was taken at twelve o'clock by Mr. Raymond Barker, V.P.

The proceedings commenced with the reading, by the Secretary, of the bye-law with regard to elections.

The CHAIRMAN said the first business on the agenda was the election of a president of the society for the year ensuing the Lincoln meeting; and he was sorry that there were not more members present to take part in that interesting portion of the proceedings. It was difficult to ascertain the wishes of so large a body on that subject; but in bygone years individuals had been chosen for the office, who, by the manner in which they had discharged its duties, fully justified the selection. Hitherto it had been their good fortune to have at their head noblemen and gentlemen who had rendered good service to the society. As regarded the president of the year, Mr. Pusey, who now occupied the chair for the second time, and to whom the society was under such great obligations for all that he had done for it (cheers), the council had great pleasure in proposing him, for they felt—at least he himself felt—very strongly, that it would hardly be possible to select any one whose name would be more acceptable to the county into which the society was shortly going, than that of Mr. Pusey, who had done such good service to that county by the interest which he had taken in the drainage question. Family affliction prevented Mr. Pusey from attending there that day, and hence had devolved upon him (the Chairman) the duty of taking his place. He knew it was the wish of Mr. Pusey, as it was that of most persons in the council, that politics should exercise no influence in that society. It had sometimes been thought that they ought to avoid too close an adherence in the elections to the office of president of persons holding one particular line of politics—that there should be such an intermixture as would prevent any dissatisfaction on that point. It must be admitted that for the last three years the presidents had been all of one class of politics. The best principle to adopt, however, in such a case, was that of choosing those who had done the society good service (Hear, hear). Now it was the feeling of many that good service had been rendered by a gentleman who had not had any mark of gratitude shown him for his services except in having recently been placed on the list of vice-presidents. It was, indeed, felt very generally that as a great agriculturist, representing a large portion of the agricultural body in his own locality, and as one who took upon himself the arduous office of one of the stewards of the implement yard at the first meeting of the society, an office which he continued to hold for some years, the gentleman to whom he referred had a strong claim to the honour which it was now proposed to confer upon him. He held in his hand a letter from Lord Portman, whom, under other circumstances, he should have felt great pleasure in proposing, in which his lordship said he would rather that he himself were passed by, in order that the honour might be conferred on the gentleman in question. With these observations, he (the Chairman) begged to propose William Miles, Esq., one of the vice-presidents, as the president for the ensuing year.

The half-yearly meeting of this society took place on

Mr. W. F. HOBBS felt great pleasure in seconding the proposal, and thought the society would be quite right in selecting a gentleman who had from the commencement rendered it such good service. There were occasions on which it was desirable to deviate from the rule which had been laid down, of selecting the presidents from the peers of the realm. Such an occasion arose last year. No more popular selection could have been made than that of Mr. Pusey; and, considering the good service which Mr. Miles did the society in its infancy, the election of that gentleman for the ensuing year was no more than was due to him.

The CHAIRMAN having asked whether any one in the meeting had any other gentleman to propose for the office of president, and there being no reply,

The motion was put and carried unanimously.

Mr. CHAPMAN proposed the re-election of the trustees, the only alteration in the list being the substitution of the name of Sir J. V. Shelley, M.P., for that of the late Mr. Clive.

Mr. KILBY, in seconding the motion, said, in doing so he wished to make one observation. In his neighbourhood there was great doubt as to what meetings of the society the members were entitled to attend. For example, they did not know whether or not they might attend the council meetings. He thought it would be a great advantage to members if when they came up to town they could attend the council meetings as auditors, seeing that a variety of topics were introduced which were interesting to agriculturists generally. He wished to know at what meetings subscribers were really entitled to be present.

The CHAIRMAN was very sorry to find that the gentleman had lived so much in the dark on this subject (laughter). The council had taken pains to give all requisite information: in point of fact, not only was it open to all members to attend the weekly meetings of the council, but the council always felt very much obliged to them for attending. Strictly speaking, only members of the council had a right to take part in the discussions, but the topics discussed were generally of such a nature that the council were glad to hear any one who could assist in elucidating them. The only meetings to which members were not admitted were special ones.

The SECRETARY said the true state of the case was constantly published in the society's Journal.

The motion was then put and carried.

On the motion of Mr. Wingate, of Lincolnshire, seconded by Mr. Orlebar, the vice-presidents were re-elected.

The meeting then proceeded to the election of the council for the ensuing year, Mr. Lewis Fyche, of Thorpe Hall, Lincolnshire, acting as scrutineer. The result was that the house list was elected unanimously.

The following gentlemen were chosen as new members of council:—Mr. C. W. Hoskyns, Sir A. K. Macdonald, Bart., Sir C. G. Morgan, Bart., Sir S. H. Northcote, Bart., and Sir W. W. Wynne, Bart., M.P.

The SECRETARY (Mr. Hudson) then read the following Report of the Council:—

REPORT.

The Council have to report to the Society at its present half-yearly Meeting, that since December last the names of 88 members have been removed from its list by resignation or death, while, during the same period, 175 new members have been elected from the following localities:—

Lincolnshire	29	Cumberland	2
Middlesex	19	Dorsetshire.....	2
Gloucestershire.....	16	Essex	2
Lancashire	6	Herefordshire.....	2
Surrey.....	6	Herts	2
Hants	5	Leicestershire.....	2
Kent	5	Monmouthshire.....	2
Northamptonshire.....	5	Rutlandshire	2
Suffolk	5	Staffs	2
Sussex	5	Cheshire.....	1
Yorkshire	5	Cornwall.....	1
Derbyshire.....	4	Huntingdonshire.....	1
Devonshire.....	4	Salop	1
Norfolk	4	Westmoreland	1
Notts	4	Worcestershire.....	1
Oxfordshire.....	4		
Somersetshire.....	4	Wales	4
Berks	3	Scotland.....	4
Warwickshire.....	3	Ireland	5
Beds	2		

The Society now consists of a total amount of 5,177 members, comprising—

88 Life-Governors,
146 Annual Governors,
771 Life-Members,
4,152 Annual Members, and
20 Honorary Members.

The Council have elected Sir John Villiers Shelley, Bart., M.P., to fill the vacancy in the class of Trustees occasioned by the lamented decease of the Hon. Robert Henry Clive; and they have taken measures for extending to the principality of Wales, and to the counties of Lancaster, Warwick, and Monmouth, that representation in the Council to which they would seem to be entitled, on account of the large proportion of members of the Society residing within their respective districts.

The invested capital of the Society consists of £10,764 stock in the Three-and-a-Quarter per Cents.; every claim against the Society presented in a complete form for payment has been discharged; and the arrears of subscription have assumed during the last few years a much more reduced and manageable shape. The subscriptions remaining unpaid from the 1st of January, 1853, amount to £840, and are now in the course of collection; while those which remain unpaid from the 1st of January in the present year, amount to £2,994, and will no doubt in a short time be duly paid up and available for the current purposes of the Society.—The Council appointed in February last a special committee for the purpose of conferring with the Finance Committee on the best means to be adopted for placing the financial arrangements of the Society under a more economical system. That committee, having instituted a searching inquiry into every branch of the Society's expenditure, has this month made its report to the Council; who have the satisfaction to find that no unnecessary outlay appears to have been incurred in carrying out, under the orders of the Council, the various operations of the Society. As a large amount of shedding, however, has frequently been provided, at great

expense to the Society, for the express accommodation of stock and implements which have not been sent to the show according to their original entry, the Council have adopted the special recommendation of the committee, that all persons who shall neglect to pay in due course the stated fines incurred for such non-exhibition, shall be debarred from exhibiting at the future country meetings of the Society.

At the Lincoln Meeting, to be held in the week commencing Monday, the 17th of July, the Council anticipate a large and important agricultural assemblage. The entries of implements and machinery are as numerous as in former years; and their trial will on that occasion for the first time be open, under certain regulations, to the public, from the noon of Thursday in the previous week. The dinner of the Society will take place in a pavilion constructed to accommodate 800 persons. The Council last year appointed a committee to report suggestions on the subject of that over-fed condition of animals which, in many instances at previous meetings, had been animadverted upon as being inconsistent with their value as stock intended for breeding purposes. The arrangements, however, made by that committee have not attained the object in view. The disqualifications pronounced at Gloucester were not eventually confirmed in every case; animals apparently over-fed at the time having subsequently been proved to be breeding stock. The Council have, therefore, reverted to the Society's original rule of placing on the judges of the show the responsibility of awarding the prizes to those animals which, in their opinion, are best adapted for the purposes of breeding.—Professor Simonds, the veterinary-inspector of the Society, having instituted at its country meetings a complete comparison between the certified ages of the cattle, sheep, and pigs exhibited on those occasions, and the developments of their growth, has recently delivered before the members the first part of his lecture on that subject, in which he has shown within what limits high feeding will accelerate the development of the teeth in cattle, and has thus furnished us with the ready means of clearing up doubts that have hitherto frequently arisen at the country meetings, in reference to the exact age of animals competing for the prizes of the Society.—The subject of the feeding of animals continues to engage the attention of Mr. Lawes, whose recent experiments, placed on record in the pages of the Journal, supply still further evidence of the labour and expense attending investigations of that kind, and which can only be duly estimated by those who, like Mr. Lawes, have undertaken them on a large scale for the public good.

The district for the country meeting of the Society in 1858 has been decided by the Council, on representations made to them by large and influential deputations from North Wales and the county and city of Chester, to be comprised of the whole of North Wales and the counties of Chester, Stafford, and Salop.

The Council feel deeply indebted to the Earl of Clarendon, H.M. Principal Secretary of State for the Foreign Department, for the personal interest he has taken in promoting the objects of the Society, by instituting such inquiries abroad as might lead to the dis-

covery of supplies of guano, or of the alkaline and earthy nitrates in Mexico and other tropical districts; also, to Sir James Graham, who, as first Lord of the Admiralty, has directed extensive search to be made by her Majesty's ships cruising within the tropics, for those or any other natural deposits that might prove advantageous as manuring matter. They have at the same time to acknowledge the continued interest evinced in their proceedings by Viscount Palmerston, H.M. Principal Secretary of State for the Home Department, and his lordship's kindness, in communicating to the Society, from time to time, whatever information may appear in any degree conducive to the advancement of agriculture in this country.—The Council have reason to hope that the public attention, which 17 months ago was called to the importance of a substitute for guano, by the prize offered by the Society, has not been entirely unavailing; for such a discovery, although within the range of physical possibility, was not to be expected at once to reward the investigation of the chemist, or the extended research of the naturalist. The general consideration, however, which this subject has now received has led to the closer study of the action of manuring matter, and to a more exact estimate of the conditions under which such a substitute may most favourably be produced. These inquiries have confirmed the essential importance of phosphoric acid and ammonia, and pointed out sources from which it is hoped that cheaper supplies of the latter substance may be obtained. One hundred and forty-three applications have already been received from different parts of the United Kingdom and foreign countries, claiming the prize offered by the Society. Each of these claimants professes to supply a manure equal in fertilising properties to Peruvian guano, at a price not exceeding £5 per ton, and in quantities sufficient for all demands. Before, however, the Council can proceed to the consideration of these claims, they require a compliance with all the conditions under which the prize was offered; and until the most undeniable evidence of the true value of any competing manure has been produced, and subsequently tested if necessary by special trials, the Society may feel assured that the Council will take no step on this important subject that may tend in any degree to mislead its members.—Professor Way, the consulting chemist to the Society, has recently delivered before the members a lecture on the manufacture of artificial manures, highly suggestive of sources whence supplies of manuring matter may be derived, and of improved modes of its manufacture into artificial mixtures for special crops. He reports from his own experience that the amount of adulteration in guano and other manures at the present time is greater than at any former period since his connexion with the Society, the adulterating material amounting in many cases to three-fourths of the whole compound sold to farmers as genuine manure.

The Council, in conclusion, congratulate the members on the clear gain of 254 more names on its list at the present time than at the same date in last year; and they are assured that the Society will not on this occasion review its own prosperity, and the gradual fulfil-

ment of its practical and scientific objects, with less satisfaction, when informed that the collateral progress of the same national cause of agricultural improvement is advancing with equal steps in the sister-kingdoms of the empire.—By order of the Council,

JAMES HUDSON, Secretary.

Mr. WINGATE, in moving the adoption of the report, enquired whether any step had been taken with the view of securing a diminution of expenditure.

The CHAIRMAN replied that the matter would be left to the special committees, who would each in their respective departments consider and report what reductions could be carried out.

The motion having been seconded by Mr. B. ALMACK, was agreed to.

The CHAIRMAN, in his character of chairman of the Finance Committee, then presented the following balance sheet:—

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Half-yearly Account, ending the 31st December, 1853.

RECEIPTS.		£	s.	d.
BALANCE in the hands of the Bankers, 1st July, 1853.....		2249	15	11
BALANCE in the hands of the Secretary, 1st July, 1853.....		39	6	3
Dividends on Stock.....		169	16	5
Life-Compositions of Members.....		190	0	0
Annual Subscriptions of Governors.....		60	0	0
Annual Subscriptions of Members.....		1249	0	0
Receipts on account of Journal.....		148	6	3
The late Hon. R. H. Clive's Special Prizes for Shropshire Down Sheep.....		50	0	0
Mr. Pusey's Special Prize for Water-drill.....		10	0	0
Receipts during the half year on account of Country Meetings (including the subscription of £1500 from the authorities of Lincoln)....		3093	3	5
		<hr/>		
		£7264	8	3

PAYMENTS.		£	s.	d.
Permanent charges.....		178	12	6
Taxes and Rates.....		13	19	2
Establishment.....		477	8	5
Postage and Carriage.....		15	5	0
Advertisements.....		10	3	9
Journal Expenses.....		1164	9	10
Veterinary Investigations.....		20	9	6
Chemical Grant (half a year).....		100	0	0
Chemical Investigations (half a year).....		150	0	0
Prizes of the Society.....		1560	6	0
The late Hon. R. H. Clive's Special Prizes for Shropshire Down Sheep.....		50	0	0
Mr. Pusey's Special Prize for Water-drill.....		10	0	0
Payments during the half year on account of Country Meetings.....		2336	13	6
Sundry items of Petty Cash.....		5	3	11
Outstanding Cheque, cashed.....		50	0	0
BALANCE in the hands of the Bankers, 31st December, 1853.....		1107	8	10
BALANCE in the hands of the Secretary, 31st December, 1853.....		14	7	10
		<hr/>		
		£7264	8	3

(Signed) THOMAS RAYMOND BARKER, *Chairman.*

Examined, audited, and found correct, this 19th day of May, 1854.

(Signed) THOMAS KNIGHT,
GEORGE I. RAYMOND BARKER, } *Auditors.*
GEORGE DYER,

On the motion of Mr. DYCE NICOL, seconded by Mr. B. ALMACK, thanks were voted to the auditors for the

care which they bestowed on the examination of the Society's accounts.

Mr. DYER, as one of the auditors, briefly returned thanks for himself and his colleagues.

Sir J. JOHNSTONE, M.P., moved a vote of thanks to Professor Way and Professor Simonds for the excellent lectures which they had delivered to the members. In doing so, he took occasion to advert to a lecture delivered on the preceding Wednesday by Professor Simonds on the teeth of cattle, illustrated by diagrams which were still suspended on the walls of the room, and to be followed by another on the same subject on the succeeding Wednesday. These lectures were, he observed, of great practical interest to farmers; while that of Professor Way, with regard to the substitution of some cheap manure for guano, was equally important. These gentlemen were both entitled to the cordial thanks of the meeting. (Cheers).

The motion was seconded by Mr. GRANTHAM, and agreed to.

The CHAIRMAN said the business of the agenda having been gone through, if any gentleman wished to make any remarks, or to offer any suggestion to the Council, this was the proper time for him to do so, and anything which might be said would be duly considered.

Mr. ORLEBAR said he had long thought that if the prize offered by the Council for a more economical application of steam as a motive power in agriculture were made larger in amount, it would perhaps be the means of inducing mechanicians to turn their attention more decidedly to the matter. Feeling—in common, he believed, with a great many other members of the Society—that it would be a great benefit to the country at large if steam could be economically and efficiently employed as a motive power in the use of ploughs and other agricultural implements, he would suggest to the Council to consider whether it might not be desirable in the course of the next year very much to increase the amount of the prize, so as to make it better worth the while of engineers and others to apply their minds to the subject.

The CHAIRMAN said before the prize of £200 was offered, a great deal of discussion took place both with regard to the amount and with regard to the period during which the matter should be open. In dealing with the question the state of the finances was necessarily taken into account; for, what with one expense and another, it was really difficult to find the requisite amount of funds to carry on all the Society's operations. (Hear, hear). What Mr. Orlebar said, however, was well worthy of consideration; and he had no doubt that when the appropriation of the funds of the ensuing year had to be decided upon, the question would be re-opened, and it would be considered whether or not it were desirable not merely to increase the amount, but also to extend the period. He could not speak so confidently with reference to traction as with regard to the finances. Mr. Hobbs, perhaps, could explain more fully than himself the views which the Council entertained with regard to this prize.

Mr. W. F. HOBBS was glad to have that opportunity of making a few remarks on this important subject. The Implement Committee had watched with great interest for the invention of some substitute for the spade and the plough, to be worked by steam-power. They knew that the offer of a prize of £500 or £1,000 would look very well on paper, and that it might have the effect of turning the attention of mechanics to the subject with increased interest; but in the present position of the Society's finances they felt that they would not be justified in offering a larger prize than £200 for a machine which would be a good substitute for the plough or the spade, to be impelled by steam-power; and they were confident that there was so much emulation and public spirit among the agricultural implement makers of the present day, that they would not be debarred by the small amount of the prize from competing for it in 1855, when the prize would be awarded. He was not aware that hitherto any very great amount of talent had been devoted to the matter. He would here observe that he should be very glad to see two or three thousand additional members, in order that the Society might be in a position to offer larger premiums for improvements. He threw this out as a hint. It was a mistake to suppose that the Society was rich; but if every member were to exert himself, as some members had done, to obtain an accession to their number, the Society would no doubt ultimately be able to offer as liberal a prize in this case as it had done when its object was to secure a cheap substitute for guano. As might be seen from the balance-sheet presented that day, although they were in a safe position, they were still not in a position to offer such prizes as a great national society like that was naturally desirous of offering for the promotion of agricultural improvement. For himself he could only say that as a steward in the implement department at Lincoln, he hoped the members present at the meeting would take that opportunity of convincing themselves that the judges applied the most rigid tests to machines before recommending them to the public; and he should be most

happy if gentlemen who were connected with mechanical science would throw out hints on the occasion which might prove useful to the judges in the discharge of their duties. He wished to state that in the mechanical world it was not considered that anything so near perfection could yet be attained in the implement to which he had referred as to justify them in giving a prize of five hundred or a thousand pounds. (Hear, hear). All the implement makers in this country, and he believed those in America too, thought it would take years and years—even longer than the period required in the case of the reaping machine, which was still very imperfect—to bring to anything like perfection a machine which would be a good economical substitute for the spade and the plough. (Hear, hear). Therefore the offer of £200 in the first instance—he really believed the Council would have offered a little more if they had had sufficient funds—was to be looked upon as a means to an end which was yet perhaps rather remote, that end being the securing of a first-rate machine which would economically do the work now done by horses and ploughs at so great a cost to the farmer. If there were nothing more to be said on this subject, he would now propose a vote of thanks to the Chairman. (Hear, hear). Their chairman was a practical man, and he felt great pleasure in moving a vote of thanks to him, not merely on account of his services on that occasion, but also on account of the great care and labour which he was in the constant habit of bestowing on the affairs of the Society, more especially as the head of the Committee of Finance.

Mr. WINGATE seconded the motion, which was put by Sir J. JOHNSTONE, and carried.

The CHAIRMAN said, having been connected with the Society from the day of its formation, it was a great gratification to him to receive such a reward, believing as he did that it came from the heart. He then stated that in consequence of Epsom Races occurring on the 31st of May, Professor Way's next lecture would be postponed till Wednesday the 14th of June.

This terminated the proceedings.

GLOUCESTER CHEESE.

Mr. Hayward, of Frocester Court Farm, has given his experience as a cheese-maker in the Vale of Berkeley: it is a valuable document.

Management of Cows.—The cows are generally turned out to grass in the end of April or beginning of May, upon those grounds which Mr. Hayward has found, from experience, to produce the most and the richest milk. These grounds are nearest to the homestead, and have always been pastured. The driving of the cows before milking, and the carrying of the milk to any considerable distance, are found to injure the quality of the cheese; and to avoid this consequence, the pasture grounds should always be, as on this farm, near the homestead.

The cows on this farm are divided into three lots, the young and weak ones being in one lot. Each of these three lots has two fields of pasture, and they are generally kept a week at a time in each field, so that they have fresh pasture every week—an advantage much greater than most farmers are aware of. Great care is taken never to over-stock the pasture of the cows. They ought, at all times, to have a full bite of close, short, fine grass. Long over-grown grass gives a rank flavour to the cheese, and should always be avoided.

In dry seasons, when the pasture has got too short, some of the fields that were intended for mowing are given up to the cows for pasture. When the hay is all cleared off the mowing grounds,

and the after-grass begins to grow (it generally takes several weeks to make much appearance), the cows are shifted into these grounds. Land which is long pastured by any animal gets foul or unsound for it, and the after-grass always makes the cows spring their milk. They are, therefore, generally moved from the pasture grounds into the after-grass before there is much of it for them.

It is very essential for cows to have a shade and water in every field. The shade of trees, however, is the only shelter from the sun and storm which they have on this farm, and indeed in the whole vale.

Pigs.—Upon this and every dairy farm a number of pigs is necessary to consume the whey—one pig to two cows in summer, but not so many in winter. Their food in summer is grass, clover, vetches, and whey; in winter, raw potatoes, with tailing corn, whey, and skimmed milk. When they are being fattened, bean or barley meal is mixed with boiled or steamed potatoes, in the proportion of a bushel of meal to two cwt. and a half of potatoes. The breed of pigs kept on this farm is the Berkshire, with a small mixture of the Hereford. Some of them are sold in a store state; most of them are fattened. Five or six breeding sows are always kept, which are regularly fattened off, when one year and a half old, and fed to about three cwt.

MANAGEMENT OF THE DAIRY.

It is acknowledged by every one at all acquainted with the subject, that the quality of cheese does not depend upon the superior richness of the soil or the fineness of the herbage; for cheese of the first quality is frequently made from land of an inferior description, and from herbage of a coarse nature. Nor does the quality of the cheese depend on the breed of the cows; for cheese of the best quality is made from the milk of cows of all the different breeds that are to be found in the country. We think it principally depends on the management of the cows as to their food, &c., of the milk in converting it into cheese, and of the cheese till it is fit for market.

The following circumstances are injurious to the quality of cheese:—Allowing the cows to get rank or ill-flavoured grass or hay, these conveying a bad flavour to the milk and cheese; allowing the cows to run and heat themselves; driving them far to be milked, which makes the milk froth much in milking; carrying the milk from the place of milking to the dairy; and allowing it to remain long after it is milked, before it is set with the rennet.

The greatest dependence is upon the dairy-maid; and the chief art of making cheese of the finest quality lies in her management. The superintendence of the dairy invariably devolves upon the farmer's wife. Mrs. Hayward attends to every minute circumstance in this department; and the

following is a report of the information she has obligingly communicated to us respecting the whole economy of the dairy of this farm.

The management of a dairy should be conducted with the greatest regularity. Every operation should be performed precisely at the proper time. Either hastening or delaying the execution of it will cause cheese of an inferior quality to be made of milk from which the best may be obtained. A dairy-maid is selected for skill, cleanliness, and strict attention to her business. Her work commences at four o'clock in the morning, and continues without intermission till bed-time.

Dairy-house.—The dairy-house should be kept at a temperature of between 50° and 60°; and the dryer it is kept the better, as both milk and cream retain their sweetness much longer in dry than in damp air. Every time, therefore, the dairy is washed, it is dried as quickly as possible.

Around two sides of the dairy there are broad shelves, made of elm, for putting the vessels that hold the milk and cream, and the newly-made cheese upon. On another side there is a frame with three large stone cheese-presses. In the middle of the north side is the door; and in the corner, on the left, is the stair leading up to the cheese-lofts; and behind the door is a single cheese-press, which is generally used in pressing the cheese the first time, before it is cut down and put through the mill. In the middle of the floor stand three leaden vessels, large enough to hold all the whey of one "meal" or milking; and by the side of these stands the cheese-tub.

Above the dairy there are two cheese-lofts, around the sides of which there are broad shelves for holding cheeses; and in the middle stands a frame for holding two rows of boards, called here "cheese-tack," which being only about eight inches apart, contain a much greater quantity of cheese than could be disposed on the floor. The stair to the cheese-lofts is of oak, and seems to be the pride of the dairymaid, for it is dry rubbed and polished so smooth that it is dangerous to walk upon; but this sort of pride is encouraged, as evincing an attention to cleanliness.

Along the north side of the dairy there is a shed, which communicates with the dwelling-house. In this shed the utensils are kept upon a stand for the purpose, the cream is churned, and other work performed, nothing being done in the dairy but the making of the cheese and the making up of the butter.

Opposite to the door of the dairy, and detached from the shed, is a wash-house with a pump-well at the door of it. In this wash-house the water and the milk are heated in boilers for the purpose, and all cleaning work is performed.

Utensils.—The milking pails are made of maple, on account of the lightness of the wood and its cleanliness of appearance. They hold about six gallons each, and the cheese tub is of a size large enough to hold the whole of the milk. The ladder, the skimming dish, and the bowl are of maple. The sieve for straining the milk is about fifteen inches in diameter, and has a hair-cloth bottom.

There are a number of cheese vats, sufficient to hold all the cheese made in four or five days. They are made of elm, and turned out of the solid. That which gives five cheeses to a cwt. is considered the best size for double Gloucester, the inside diameter of which is fifteen inches and a-half, and depth four and a-quarter; and that is considered the best for single Gloucester which gives eight to a cwt., the diameter within being fifteen inches and a-half, and depth two and a-half. Round boards, called "suity boards," made of elm, of the diameter of the cheese vats, and thicker in the middle than at the edges, are occasionally necessary to place on the cheeses when in the press, if the vats are not quite full. Without the assistance of these boards, the cheese will be round in the edges (a proof of not being well pressed), and not so handsome.

The cheese presses are made of stone, as being the cleanest material for the purpose, and of steadiest pressure. They weigh about seven cwt. each, they are raised by a block and tackle, and the whole apparatus is painted white.

From the whey leads, which are oblong, and about eight inches deep, there are leaden pipes which convey the whey into an under-ground cistern, near the pigs' houses, where by means of a pump it is raised when wanted for the pigs. Leaden keep the whey longer sweet than wooden vessels, and are much easier kept clean. This is done by scouring them with ashes of wood, and washing them well every time they are emptied, which is every thirty-six hours.

Tin vessels are used in preference to earthenware for holding the milk that is set for cream, and also for holding the cream. Those used for the cream hold about four gallons each, and are made with a lip for the convenience of shifting the cream from one of these vessels into another. This is done once every day during summer; and there is a wooden slice or knife always kept in the cream vessel, with which the cream is frequently stirred during the day, to prevent a skin from forming on the top of it, which is injurious to the quality of the butter. The skimming dish, used for taking the cream off the milk, differs from that used in cheese-making, being made of tin, with holes in it to let the milk run out that may be taken up with the cream.

The butter scales, prints, and butter boards are

of maple. The boards for making up the butter in half-pound rolls are about one foot long and nine inches wide. The barrel churn is made of the best oak, and great attention is paid to its cleanliness. The butter-milk is never allowed to remain in it, but it is washed, scalded, and put up to dry as soon as the butter is taken out.

Milking.—This is performed in three separate courts, to which the cows come from their several fields. The milkings should be as near as possible at equal divisions of the day, commencing at about four o'clock in the morning and three in the afternoon. To each milker eight cows are assigned, and one man carries the milk from all the milkers to the dairy. The milking should be finished in an hour. The dairymaid sees that the milkers do their duty, and that all the cows are milked clean; for the milk that comes last is the richest; and besides, if the cows are not clean milked, there will be a gradual diminution of the milk perceptible daily: for these reasons, the greatest care is taken that the cows are clean milked.

Cheese-making.—The cheese-tub being put in its place in the dairy, the ladder is put across it, and a large thin canvass cloth covers the whole tub and ladder to catch any of the milk that may drop from the pail, and to prevent dirt from falling into the tub. Above this and upon the ladder is placed the sieve, through which the milk is strained. If the milk should not be of the temperature of 85°, a portion of it is put into a deep tin, kept for the purpose, and placed in a furnace of hot water in the washhouse, by which means the whole is warmed to a proper degree. It is of the utmost moment to attend to this; for if the milk is not warm enough when the rennet is put into it, the cheese will be "tender," and will bulge out in the edge, which spoils its appearance, and a great quantity of sediment of small curd will be found in the whey leads, which is so much curd lost. If, on the other hand, the milk is too warm, it will cause the cheese to "heave" or ferment, which injures both its appearance and quality.

When the milk is sufficiently warm, the colouring and the rennet are put into it. The colouring or anatto is put in by rubbing a cake of it on a plate amongst the milk, until, from its appearance, it seems coloured enough. One pound of anatto, at five shillings, is sufficient for half a ton of cheese.

The rennet being added immediately after the anatto is put in, the tub is covered with a woollen cloth for, at least, an hour. Rennet or runnet is made from the stomachs of calves, called here, "vells." Irish vells are the best; they are cured, and sent to England, and sold by the grocers to the dairy-farmers. Mrs. Hayward never uses them till they are twelve months old; for, if they are not

old, the rennet made from them causes the cheese to "heave," and to become full of "eyes" or holes. She prepares the rennet from them by adding to every six vells two gallons of brine and two lemons. The lemons do away with any disagreeable smell, and give the rennet sweetness and agreeable flavour. Twenty or thirty gallons of it are made at a time, as it is found to be much better when made in large quantities. It should never be used till it has stood for at least two months.

When the curd is sufficiently firm for breaking, it is gently and slowly cut with a three-bladed knife, down to the bottom of the tub (the knife being about fourteen inches long), both ways or at right angles, and around the sides of the tub. The cuts should be about an inch apart. When it has stood five or ten minutes to allow it to sink a little, and the whey to come out as clear as possible, some of the whey is dipped out of it with a bowl, and the curd is cut a second time with the three-bladed knife—very slowly to begin with, for if the cutting is done hurriedly, a great sediment of very small curd will pass through the sieve, and be found in the whey-leads, and there will also be an increase of the quantity of whey butter which should have been in the cheese, and the value of the butter, thus obtained, will not compensate for the waste of curd, and for the loss of credit which the cheese will sustain from the abstraction of butter from it. The cutting being, therefore, performed very slowly at first, and with the strokes of the knife at a considerable distance from each other, is gradually quickened, and the strokes are taken nearer and nearer every time. At last, one hand with the skimming-dish keeps the whole in motion, turning up the lumps suspended in the whey, while the other, with the knife, is in constant motion, cutting them as small as possible; and this operation is continued till no more lumps are brought to the surface, and the whole mass is reduced to one degree of fineness. This process may occupy a quarter of an hour.

The curd is now allowed to stand a quarter of an hour, and being thus sufficiently settled, the whey is taken from it with the bowl, and poured through a very fine hair sieve, placed over the whey-leads. When the greatest part of the whey has been separated from it, the dairy-maid, folding over a portion of it, and beginning at one corner, goes around the tub, cutting the curd in lumps, and laying them on the principal mass, by which operation the mass is carried all round the tub, and most of the remaining whey escapes between the cut fragments, as they lie and press upon each other. From time to time the whey is taken from the tub, and put through the sieve into the whey-leads.

The curd is then put into vats, and pressed down

with the hand. The vats, being covered with cheese-cloths about one yard and a quarter long, of fine canvass, are placed in the press for half an hour, when they are taken out, and the curd cut into slices, and put into a mill fixed on the top of the tub, which *tears* it into very small crumbs, as small as vetches. This mill, which is of Mr. Hayward's construction, is a great improvement in the making of cheese, not only as it saves the dairy-maid the most laborious part of the process, that of squeezing and rubbing the curd into small crumbs with her hands, but as it allows the fat to remain in the cheese, which the hands squeeze out.

In its pulverised state, it is customary with most dairy-maids to scald the curd with hot whey, but Mrs. Hayward considers cheese richer when made without scalding the broken curd, this washing the fat out of it. She, therefore, without scalding it, puts it into the vats, and presses it closely together with the hand in filling them. In making double-Gloucester cheese, particular care is taken to press any remaining whey from the curd as the vats are being filled, and they are filled as compactly as can be done with the hand, being rounded up in the middle, but just so much so as that the whole can be pressed into the vat. Cheese-cloths are then spread over the vats, and a little hot water is thrown over the cheese-cloths, which tends to harden the outside of the cheese and prevent it from cracking. The curd is now turned out of the vats into the cloths, and the vats being dipped into the whey to wash away any crumbs of curd that may cling to them, the curd, inverted and with the cloth around it, is again put into them. The cloths are then folded over and tucked in; and the vats, as they are filled, are put into the press one upon another. The bottom of the vats are smooth and a little rounded, so as to answer the purpose of cheese-boards, which, therefore, are only wanted for the uppermost vats, or when the other vats are not quite full. The vats are allowed to remain under the press about two hours, when they are taken out and dry cloths are applied, which with double Gloucester cheeses should be repeated some time in the day.

Salting and Salting-presses.—The vats, when the clean cloths are given, as just mentioned, are changed from the single press to the one next to it, and placed in it, one upon another, as before. They remain in this press till the cheeses are salted, when those made in the evening take the place in the press of those made in the morning, and those made in the evening are, in their turn, displaced by those made the following morning; the cheeses of the last making being always placed lowest in the press, and those of the other makings rising in it according to the priority of making.

The same order is observed in the other two presses, the last or newest making in each being lowest, and each making having next above it that which was made last before it. The cheeses pass through the three presses in this order, advancing a step in their progress at each "meal" or making, till, at last, in four or five days they come out of the presses and are put upon the shelves. They are generally salted at the end of twenty-four hours after they are made, though this is done by some at the end of twelve hours. The salting should never be begun till the skin is all closed; for, if there be any crack in the cheese at the time of salting, it will never close afterwards. The salting is performed by rubbing with the hand both the sides and the edge of the cheese with finely-powdered salt. The cheese, after this, is returned to the vats, and put under the press, care being always taken, according to what has been said, to put the newest cheese lowest in the press, and the oldest uppermost. The salting is repeated three times with the single, and four times with the double Gloucester, twenty-four hours being allowed to intervene between each salting. After the second salting, the cheeses are returned to the vats without the cloths, that the marks of the cloth may be effaced, and the cheese may get a smoothness of surface, and keenness of edge, which is a peculiarity of Gloucestershire cheese. The double-Gloucester remain in the presses five days, and the single four; but in damp weather they should remain longer. The quantity of salt generally used is about three pounds and a-half to a cwt. of cheese.

The Cheese Room.—When the cheeses are taken from the salting-presses, they are put on the shelf in the dairy for a day or two, where they are turned once in twelve hours. They are then taken to the cheese-loft, to make room for the new ones. In the cheese-room, either on the floor or on the cheese-rack, they are turned once every day; and

in general, in a month from the time they were taken out of the vat, they are ready for cleaning, which is done by scraping them with a common knife. The dairy-maid, in doing this, sits down on the floor, takes a cheese in her lap, and with the knife scrapes both sides and edge clean, taking off all scurf they may have contracted. The cheese, if intended for the London market, as is generally the case when it has been thus cleaned, is rubbed all over with a paint made of Indian red, or of Spanish brown, or of a mixture of both and small beer. It is rubbed on with a woollen cloth. After being painted, it is turned over twice a week, and oftener in damp weather; and, as soon as the state of the paint will permit, the edges of the cheese and about an inch of each side is rubbed hard with a cloth at least once a week.

Characteristics of true Gloucester.—The marks of true Gloucester cheeses are "the blue coat," which arises through the paint on their sides, and which is a sure sign of their richness and sweetness; the yellow, golden hue of their edges; a smooth, close, and wax-like texture; a very mild and rich flavour; not crumbling when cut into thin slices, not parting when toasted, with the oily matter they contain, but softening without burning. If cheese has been soured in the making, either from being too long in hand or from want of attention in scalding the utensils, nothing will cause it to assume the blue coat. If the curd is salted when ground down, before being put into the vats, the salt has the effect of giving a skin to each of the particles of the curd it comes in contact with, which prevents them from intimately uniting; and, although the curd may be pressed together, and become good cheese, yet it never becomes a smooth, close, and solid mass like that which is salted after it is made, but is of a loose texture, and crumbles when cut; and although it may be equally fat, yet in toasting the fat melts out of it, and the cheesy part burns. The skin of the cheese, too, is not tough and solid, but hard and brittle, and, when examined, seems to be formed of many irregular portions, something like mosaic work.

PROPERTIES OF TURNIPS.

It was some time ago proved by the scientific agriculturists of France that the properties of beet-root are hereditary; or, that roots excelling in sugar will, if planted for seed, yield seed that will in its turn produce roots excelling in sugar to an equal if not a greater extent. The amount of saccharine matter in two or more roots of the sugar beet is ascertained by finding the relative specific gravity of each—the densest roots always containing the most sugar; and it is an interesting fact, that by careful selection of the roots to be planted for seed, aided by the power of hereditary transmission which the plants possess, the French beet-root growers have doubled the amount of sugar contained in a given bulk of roots, and that the produce of sugar from beet is thus increased one

hundred per cent., the size and number of the roots remaining the same. Thus it is that the labours of cultivation bring their own reward, and have done so ever since the first man began to till the ground. In the *Courier* for Feb. 2, we made some remarks on the properties of turnips and beet-root, as indicated by their specific gravity, ending with some queries indicating points that were doubtful. Light has been thrown on some of these by the experiments conducted at Yester by the Marquis of Tweeddale, and with the advice of Charles Lawson, Esq., of Borthwick Hall, who has for some years kept himself fully acquainted with the progress of the continental experiments. The perusal of an address given by the Marquis, at a recent meeting of the East Lothian Agricultural

Society, leads us to return to the subject. The Marquis, it may be mentioned, brought forward for discussion the following question:—"Whether a more correct principle than specific gravity can be discovered in selecting turnip roots as an origin of seed for improving the stock;" it having been proposed to award a premium of £20 for the best essay on the subject. In the prize list of the society, the following note is appended at the end of the list of premiums for a competition of bulbous roots, meaning by that term, turnips, carrots, potatoes, mangold-wurzel, &c., "weight to be the principal criterion, provided the judges are satisfied of the quality, shape, and purity of the roots exhibited." The Yester and Borthwick Hall principle is not weight merely, but weight or density in relation to comparative bulk. In beet-root experiments it is found that the smaller roots are more dense and more sugary than the larger; and hence, the sugar manufacturers in France offer a lower price for all that exceed in weight five pounds. It is the same with turnips, the large specimens, forced in their growth, perhaps, by manure or by heat and moisture, being lighter in proportion to their bulk, because being more fibrous and spongy in the heart, and containing more air. It is true that oil, one of the valuable fattening ingredients in turnips, tends to make the dense kinds light in proportion to its quantity; but the per-centage of this is so small that it does not affect the general principle. Oil is excluded from the list of those ingredients that are at once fattening in their tendency, and weightier than common water. At the meeting it was stated by the Marquis that he and Mr. Lawson had proceeded in their researches on the principle that the density of a turnip is an index of its value as food for cattle; and that by selecting roots of the greatest specific gravity for seed, their hereditary quality of density is transmitted nearly in the same ratio. To illustrate the correctness of this principle, he divided the constituent parts of a turnip into those heavier and those lighter than water—the first being woody fibre, albuminous compounds, sugar, gum and other allied principles, phosphates and other salts; and the second consisting of oil and air. He considers that in those turnips which are lighter than water the low density must mainly be attributed to the amount of air present, which renders the whole so buoyant as to float in water. The amount of air is so great in most turnips, except swedes, as to render them even of less specific gravity than pure vegetable oil; consequently, it is held that air alone causes turnips to be deficient in density, at least so long as their specific gravity is below .950, that being the average density of vegetable oils. As swedes exceed this density, their specific gravity is of course lessened by the oil they contain; but this can only be to a very small extent. Great lightness in a root is therefore taken as implying that it contains much air, and correspondingly little nutritious matter; and after setting down a very small per-centage of the lightness to the oil, which is a useful ingredient, the conclusion was arrived at by the experimenters that, taking bulk for bulk, there is a greater weight of nutritious matter in the heavier of two turnips, both of which are

lighter than water. To Swedish turnips, which generally are heavier than water, a similar conclusion is extended; their specific gravity, doubtless, appearing smaller than that which the solid matters of which they are composed would show if all air were separated from them; for, although experimenters have not ascertained precisely the feeding or fattening properties of each of the constituents, yet, they have learned from the density the amount of solid nutritious matter excluding oil, which equal bulks of turnips contain; and, as the Marquis remarked, if we deduct the influence of the air contained in them in diminishing their specific gravity, then we may, without hesitation, conclude that the heavier that a turnip is (in proportion to its bulk), the larger will be the amount of nutritious matter contained in it. In regard to turnips as they are, the smaller roots are proportionably more nutritious than the larger; and the object of these experiments is to provide that the good properties of both small and large turnips may be increased, or that the density of large turnips may be rendered perhaps as great as that of small turnips was formerly. It is held that in regard to seed produced from roots of a given density, there is good evidence to show that the qualities of the parent will be transmitted to its offspring, and exert an influence on succeeding generations; and it is therefore true that when, as is now the case, seed turnips are planted indiscriminately, or with attention paid only to the shape and colour of the roots, inferior as well as superior qualities will be thus transmitted. Those farmers who grow their own seed might find it highly profitable to ascertain the gravity of the roots before planting them out, rejecting those which are under a certain standard, which may be fixed at the average of a number of roots of the same kind—say, for white turnips 41 grains for a piece of the root extracted by a cylindrical borer, the piece being an inch long and half an inch in diameter; 45 grains for yellow turnips, and 50 grains for swedes. Various other modes, more or less simple, may be employed. It may be some time before it can become customary for seedsmen to sell turnip seed warranted to produce turnips of a certain density; but if farmers were alive to the importance of the matter, a beginning would soon be made. The Marquis said, in the course of his address, "I have sent the seed, grown on the principle described, to Mr. Lawson, who has distributed it in portions to be sown on various soils in different parts of Great Britain, where he can depend on proper attention being paid to the seed not being adulterated by a mixture of other seed grown in the neighbourhood. The ticket I send with the seed to Mr. Lawson guarantees that it is sprung from turnips of the species enumerated, selected with the greatest care and nicety, and above an average of many thousand turnips, the specific gravity of which have been tested by weighing small pieces, selected from three different parts of a turnip, in scales and water, and which has afterwards been planted for seed." It appears from all this that the art of raising turnip seed has only now commenced to merit the name of an art; and that it may be that the experiments at Yester are destined to exert an influence on the turnip husbandry of future times.—Perth Courier.

LONDON CENTRAL FARMERS' CLUB.

The usual monthly meeting of this Club was held on Monday, May 1st, at the Rooms, New Bridge-street, Blackfriars; Mr. J. Pain, of Felmersham, Bedford, in the chair. The subject for the evening's discussion was, "The Diseases and Blights affecting Plants, and the best means for their Cure or Prevention." Proposed by Mr. R. Baker, of Writtle, Essex.

The CHAIRMAN said he felt happy in introducing Mr. Baker to the meeting. He was a gentleman universally respected, and he might almost be considered the father of the club (Hear, hear). The subject he was about to bring forward was one of great importance, and the meeting might be sure that it would be profitably and satisfactorily handled.

Mr. BAKER then read the following paper:—

ON THE DISEASES AND BLIGHTS AFFECTING PLANTS AND VEGETABLES.

The subject put down for this evening's discussion is not only interesting in a scientific point of view, but to us, as agriculturists, it becomes more especially so, as it embraces a subject upon which we are all deeply interested, and by the investigation of which I trust that a new field will be opened for observation, and in the end teach us how we can best mitigate the disastrous effects of those diseases, usually denominated *blights*, of the plants and vegetables that come under cultivation in this kingdom; and I shall, therefore, divest my subject of scientific and technical terms as far as I am able, and reduce it to the language current amongst our class, and for the most part best understood. Plants live and grow, and, for aught we know, feel; and, like animals, when supplied with food congenial to their support, and in sufficient quantity, under suitable conditions of atmosphere, temperature, light, moisture, and soil, flourish and arrive at maturity. But if a superabundance or deficiency exists in any of these particulars, or any other disturbing influence arises, the health of the plant becomes affected, and it dwindles away, and finally dies without fulfilling the end for which it was designed—of perfecting its seed for the continuance of its species. Independent of plants becoming diseased under the circumstances mentioned, they are liable to attacks externally by insects or parasites, or plants of the fungi tribe becoming attached to their stems, leaves, or roots, and, by absorbing their juices, destroying or so far injuring them as to deteriorate their value in part or altogether. These constitute what are usually denominated blights, and are most difficult to counteract; but, as they arise frequently from causes which operate in a certain manner and are known, and which have to a certain extent been controlled, we are therefore led to suppose that in process of time, under diligent observation and investigation, all diseases of like nature may be counteracted or mitigated. And if we can show in any instance that we can by cultivation effect this object, or that we can by the external application of other substances prevent

its recurrence, we have every encouragement to proceed; and I hope to be able to show that this has been successfully accomplished, and, therefore, to infer that our further endeavours may be crowned with like success. I shall, therefore, proceed at once to an elucidation of this portion of my subject; and shall, in the first place, treat of diseases denominated blights, most of which arise from hidden causes, and are the effect of parasitic fungi, to which nearly every plant is subject to one or more peculiar to itself. Sometimes these fungi are the cause, and sometimes the effect, of diseases in the plant; and it must have been obvious to every one, that when portions of plants, as the branches of trees for example, become diseased, they are immediately attacked by parasites, either as lichens or some species of fungi, one of which is especially known to us, of large dimensions, affecting the ash, and generally found protruding from some decaying portion of the stem or branches, and sought by school-boys for making playing-balls, called *sap-balls*. Fungi of every class affect decaying wood, especially that description attendant upon the decay of timber converted to building purposes, denominated *dry-rot*, for which the famous kyan was invented and applied as a remedy, and for which, if properly applied, is a certain preventive. How fungi are originally produced we are unable to tell, but we know under certain conditions of atmosphere and moisture that they are invariably produced; and we are, therefore, induced to suppose that they may be of spontaneous production. This of course, if asserted, would be denied; but it is also sufficiently apparent to be believed, and I cannot say *why* it should be so strongly insisted upon, seeing that there is no proof to the contrary. Galileo asserted that the earth revolved round the sun, and became a martyr to his opinion; and, although compelled to recant before the Inquisition, he still reiterated it on his way to execution, by stating, "The earth does move, notwithstanding." The production of fungi is mysterious; and, although many descriptions of them attack plants externally, and are spread over the surface of the stalks and leaves, as the Puccini graminum or mildew affecting the wheat plant, and other varieties affecting the Swedish turnip, cabbage, or pea, there are others that are communicated by the sap vessels, and the spores or seeds of which are taken up by the plant during its growth from infected seed of the previous season, and even the soil itself, such as the *Uredo foetida*, or smut-ball or bladder in wheat, which is developed in the succeeding year by displacing the grain and filling its place with a foetid black substance, which, when dry, becomes a minute black powder, attaching itself to healthy grains, is by them reproduced in the following year, unless its vegetative property is destroyed by the application of some mineral or alkaline substance sufficiently powerful to destroy its vegetative powers without injuring the grain to which it has become attached. This is best

effected by a solution of blue vitriol dissolved in boiling water, in which the wheat is immersed and skimmed, whereby the object is fully and certainly attained. Another description of fungi, called pepper brand, is invariably produced by growing the same description of wheat for many seasons in succession upon the same soil, and which is remedied by a proper change of seed. The mildew in wheat, *Puccinia graminum*, is a scourge that every farmer, more or less, has experienced; and, although some districts are almost free from its attack, others are peculiarly liable. Portions of particular fields are also more liable to be attacked than other portions; and particular plants have a tendency to produce it in neighbouring localities, or of stimulating it into action. Of this I shall mention one particular instance, invariably contradicted by men of science, but found to prevail by men of practice, in wheat, wherever the barberry shrub or plant is found in the plantations and hedges surrounding wheat fields, I can bring so many proofs of this being the case that I shall consider it waste of time to prove them. Portions of certain fields, however, were for many years infected with mildew in the vicinity of such plants, and it was invariably found of greater intensity nearest the plants. A license was at length given to the tenant to remove them, and the field was no longer subject to mildew; but several years after, it was discovered that at one portion of one of the fields that had been so treated mildew again prevailed, and, upon examination, the barberry plant was found again to have established itself by some of the roots that had been previously left in the soil. They were again removed, and mildew never again appeared. Within my own knowledge, as many as three remarkable instances of like nature have occurred where fields invariably had been mildewed as long as the barberry plants remained, but which ceased altogether to be so upon their being removed. Some very talented and scientific men have ventured to deny this, by stating that the fungus, or mildew, by which the barberry is infected is totally different from that by which the wheat is attacked, and, therefore, that such a result could not possibly follow. But still it may be possible that the barberry may induce the production of mildew in wheat without being infected itself; and I have seen instances of the wheat being infected as before stated, and traces of mildew could be also found upon the barberry; besides, the production of all parasites appear to be governed by laws peculiar to their class. I have also known instances, and one especially, of late recurrence, of timber, especially elm, being sawn into boards, and the whole surface of the boards having within forty-eight hours become covered with the mycelium of a fungus. When this had been carefully removed, it again and again took place two or three times over, nor would anything prevent it except removing the boards into a spot where a free circulation of air could be obtained. So of dry rot, if timber is thoroughly painted, especially oak, it becomes infected and destroyed internally; but if such timber is submitted first to a strong solution of corrosive sublimate in water, it never afterwards becomes affected in like manner. So in the floors of dwelling-houses, if painted

floor-cloth is kept down close both the floor-skirtings and timbers become affected, and the whole mass of wood-work will, in a short time, be intersected with minute filamentous fibre or mycelium; and the fungus will be found protruding from the decaying portions, and, if not arrested by a free admission of atmospheric air, proceeds to the destruction of the fabric of the building itself. Corrosive sublimate in solution appears to have the property of counteracting the effects of mildew in canvas and cordage; and if waggon and stack cloths, sacks, &c. be submitted to a solution of about one drachm to a quart of boiling water, their durability will be greatly increased; this may be easily tested by two pieces of pack-thread of similar quality being strained side by side in the open air; in one instance, an experiment was made but not completed; although that piece submitted to the solution remained upwards of three years perfect, and was then removed by accident, the piece not prepared rotted within one year and fell to the ground. For some purposes, the kyan (or corrosive sublimate) may be used with advantage and profit. For the naves of agricultural wheels elm is used: as this wood is very susceptible of decay, the exposure of the wheels causes them to rot in a very few years, and long before the spokes made of oak show any symptoms of decay. But if the elm naves when new were subjected to a strong solution of corrosive sublimate and boiling water, and allowed to become fully saturated, they would become as durable as oak itself; but it will be necessary to first put on the hoops and cut the mortises for the spokes, or they will by the application be rendered so hard as to enable them to resist the edge of the finest steel chisel. I will now return to the subject of parasites infecting our crops and fruit trees: these consist of two kinds—one which attacks plants internally and exhibit themselves to our view after they have protruded, or burst through the surface of the stems of plants, for the purpose of shedding their spores, and thereby continuing their species; the other, that are found superficially upon the leaves and stems, as well as upon the fruit of the vine, and upon the leaves of the cabbage, swede, and common turnip, pea, &c. The first description appear to select plants in a highly vigorous state for attack; the latter description those that have become debilitated, especially by drought, at the period of the year when the quantity of light decreases, and the alterations from heat to cold are more sudden and repeated, especially in the early autumn, when the hot sun during the day is succeeded by cold and heavy dews at night. Of the first description is the *Uredo foetida*, pepper-brand or smut-ball in wheat: this fungus is well known, and consists of partially-formed grains of wheat, containing a black foetid paste-like substance, which when fully ripe is converted into a black powder, consisting of the spores or seeds: each particle, upon thrashing the crop, becomes disseminated amongst the sound grains, to the ends of which they become attached, and during the process of vegetation are taken up by the sap vessels of the plants, and re-produced in the succeeding year, unless arrested by submitting the wheat to a thorough washing in lime water, or to a strong solution of some mineral substance or alkali, sufficiently

powerful to destroy their vegetative power without injuring the wheat itself. Nor is the infection produced alone by the wheat used as seed: every particle of the straw and chaff infected with this fungus has the power of reproducing it; and in one instance, within my knowledge, where the dust from a dressing machine used for cleaning infected wheat was distributed over a portion of a field sown with wheat, the effects could be traced, shading off in intensity as the distance from the barn-doors increased. The mildew, as it is termed, in wheat (*Puccinia graminum*), is generated beneath the epidermis or outer skin of the stems of the wheat plants, and protrudes when ripe (soon after the kernel of the wheat has formed) in dark blotches of a dull dark-grey colour, which changes to a dark-brown or black upon becoming further exposed to the air, and, upon examination with a microscope, myriads of minute fungi are found existing upon a small space, with their spores protruding externally. By their presence the filamentous portion of the straw is broken up, and the sap at the same time is absorbed by the fungi; the straw becomes black and brittle, and the grain shrivelled; and frequently, after the agriculturist may have with exultation congratulated himself upon being about to reap an abundant crop, his hopes become suddenly destroyed by witnessing a black and blasted field, not worth the cost of harvesting. As no other pest with which I am acquainted is attended with such disastrous consequences to the farmer, I would fain endeavour to point out some remedy or palliative; but as none is at present known, I must content myself by directing attention to such modes of cultivation as may tend to mitigate, and to a certain extent prevent its ravages; and having for nearly forty years watched its progress and recorded results, I may probably be able to advance some facts that may be worth your consideration, and which may become a stepping-stone to further investigation. It is quite certain that mildew was more prevalent at the commencement of the present century than at the present time. Two most important improvements in farm management within that period have taken place—the first, a system of effectual and general drainage; the second, the clearing away of wide hedge-rows and borders of arable fields, the removal of timber, the application of inorganic substances as manures, especially chalk, lime, marl, &c., and the introduction of vegetable crops in each rotation. To some one or all of these we may be able to attribute the cause of its having become less frequent; and in corroboration of this opinion, it was notorious that all such fields that had a porous subsoil charged with water, in farming phrase called *woodcock soils*, were especially liable to mildew, and if hemmed in by timber and wide hedge-rows, which prevent a free circulation of air, the tendency to mildew was increased. The drainage of a porous subsoil would tend to its consolidation, and the application of chalk and lime, or marl, would produce a chemical action; whilst an application of them would not only consolidate light porous soils, but also render heavy and tenacious soils more open and free to the admission of air; whilst the introduction of vegetable, clover, and legume crops, in place of naked fallows, would have a tendency to take up the ammoniacal portions of the manure, and to leave

the carbon and other portions most beneficial to grain crops, for their support in the next rotation. Everyone who has become practically acquainted with farming; knows, that if fresh farm-yard manure is applied liberally for a crop of wheat, great exuberance and a dark-green colour of the leaves of the plant follows, and that rust or mildew will probably ensue; but on the other hand, if wheat succeeds clover, or beans, or peas, mangel wurzel, or any description of grain crop, to which manure has been previously liberally supplied, that in such cases mildew rarely attacks, unless in moist seasons attended with close sultry weather in July, or when sudden transitions of temperature rapidly succeed each other. In such seasons in certain districts nearly every field is sometimes more or less affected; predisposing causes operate to such an extent as to baffle any attempt to counteract them, nor are we aware that they exist until it becomes apparent by the destruction of the crop. All we can do is to direct our farm operations to secure the object in view by well directed management. As a principle it is better never to manure directly for the wheat crop, but to apply manure liberally to the crop in previous rotation, and preparatory for it. Upon clover, either if mown or fed, manure may be liberally applied in the preceding autumn, or in July directly after the hay crop has been removed: the manure in that case should be reduced by composting with common soil, or by applying it for beans and peas in the preceding spring, when it may be liberally bestowed; whilst after a vegetable crop has been taken, especially if of potatoes or mangel wurzel, little fear need be entertained of its presence in too great abundance. If the land has been well drained, and contains a sufficiency of carbonate of lime, and the cultivation has been regular and well carried out for several years preceding, little apprehension need exist of any frequency of the recurrence of this scourge; and although I would not be so bold as to assert that human skill or foresight can protect us at all times, I am, notwithstanding, prepared to show in any season when its prevalence is general, that its intensity in different fields, and especially in parts of fields, may be traced to the system of cultivation that had been previously pursued—in some cases to the drainage alone, and in others to the course of cropping that had taken place. On some soils wheat is greatly addicted to mildew if sown succeeding *tares* or *peas*, but rarely if succeeding beans, or clover fed off with sheep during the preceding summer; and the firmer the seed-bed for it is rendered, the less liable will it be to become mildewed. Hence the practice of consolidating the soil as much as possible for its culture, and above all by after management keeping the soil free from weeds; for wherever they abound they necessarily prevent the free circulation of air and admission of light, both essential to the healthy development of the plant, and in its early stages, if found more than usually exuberant of growth, it should be eaten down by sheep, provided that by so doing the crop is not materially retarded at harvest; for it is invariably found that *late* crops are most liable to its attacks, and if at the same time the plant is thin upon the ground they become doubly so, and we may assert fearlessly that if plants of wheat accidentally produced

upon dunghills, or near thereto, are examined, in nine cases in every ten they will be found infected by this fungus. And there is also little doubt that by combining judiciously with our soils inorganic substances, especially carbonate of lime, and by pursuing a regular and clean course of cultivation, with good drainage, and clearing away trees and fences, so as to admit light and air freely, but little hazard will arise from attacks of mildew. The atmosphere doubtless has great tendency to facilitate its production, but still with the precautions mentioned it may be mitigated when it cannot be subdued. The fungi tribe are so numerous that it would be difficult to advert to many of them upon an occasion like the present, when it is necessary to compress our observations to the space allotted; but as the wheat plant is of all others the most important to man, I shall mention those to which that plant is most liable: and having already discussed the one which attacks the stems of the wheat plant, I will now proceed to describe others that attack the leaves and grain, which although not so injurious in their effects, still are sometimes productive of extensive and serious injury; amongst the most prominent of which are the Uredines, which are generally found in the form of dust upon the leaves of the plants, of a dingy red or dirty yellow colour, similar to brick-dust, and which is readily detached from the plant by the shoes of persons passing through the field affected with it. The one called *Uredo rubigo*, or *red rust*, conveys by its name a faithful description of this pest; and it is in some seasons very rare indeed to find a field of wheat entirely free from it: but when it is prevalent to more than a usual extent, it not only attacks the leaves, to which it gives a ragged appearance, by breaking up the cellular tissue of the epidermis, or outer skin, covering them with a coating of rusty red-coloured powder, but it attacks the chaff also, extending from the inner to the outer surface of the glumes, of a gum-like appearance; and when it arrives at that state is denominated *red gum*, in accordance with its usual appearance of red rust, when its attacks are confined to the leaves only. In weather that is showery and moist, and attended with sudden atmospheric changes of temperature, it is most prevalent; but a few days of genial sunshine frequently dissipates it altogether. The prevailing cause is doubtless sudden transitions of temperature under imperfect circulation of air; for, upon examination with a microscope of high power, the mycelium and spores will be found spreading themselves over the whole surface of the leaves, and that which appears to us as rust are the spores, or what corresponds to seeds of vegetables, which become detached by the air or any sudden contact. In the year 1846 it was extremely prevalent, and the fields appeared to suffer as if by scorching of the leaves; and whenever it extends so considerably, the crops must as a consequence doubtless be greatly injured, as the functions of their leaves are most important for the healthy development of the plants, every leaf having a large number of pores, by which it imbibes moisture or gives off what is obnoxious, acting as the lungs of animals, and are to a certain extent analogous to the pores of the human skin, the slightest derangement of which affects the health of the individual:

so, whenever the pores of the leaf are obstructed, an unhealthy condition of the plant follows, not sufficient to destroy its perfecting its grains, but just sufficient to prevent those grains becoming of that plump and regular form and character so highly estimated and prized for converting into flour. It has been observed of those fields in which the crops are most exuberant, and the colour of the leaves are darkest, and to appearance most luxuriant, that their disposition to become affected is more certain than where the reverse is the case; still no mode of cultivation can be prescribed beyond that which was mentioned in the previous instance of mildew—the black or burnt ears of wheat whereby the ear appears covered over externally with a black sooty substance, and its destruction complete; and although this is undoubtedly a fungus, and its effects on future crops are prevented to a great extent by its becoming washed off before harvest should sudden rains take place, it may undoubtedly be prevented by carefully steeping the wheat as before described; but it is found also prevalent in our barley and oat crops, from whence it might also be eradicated if a similar process was adopted, by steeping the seed as in the case of wheat, and to which I shall direct your attention, as this *Uredo segetum*, called by farmers burnt-ear, dust, brand, blacks, &c., is doubtless produced by sporules of the preceding year absorbed by the plant during its growth, either from infected seed or straw when converted into manure. Another fungus, perhaps not more destructive than the latter, but far more injurious from its imparting to the flour of wheat a dark hue, attended with a stinking and foetid odour, which may be readily ascertained by pressing it between the fingers. It is found filling the spaces between the chaff allotted by nature for the grains, and appears like an imperfect grain until the skin is broken, when it will be found to consist of a black pasty substance, that sticks readily to the fingers, and imparts a disgusting stinking odour to them, and if allowed to stand until the grain is fully ripe, this substance is converted into a black powder, breaking readily under the process of thrashing, and becomes attached to the ends of the sound grains, and is again re-produced in the following year by the sporules being taken up by the sap-vessels, and carried on through the circulation. This fungus is called *uredo-fetida*, bunt, smut-ball, bladder, or bagg: it is so common as hardly to require a description; and the prevention of its recurrence, by steeping the seed-wheat in various solutions and preparations, especially of blue vitriol, so as to destroy the vitality of the sporules, the process of which is also so well known as hardly to require a description. If a portion of this black substance is examined under the microscope, it will be found to consist of innumerable sporules, connected by mycelium; and according to M. Bauer, one grain alone will contain upwards of four millions of spores; every one of these has, from its oily or greasy nature, a liability to become attached to the sound grains, for which they have affinity, and from which they can be detached, by washing the wheat intended for seed in alkaline solutions, as before described. The wheat ears in some seasons are so far affected that a portion of

them change to a white colour a short time before harvest, becoming what are termed blighted ears; but this defect arises from some imperfection at the roots, either by insects eating them through beneath the surface, or through the knots of the straw; and frequently the support hitherto derived by the plant is insufficient to carry it through, until the grains are formed, and it dies before that purpose is accomplished. Sometimes the flowering of the wheat is inefficient, from a continuance of rain and cold at that period when it takes place, especially as was the case in the past year, 1853, whereby the produce of this kingdom was diminished nearly 40 per cent. To insure the fructification of the plant, dry and warm weather is most important, with a full average of sunshine, from the time of its coming into ear until harvest; for unless this is the case the glumes of the chaff do not sufficiently contract to cause them to open sufficiently to allow the anthers to escape, whereby the pollen may be distributed, and the impregnation completed; and to those who have microscopes I recommend an investigation of the pistil of the wheat plant at this period as one of the most beautiful objects that can be brought under observation. The fine wax-like filaments will be found clasping the pollen in a curious and singular manner, similar to that of the barberry, securing its pollen immediately upon its coming into contact with the fine filaments of the pistil. If, after two or three cloudy days in succession, the sun suddenly bursts forth, the chaff of the wheat of the several glumes will be seen opening in rapid succession, and the anthers will be projected with a jerk, and the pollen falling upon the pistil, the chaff almost immediately closes, and the impregnation is completed; and for a full and certain development a succession of dry and warm weather, with sunshine, is necessary; moist, and especially rainy seasons are uncongential to the production of a full crop of wheat, and the greater the heat of the succeeding interval until harvest, so in proportion will be the quantity of the grain produced, and gluten will be formed more abundantly, whilst the grain will obtain considerably in weight. In case of mildew attacking a crop of wheat, the sooner and more expeditious it is reaped the better, for it has been found that a reaction of the circulation by the sap-vessels takes place after mildew is once established, and the grains become abstracted of the sustenance they previously imbibed, if allowed to remain uncut for any length of time after the mildew has developed itself. It is a fatal error at all times to suffer wheat to become fully ripe before cutting; even under propitious circumstances, and in case of its becoming affected by any disease that checks its progress, especially as described with mildew, it becomes more necessary to speedily sever it at once from the soil. Several experiments have been made upon wheat cut a few days before the grains became hard, just at that period when the straw had changed to a bright yellow colour a few inches below the ear. In every instance the sample was superior to that which was allowed to stand until fully ripe, or a few days later; and the quantity was also as great, whilst the quality of the straw was also very superior. In the observations I am now about to make, I beg to be understood that I take

the subject, as it stands upon the card, to refer to diseases of vegetables, usually denominated *blights*; but as such diseases are frequently caused by insects, I shall refer to some of them that I consider may be of interest to the class to which I am attached, and many of the prominent members of which I have now the honour of addressing. One of the greatest pests of the farmer is the wheat-midge, *cecidomyia tritici*, a small yellow-ocherous coloured insect (smaller than a gnat, which it somewhat resembles), and which frequently in June may be discovered in large numbers upon the ears of wheat at the time of their first bursting forth, and will be seen resting upon that side of the ear which first protrudes itself from the sheath in which it was recently enveloped; they will be found quietly placed with their tail-like ovipositors inserted between the chaff, for the purpose of depositing their eggs, and are most active from five o'clock to seven or eight o'clock in the evening; especially if warm and the wind still, and when the season is suitable for them, five or six may at one time be sometimes seen upon a single ear. The eggs thus deposited are secured by some substance that causes the glumes of the chaff to adhere together, thus preventing the anthers escaping, and the fructification of the wheat taking place. Upon examination shortly afterwards, several small orange-coloured maggots will be discovered, which feed upon the pollen, and exude a red-coloured powder; they move by a particular jerk or jump, when exposed, very similar to that of the maggots bred in cheese. The wheat-ears affected soon give outward indications of the mischief that has taken place, by the discoloration that follows; and it frequently happens that one side of the ear is entirely deficient of grains, or, as is sometimes the case, of grains partially or imperfectly formed. This injury to the crop in some districts is called the maggot and red gum—the latter name, however, has no reference to it, but to that previously described as the *rust*, and which shows the necessity of these subjects being more generally investigated, and consequently better understood by agriculturists, as it is absolutely necessary that proper distinctions or terms should be applied before any great advancement can take place. About the time of harvest the maggot changes to another form of larva, of a paler colour and thicker skin, very much resembling a chrysalis, and may be found sometimes in myriads upon the thrashing-floor; but they most commonly fall from the ears to the ground before the wheat is carried. No remedy is at present known, nor has any attempt been hitherto made, with which I am acquainted, to prevent its ravages; nor can we suppose any one will be likely to effect that object, unless fumigating the growing crop from the windward side by the smoke of burning substances obnoxious to them will effect it: but as their appearance is retarded more or less, in some seasons, their attack is confined to the earliest or latest pieces of wheat, as it may happen. A certain description of fly, of the ichneumon class, seeks them out with great avidity, and, wherever it can find access to them, destroys them in a manner peculiar to itself. It is very probable that they may continue to exist in the

earth, either in their last described state or as a chrysalis, and may come into action on the first occasion of wheat being again grown on the same field. Insects, we know, have the power of prolonging their existence in the larva state, especially that of the wireworm, as long as food can be found to supply their wants; and, on the other hand, they may probably remain inactive in their larva or chrysalis state until food is ready for them. We know of instances that bear out this supposition; especially that of the turnip fly, which invariably appears at the time the food is produced upon which it feeds. I shall not pursue this digression further, but return to the subject which we are met to discuss, and shall now advert to the blight or disease that has for several years been attendant upon the potato, and has, in its effects, been sufficient to alter the destiny of a kingdom. We at present know little of the origin or production of minute fungi; but, as far as investigation has proceeded, we find that the minute fibre called "mycelium" corresponds with the office of plants, and the fungus the development, the spores of which contain the sporules, which are analogous to the seeds of vegetables as regards reproduction, and which are so minute as to baffle investigation by assistance even of the most powerful magnifiers. These sporules are disseminated throughout the atmosphere, and remain inert, or in a state of inaction, until the period arrives until certain conditions of the atmosphere, soil, and other circumstances conspire to their development. That which we denominate mould comes under this denomination, and every vegetable substance is more or less subject to this *oidium*. It is to be found upon almost every substance whilst entering into a state of decomposition, which it greatly facilitates; and may be seen in great perfection upon sour paste or bread, in summer, and, under different forms, upon many vegetables in their growing state. The leaf and stem of the pea, the tare, and other vegetables, are all liable to its attack in some form or other, and upon whose juices these parasites subsist. One of them is in some seasons very prevalent upon our tares, and suddenly destroys them, presenting no other appearance than that of a white mould upon the leaves and stems. Another attacks the pea, especially those sown late, and completely destroys vegetation. Another attacks the vine, and not only destroys the crop, but injures the plant to such an extent as either to kill or render it barren for several succeeding years. The winter-beans of 1852 were universally killed by it; and the ravages it has effected upon the vines, both in this country and in the vineyards of other countries, have rendered it doubtful whether wine will be produced for some years in sufficient quantity to meet the demand. The *Botrytis infestans* is found prevalent also upon the potato; and, if not the cause of the disease which for several years has destroyed that useful esculent, is, to say the least, a consequence or effect, and is always attendant on it; and probably, as I suggested when I last had the opportunity of addressing you, some preparation may be found to destroy or prevent its attacks. Sulphur, applied to the vine and peach-trees, entirely subdues it; and although we can scarcely hope for success upon a large scale, we may

succeed, to a certain extent, in our forcing-houses and gardens. The onions are frequently destroyed by the *Botrytis* called "destructor;" but that which attacks the potato—the *Botrytis infestans*—more especially deserves our attention: but such are the hidden causes of infection and contagion, as regards the production of fungi, that we must wait with patience their further investigation. In most cases of the disease of the potato, the parasite is found to exist. It is very true, notwithstanding, that in some instances it has not been discoverable; but whenever it is present, it appears to introduce its mycelium, by minute threads, throughout the whole of the stems and leaves of the plant; and their presence in the form of mycelium in the previous potato plants has been fully demonstrated to have been discoverable; and so readily has it been found transferable, that in one instance, where it had been discovered existing upon sikk, it was found that potato-starch had been used in the manufacture, and by which, doubtless, the sporules of the fungus had been transferred. I have for several years made a close examination of the *oidium* affecting the vine; and I have found that the *spores* retain their vitality for a great length of time together. Upon removing them from the vine-leaves, they were placed upon the concave sides of watch-glasses, and dispersed irregularly over the surface. These glasses were placed in the drawer of the microscope, and, upon examination some time afterwards, every one had thrown out a hair-like substance similar to mycelium, each proceeding in a *direct* line from one sporule to the other, although at a distance of a thousand diameters, and, when carefully inspected, represented a well-executed map, the spores representing the places of towns and villages, and the mycelium the direction of the roads. It is probably from this affinity that the sporules have for each other that mycelium is reproduced, and that it is itself the vegetable process of an aggregate number of sporules, forming a connected mass of mycelium. That which we denominate spawn, and by which mushrooms are produced, is the mycelium of that fungus, and the mushroom the development, containing millions of sporules for its future production. As all the fungi tribe are influenced by the same laws, the larger class, more easily coming under observation, exemplify those that are minute in form; and therefore the study of the one introduces us to the knowledge and character of the other. With animals, we find that poverty, filth, and disease produce parasitic lice; so exhausted soils, bad cultivation, and weeds induce parasitic fungi. Nature, therefore, points to the mode of prevention; and although we may not be able entirely to effect it, we may by assiduity and good management, lessen the chances of *ill*, and reduce our practice to a certainty of successful result unknown to those who neither reflect nor take precaution. The diseases, if such they may be termed, that attack clover, turnips, and other plants, sown too frequently upon arable land, deserve our utmost consideration, as the loss of these valuable productions to the agriculturists are incalculable; and as the hazard appears to increase as we proceed, the time may arrive when their production upon some descriptions of soils may become the exception, and not the rule. It has

been found more especially, of late, that if clover is sown under every rotation of four or five years' cropping, after a full plant has become established in the autumn, it entirely disappears in the succeeding spring. The leaves first wither and then die; and the root, upon examination, will be found passing rapidly into decomposition, and frequently will be found covered with fungi, and the living larvæ of insects; it will be found also, upon examination, that the roots begin to die at various parts and portions of the field at the same time, and that they continue day by day to disappear as they extend from the centre, in concentric rings, from each of those points spreading wider and wider as they proceed, like the waves formed upon the surface of water by throwing in a stone; and sometimes with the exception of the headland only, or upon portions of the field that have recently been renovated by application of virgin soil, or of other substances that are congenial to the production of the plant, especially carbonate of lime or gypsum; all of which goes far to establish the fact, that the decay of the plant arises entirely from some deficiency in the soil upon which it subsists, being deficient in some constituent necessary for its full development; the order I have mentioned, in which the plants disappear, is, however, varied. I found this year, upon one field upon which the seed had been drilled, that the clover plants disappeared in the direction of the rows for many yards together; but I was led to attribute this to the severity of the late winter, as upon those rows upon the centre of the stetches the deficiency was greatest, those portions having been also most exposed during frost; and it has been invariably found that if trefoil with white clover is taken in alternate rotation with red or broad-leaf clover, the hazard of misplanting becomes diminished. With turnips it is also found that if frequently sown upon the same fields, they at length do not succeed so well, and at last are affected by a disease that attacks the roots—known as “fingers and toes,” from the appearance of the knotty protuberances by which it is attended, or by the decay of the crowns of the plants, by which water readily finds admission, and ultimately causes the bulb to decay. Much discussion, with but little investigation, has taken place upon this subject, the *modus operandi* of the generality of farmers; and, although we have some well-authenticated experiments made by Mr. Milburn and others, still I think, with deference to the experimentalists, that they were not made in the best mode to ensure a successful result. It is an established fact, that every description of plant exists upon a soil necessary to its support, or derives support from the soil artificially supplied, but that every plant in its uncultivated state grows in a soil that is supplied by nature with that description of nourishment requisite for its production and support. If we examine the borders of our cultivated fields, we shall find plants entirely dissimilar from the plants found in like situations in other districts, or upon soils of another character, even upon the same farm. Upon the sandy or gravelly soil the white charlock or wild radish corn, marigold, wild tare, poppy, and various other plants abound. Upon the clay portion of the farm, none of these plants will be found to exist; but yellow charlock,

crowfoot, crow's garlick, and other weeds, grow spontaneously, and in abundance. A peculiar fungus of the agaric tribe frequently grows in our pastures: it sheds its spores in every direction; but those only that are shed outwardly vegetate. The fungi from these are produced in the succeeding year, and rank grass grows in the place they occupied in the preceding summer: this circle continues to expand from year to year, the rank grass following the decayed fungi, which only grow upon the outward or external portion of the circle known as “Fairy rings;” and a question is thus propounded to us—why is it so? The reply is, that the fungus having exhausted the soil, upon which it grew the preceding year, of the nutriment necessary to its production, seeks a new soil for its future development; and the grass, influenced by the same law, grows most vigorously upon that portion of the soil that the decayed fungi had supplied with nutriment in the previous year. Every one must have experienced the loss of herbaceous plants from the flower garden; for, with the exception of bulbs which have the power of changing their place, they disappear year by year, until they are all gone; but if, when the borders undergo their winter culture, the precaution was taken to have each plant removed to the place occupied by its neighbour of another class, their existence would be prolonged. By inference, I therefore assume, first, that clover is sown upon soils totally uncongenial to its production; secondly, that it is sown upon soils exhausted of nutriment necessary for its support, by previous cropping with that plant, without sufficient time having elapsed for nature to restore the substance which is necessary to its growth, and which the previous crops had exhausted. The same reasoning applies to turnips, and to every other vegetable, borne out by the circumstance that on soils congenial to their production they are not so liable to fail as upon soils that are uncongenial. Newly broken up pasture or wood land will produce clover and turnips without the slightest chance of failure for a long period, in orderly rotation; whereas the adjoining fields are just as certain to fail: and before I conclude these observations, I beg to state one mode whereby much of this evil might be remedied. If the old arable land, after being thoroughly tilled, was inoculated with a portion of the grass turf from the adjoining pastures, and the pastures from which the turf had been taken were ploughed up and brought into arable cultivation, a double advantage would be derived: the newly-made arable land would produce clover, turnips, and grain crops, in point of perfection far beyond that of the old arable land; and, if the management is judiciously carried out, that which was arable will produce pasture grass equal, and in some cases superior, to that from which it was derived; the cost of inoculating varying from 30s. to 50s. per acre. I fear I have trespassed so long upon your patience, that the further examples I had proposed to bring before your notice must wait a more convenient opportunity; and I shall therefore conclude with some general remarks and observations that I think may be interesting. That portion of the vegetable kingdom upon which I have imperfectly been treating is a subject that opens a wide field for investigation and study. The parasitic *fungi* alone would form

a study of themselves, that would demand the space of a life to investigate. As we descend in the scale of animal life, we find perception and instinct more fully developed: the little ant, that is scarcely noticed in our pathway, has intelligence superior to that of the elephant—the animal we place highest in the scale of intelligence. The parasitic fungus with which our vines are affected appears first as a small blotch upon the surface of a leaf, and then spreads so rapidly, that in the space of a few days every branch and leaf is covered with minute spores as thickly as if lime or flour had been carefully dusted over their entire surface, whilst the fruit is covered as entirely as if first moistened and then dipped into those substances; with millions as cyphers to define number, and computation to infinity for their enumeration, the human intellect is still left behind in the attempt to convey to the minds of others their number and extent. Yet each of these individual atoms is a spore, or seed vessel, containing thousands of sporules, all endowed with vegetable vitality; each of which is capable of reproducing its species, whether taken up by the atmosphere, or returned to the soil to remain quiescent until a combination of circumstances concur to bring them into active life. As I before stated, they have vegetative powers unknown to vegetables. Imagine a quantity of potatoes strewed indiscriminately over the space of an acre of land, and imagine every potato throwing out a radicle or shoot exactly in the direction of each potato nearest to it, and those to others next in succession to them, and so on over the whole surface until the whole intervening space is filled in with these shoots: you will then have an idea (a magnified one) of what is progressing upon every portion of the leaf of a vine infected by these destructive agents; every pore of every leaf becomes penetrated, until every portion of the vegetable sap is extracted, and the plant withers and dies by exhaustion alone. Again, how frequently has the eye of the experienced agriculturist watched the progress of a field of wheat upon its near approach to harvest! Luxuriant and promising as it may be, he observes a sickly tint of blue mixing with the rank-green colour of the leaves and stems, as certainly indicating incipient disease as the hectic flush upon a fair cheek indicates consumption. Small protuberances appear first upon the stem; these increase in size, and in a few hours burst through the epidermis, and the spores of the fungus become protruded in myriads; the straw changes to a dingy black, the grain shrivels, and thus luxuriant crops, which only a few days before appeared full of hope and promise, speedily become a blasted and decaying mass not worth the collecting. By such minute agents are the works of man frustrated. *The mildew, the locust, the hailstorm, and the tempest*, alike effect destruction, distinct in character, but alike in consequences. It is feelingly ejaculated by the poet, upon committing seed to the earth—

“Be gracious, Heaven! for now laborious
Man has done his part.”

And, after all, how much of our success depends upon Providence! “Man soweth, but God giveth the increase.”

Mr. NESBIT (of Kennington) thought Mr. Baker's paper one of the most valuable of any to which the club had ever listened (Hear, hear). With regard to the subject under discussion, he wished merely to remark that there were certain atmospheric changes affecting plants, of which little was at present known. The atmosphere was not always in the same condition; it changed not only in particular localities, but throughout the general mass. And the changes, he believed, were not dependent alone upon circumstances connected with our planet, but also upon far more distant influences. Diseases appeared and disappeared in a remarkable manner, depending probably upon atmospheric conditions. The cholera was of recent introduction; while the plague, of earlier date and different characteristics, was no longer known. Formerly there were murrains in cattle, and other forms of disease, which had since disappeared. The potato disease was entirely new, and no one could explain the peculiar conditions upon which it depended. It was his belief that, however such diseases might be modified or mitigated, they depended in a great measure upon circumstances totally beyond human control. With regard to diseases of the vine, Mr. Baker mentioned sulphur as having cured them. Whilst he (Mr. Nesbit) was in France last year, that subject was discussed at the French National Agricultural Society, of which he was a member, when it was shown that a mixture of lime, sulphur, and water, boiled together, then diluted with a considerable quantity of water, and sprinkled over the vines, completely cured the disease. He believed there were many diseases of plants which arose from the want of sulphur, or which might be cured by its application. He had in his own experience known the mould in the hop cured by sulphurous compounds. When gypsum was first introduced into this country, its effects were almost marvellous, owing to the fact that sulphur or sulphuric acid was much wanted in the soils. With regard to the potato disease, he had known cases in which sulphate of soda or sulphate of potash had been applied as manure, and in which the disease had not appeared at all, or only in very mitigated form. From what he had seen, he thought it possible that the potato disease might arise from a want of sulphur in the soil, or, if not, that the application of sulphur might cure it. Fingers and toes in turnips arose from a want of lime in the soil, and he had known many cases where the application of good lime or quick chalk had entirely prevented the recurrence of the disease; he believed that a little salt mixed with the lime would be beneficial. He perfectly agreed with Mr. Baker in reference to the propriety of changing arable land into pasture; he did not refer to water meadows or meadows contiguous to rivers, but to ordinary meadow land. The mildew in wheat depended upon too great luxuriance in the plant, the result of too much nitrogenous manure in the soil, or too much rain, which brought down nitric acid and ammonia. If they could predict the quantity of rain that would fall in certain seasons, there would, he thought, be no such thing as mildew in the wheat; but meteorological science was not yet sufficiently advanced for that purpose. There were many substances that would check too great luxuriance, and among them, lime and salt; 5 cwt. of salt, or 3

cwt. of lime per acre would generally prevent the luxuriance and check the mildew; but in soils full of vegetable matter, as in Cambridgeshire and Huntingdonshire, a ton had not proved too much.

Mr. TRETHERY (of Silsoe, Beds) thanked Mr. Baker and Mr. Nesbit for the valuable information they had communicated, observing, however, that the proposal to convert arable land into pasture would certainly not be received with favour in Leicestershire, and other grazing counties.

Mr. SYMS (of Sherborne, Dorset) said he had come to the conclusion, from what he had heard and seen, that it was impossible for a farmer to prevent his crops from being blighted, the causes on which the blight depended being beyond man's control.

Mr. NESBIT thought we should not stop in our search after truth, because we had not arrived at the knowledge of all truths. Learned societies were now engaged in obtaining barometrical and thermometrical observations in all parts of the world, from which perhaps laws might hereafter be deduced that would enable them better to understand the atmospheric phenomena affecting agriculture, and thus give the farmer greater security against the diseases to which the produce of his land was so liable.

Mr. THOMAS (of Lidlington, Beds) considered the paper read by Mr. Baker one of the most valuable and interesting of any offered to the members, and he was quite sure that the more they came to consider it, in the report which he was glad to hear the committee had resolved on circulating, the more would they have to thank Mr. Baker for his exertions. He (Mr. Thomas) agreed with Mr. Nesbit in thinking that without some means of predicting the state of the atmosphere, it would be impossible so to prepare the wheat crops as to be certain of escaping mildew. Salt, he believed, was very useful in checking that extraordinary degree of vegetation which was produced by an excessive amount of nitrogenous manure; and he thought it was one of those applications to which the farmer had not paid sufficient attention, especially in regard to those lands that were likely to grow too much straw.

The CHAIRMAN expressed his concurrence in the opinion of Mr. Baker respecting the influence of barberry, and mentioned several instances confirming that opinion. Late sowing and thin sowing were, he thought, productive of mildew; for when he had sown in good season, and had been tolerably liberal with his seed, he had scarcely ever suffered from the disease. With regard to potatoes, he had applied salt and lime (in the proportion of one part of salt and two of lime) with very general success. He applied forty bushels of the mixture per acre, put broadcast upon the soil before planting. With that application on a gravelly soil he had never suffered from the potato disease.

Mr. BENNETT (of Cambridge), in common with several gentlemen around him, felt he could not do justice to his own feelings if he did not add his humble testimony to the ability which their mutual friend (Mr. Baker) had displayed in opening the subject of discussion that evening (cheers). He (Mr. Bennett) regarded it as one of vast importance to agriculture. On the subject of

mildew in wheat, there was a circumstance still very fresh in his recollection, although it occurred about forty years ago—on his leaving home to commence farming in West Norfolk. There was a neighbouring parish—the parish of Feltwell—where mildew was so general and so calamitous that the farmers had pretty well given up the growth of wheat altogether, and substituted other crops in lieu. In those days there were many old hedges and bushes growing irregularly about the parish, among which there was much barberry. A better system of husbandry led to the destruction of these old hedges, and the insidious enemy also fell in the general destruction. The growth of wheat began to increase, and in the course of a few years mildew at Feltwell became the exception, and not the rule (Hear, hear). During the long interval which has ensued, he had had several opportunities of witnessing the mischievous effects of barberry bushes on the growth of wheat. Indeed, so late as a year ago last harvest, he was on his way from Royston Market, and observing a dark streak in an oblique direction across a fine field of wheat, nearly fit for the sickle, and still worse near the hedge by the roadside, he was induced to get out of his chaise and go to the spot where the disease was most virulent, and there sure enough the lurking barberry bush, though small, was flourishing. The disease seemed to extend leeward from the direction in which the wind had been recently blowing. There were, however, many other causes of mildew. On dark-coloured rich land, full of vegetable matter, wheat was most subject to be attacked; and he had sometimes suffered by too anxious a desire to have his crop quite up to the mark in over-dressing the land, not knowing what kind of season we were to have. That kind of artificial dressing (such as nitrate of soda) which produces the greatest rankness in the stem of the wheat, aids most the ravages of mildew. Crops also which tiller much in the spring and summer generally fare the worst whenever this disease prevails. There were also some varieties of wheat far more subject to attack than others. He could give many proofs of this. He would name but one. Some five years ago he was visiting their late lamented friend, Mr. Spearing, in Hamp-hire, who was thrashing some very fine white wheat. He said it was Earl Ducie's long straw white wheat. He (Mr. Bennett) purchased five quarters, and a splendid crop it produced; and, although somewhat mildewed, it was worth more in the market than any other wheat. He increased the growth of it, and sold some among his friends. All spake alike in praise of it nearly up to reaping time, but the harvest of 1851 was a fearful season for mildew. The hopes of the growers were pretty generally blasted, except those of two gentlemen who grew it upon some thin, weak, chalky soils, where it produced by far the best crops, and pretty well escaped the mildew; and on these soils they continue to grow it. But he (Mr. Bennett) had been compelled, after repeated trials, pretty well to drop it, except so far as mixing it with red wheat, where the same ill effects had not followed (Hear, hear).

Mr. PAIN (of Winchester) made some observations on the growth of clover. It was found impossible, he said,

in Hampshire to grow red clover more than once in eight years; but when the land was getting "clover sick," the cow-grass clover would grow where the common red clover would not. He could not agree with Mr. Nesbit's observations about the conversion of arable into pasture, such conversion requiring, in most soils, 15 or 20 years to complete it.

Mr. BAKER then replied. He explained the mode he had adopted of applying sulphur to vines. The sulphur, he said, was put into a piece of muslin or "cheese cloth" immersed in water, and well worked with the hands. The water was then applied by means of a syringe, first striking the under side of the leaf, and afterwards pulling on the upper. A second dressing was sometimes required to complete the cure. With regard to the potato disease, he was quite satisfied from experiment that what would prevent it one year would not prevent it in another. He was not surprised to hear objections to the conversion of arable land into pasture by inoculation. He had, however, seen many instances in which that method had been adopted with the greatest benefit, the inoculated portions frequently making better pasture land than any other. It might not, however, succeed on such fine lands as were found in Lincolnshire and Leicestershire; but in almost any other district the method might be safely recommended. The cost of inoculation

would depend upon the distance the turf was carted: 40s. or 50s. per acre might be regarded as an average amount. With regard to mildew, though it could not perhaps be entirely prevented, it might be greatly mitigated. In examining particular portions of land affected with mildew, he had often found that the previous cropping had been different from that of the other portions not so affected.

Mr. NESBIT said that, although he fully agreed with the greater part of Mr. Baker's paper, he could not subscribe to the statement that wheat could not be grown year after year, for he had known instances in which it had been raised thirty years in succession (a laugh).

On the motion of Mr. TRETHERY, seconded by Mr. PAIN, the following resolution was unanimously adopted:—

"That, although it is impossible with our present knowledge of the diseases and blights affecting plants, as well as of the effects to which they are liable from atmospheric changes, to suggest any certain means for their cure or prevention, still these evils may to some extent be mitigated by cultivation, and attention to the suggestions contained in the paper read by Mr. Baker—which, it is submitted, is equally worthy of the attention of the practical and the scientific man."

The proceedings terminated with a vote of thanks to Mr. Baker, and a similar compliment to the Chairman.

MANURIAL INFLUENCES OF NITROGEN.

Vegetable physiologists were as much offended with Boussingault, when he asserted that the manurial influences of substances were mainly due to their nitrogen, as those acquainted with animal physiology were at his similar remark, that feeding materials were chiefly valuable in proportion to the quantity of nitrogen they contain. There is now, however, admitted to be much truth in both these statements; and, while the latter admits of certain modifications to which we shall afterwards allude, the former is pretty nearly established as a general rule—that, on soils in ordinary circumstances, and therefore supplied, at the beginning, with most of the materials plants require, in a secondary degree nitrogen is the principal fertilizing element.

Nor does it seem important (or, at least, nearly so important as it might appear) in which condition it is applied—as the alkaline ammonia, or as the acid, nitric acid; or whether it may be applied as a neutral salt, in the shape of the nitrates of soda, of potash, or of lime.

Mr. Pusey has shown most successfully that the dilute acid may be applied directly to the soil with advantage, without the neutralizing effect of an alkaline base; and, as the Germans sometimes manure by sprinkling dilute sulphuric, he manured successfully with dilute nitric acid, and obtained in several instances as much result in the grass crop by the

application of dilute nitric acid as by ammonia itself, and nearly as much as by the application of nitrate of soda itself. He thus sums up the general results of his experiments: "The nitrogen of most manures is committed to the soil in a neutral state; capable, therefore, of uniting either with oxygen, to become nitric acid, or with hydrogen, to become an alkali ammonia. Some few manures contain ammonia ready formed; some few others, nitric acid. It seems clear that the neutral nitrogenous matter is converted into ammonia or into nitric acid before it is absorbed by the plant. So that we have only two alternatives—not three. But it is uncertain, as yet, whether plants can feed indifferently on each of the two substances, or whether one of these is first transformed into the other—whether, that is, the acid is changed into the alkali, as Dr. Wilson deems possible, and Dr. Hartstein asserts, or whether what appears a more easy transformation takes place, and ammonia is changed into nitric acid."—*R. A. S. Journal*, p. 382, vol. xiv.

Offended at this, Dr. Anderson, in a late paper before the Highland Society, rebuts the general drift of Mr. Pusey's paper—which is, to show that the nitrate is as good a mode of supplying nitrogen to the soil in that shape as guano is, or any other product which supplies it more in the shape of

ammonia—and charges him with ignorance of Kuhlmann's experiments having an opposite tendency,

The fact is, however, that Kuhlmann's experiments proved both ways. He commenced them at Lille, in French Flanders, in 1843 and 1844, and continued them in 1845 and 1846; and though some gave an excess of produce in favour of guano of 4,500lbs. of hay, another afforded a reverse increase of nitrate over guano of 6,500lbs.

Recent experiments have come up to the rescue. To Mr. Pusey himself an experiment has been communicated, in which 4 cwt. of guano gave 270 stones of hay; and 2 cwt. of nitrate, with 1 cwt. of salt, gave 300 stones; the product without manure being only 140 stones. An experiment on oats has been lately published, wherein 2 cwt. of Peruvian guano gave 27 cwt. 3 qrs. 16lb. of grain; while 104lbs. of nitrate gave 23 cwt. 1 qr. 25lb.

Mr. Pusey shows that nitric acid as well as ammonia is contained in the rain-water taken from the country in the vicinity of Oxford, as it was by Barral at Paris, and proves that, assuming the fall of rain to be 28 inches per annum, at that rate, he discovered, the nitric acid would give 41.42lbs. of nitrogen per acre.

Again, Mr. Pusey suggests the probability of the plant having the power to assimilate nitric acid directly. It is remarkable that Liebig attributed to plants the power of transforming ammonia. "Ammonia," he says, "by its transformation, furnishes nitric acid to the tobacco-plant, sunflower, &c., when they grow in a soil completely free from nitre."

We are mainly interested, however, in three practical facts which the subject of this controversy opens up. The first is, that there may be great waste in applying ammoniacal manures to calcareous soils. On clays, it may be applied as carbonate, because they can detain the ammonia; but on chalks and limestone soils, it is more than probable, both from the facts and experiments of Mr. Pusey, that, careful as we may have been to fix it, and expensive as may be the mode of effecting this, all may be defeated in a soil where lime is present, and it may be dissipated and lost in the atmosphere.

The second is, that the mixture of lime and manure in a compost heap may not be so objectionable as closet chemistry may seem to indicate. A manure-heap so arranged is exactly a nitre-bed; and on a limestone soil, it may be a better mode of preventing the loss of nitrogen, by converting it into the stable acid, than by allowing it to be carried to the soil as ammonia, to be dissipated by the lime.

The third is, that the same economy may possibly apply to the well fermenting of manure. Mr.

Pusey alludes to the fact that nitrates are repeatedly found in well-rotted dung; and not unfrequently nitrate of ammonia is discovered in such manures. This may, after all, compensate for a little loss of ammoniacal vapour, so often insisted on as being highly detrimental.

While on the subject of nitrates, we must refer to the vast waste of manure in the destruction of the lime of old buildings pulled down. They are vast masses of nitrate of lime, and too often used only for the mending of roads and other similar purposes. We remember, when younger, an old farmer laughed at, for carting this dry substance away to his "deaf hills" (his barren spots of soil); and we have, as such, witnessed the most satisfactory results. Corn, and turnips, and seeds, after this, grew green and vigorous. The following experiments were made by Kuhlmann, and which are alluded to, but not given, by Mr. Pusey in his paper:

In 1844, he applied top-dressings of nitrates of soda and lime, and the result was:

	Kilogrammes per hectare.
No. 1. Nothing	3,820
No. 2. Nitrate of soda	5,690
No. 3. Nitrate of lime	5,397

In 1845, he applied nothing to any part, and the produce was:

	Kilogrammes per hectare.
No. 1	4,486
No. 2	4,390
No. 3	4,420

In 1846, he again applied the same as in 1844, and the crop gave:

	Kilogrammes per hectare.
No. 1. Nothing	3,330
No. 2. Nitrate of soda	5,383
No. 3. Nitrate of lime	4,023

The quantities of British guano thus wasted are enormous; and yet how perfectly deodorized, and how innocuous in every respect is this most readily available receptacle of manure, within the reach of farmers every day, and extremely light of cartage!

SHEEP-SKIN MATS.—These are prepared by stretching the fresh skin, well furnished with a coat of wool, with the wool-side down, by means of tacks at the edges, and then rubbing the skin well with a powdered mixture of equal parts of common salt and alum—repeating the operation twice afterwards, on the two following days. It should remain exposed to the air, but not to the sun, till well dried.

THE SCOTCH HIND SERVICE.

An Englishman, or mere Southron, knows tolerably well what to expect when his attention is called to Scotch farming. He has found from experience that the moral of any such discourse will be a lesson for himself. It is in every way a superior system to that to which he has been accustomed, and the sooner he proceeds to imitate it the better will it be for him. We have Scotch landlords, Scotch tenants, and Scotch bailiffs, all offered to us in the way of example; the Scotch labourer even, as we have been often assured, is far above our own in skill, intelligence, and social condition. Indeed, it would be scarcely possible to conceive him otherwise, considering the higher attainments and enlarged views of those with whom he is associated in the advance of agriculture.

The picture, however, has been somewhat over-coloured. Custom has gradually reconciled our friends in the north to a practice, the fearful effects of which they are only now just beginning to admit. It would appear, in fact, that they were hardly aware of the ills they were encouraging. Scotch landlords, the model landlords of the United Kingdom he it remembered, have publicly confessed, within these few weeks or months, that they had no previous idea of the disgraceful state in which they have now found certain portions of their property. The tenantry themselves have, less readily perhaps, been brought to allow, as they needs must, the existence of the evil complained of. And this disgrace to the cause of Scotch agriculture is the condition of the labourer—of the hard-faring, hard-working hind, so continually cited to us as the model of what a farm servant should be.

The curse of Scotch farming is this plan of hind service—the man who, as we supposed, lived in the house with, and constantly under the eye of, his employer. It is thus, at least, that we should here interpret the agreement. How wofully different the “bothy” arrangement into which it has gradually fallen. With all the credit and honour we have been told to pay to the agriculture of the north, there are few who have not witnessed it who could picture how the labourer is cared for in this perfection of a system. In assisting such to do so, let our testimony be from the scene itself—The description from a Scotch newspaper (the *Edinburgh Guardian*), as quoted and corroborated by a Scotch farmer, Mr. Allardice, of Tayport, Fife :

“Are our readers acquainted with the appearance of a bothy? If not, we will describe it to them, such as we saw it at a respectable farm-steading in the kingdom of Fife. The bothy was one of the most ruinous-looking of the outhouses

(bothies almost invariably are). It appeared to have been used as a stable, and abandoned because not sufficiently comfortable. There was but one window of four small panes, most of which were broken, and either stuffed up with straw or mudded with paper. On entering, you descended into a heap of litter, which in summer was dust, but in winter mud; because, the earthen floor being below the level of the ground outside, every shower that did not penetrate the roof, at least sent in its contribution of moisture by the door. The furniture of this wretched abode consisted of the chests of four men-servants, two box-beds, a pot, a ruinous grate, a bellows without the nozzle, a water-bucket, a few tin pannikins, and a heap of fuel. We scarce think any article of the stool genus was to be seen; but if it was, it must have been in so dilapidated a state as not to be recognizable: certainly there was no chair. The ceiling had at one time been plastered; but the plaster had fallen in most parts, and in some the wood also was broken, and tufts of hay from the loft above hung down. To add to the beauty of this inviting interior, some former inmate of the bothy, in a drunken fit probably, had traced rude figures and obscene words on the parts of the ceiling that remained, by passing a lighted caudle close to it, and marking it with the smoke. A cloddish-looking young fellow was seated on one of the chests, and to our interrogation he replied, what we knew was the case, that the men in the bothy lived entirely on milk and oatmeal, and that animal food was a luxury unknown. They washed in the water-bucket, or at the mill-dam, when they did wash, and dried themselves with the sheets of their beds, as they had no towels. This bothy, wretched though its accommodation may appear, is, we believe, a fair type of its class. We have seen others even worse. We have known them swimming with the moisture from the adjoining stable, so that the inmates had to place stepping-stones in the floor in order to reach their beds or the hearth. In many it is nothing uncommon for the men to find themselves under a small wreath of snow when they awake in the winter mornings. Is it any wonder that immorality of every kind is of rapid growth under such circumstances? Reading is out of the question, even though the long severe toil of the men did not wholly unfit them for it, which, except when the desire for knowledge is very strong, it effectually does. If amusement or comfort of any kind is desired, it cannot be found in the bothy, and the men are driven out to seek in drunkenness and debauchery the only enjoyment of which their position allows them to partake. After such treatment, is it remarkable that the poor labourer comes to hate his employer with an intense hatred? They know, and do not hesitate to say, that their masters care more for their cattle than for their men, and in many instances, we are sorry to say, they are perfectly justified in such assertions. We have known horses in a cold rainy day taken in from the plough, and the servants who attended them sent out again to mix the compost heap or scour ditches. We do not say such treatment is universal, but we do say it is too general, and servants seeing the comfort of brutes more attended to than their own, have as a consequence become even lower than the brutes in morals and manners.”

We call attention to this subject, and it is worthy of the attention of us all, if not as an example, as a warning—altogether on the authority of the Scotch them-

selves. Our evidence so far has been that of a Fife farmer volunteering his corroboration of what may be seen in that county. Let our next witness be from a higher grade in society, a Scotch landlord, a very good one as we believe, and no less a man than his Grace the Duke of Buccleuch. He gives us only more corroboration:—

"He thought it would not be disputed that, generally speaking, throughout Scotland, the habitations of these labourers were very defective, especially in those accommodations for comfort and delicacy. In former days the farm-servant was accommodated in the farmer's house, where he took his meals, and so was under the moral control of his employers. But now the farm labourer was put into a bothy, generally a most wretched place to live in, and often the worst building on the farm. He could not blink the question involved in the subject. They had not come there to bandy compliments to one another, but to speak the truth. He confessed with shame that he could show as bad specimens on his property as could be found in Scotland. He would not conceal it, that the condition of many of the cottages on his estate was as bad as could be. He examined a number of these cottages himself, and found many of them quite in a falling-down state. In one of them, when he took a box-bed out of it, down came the roof. How could they expect, when they saw men, women, and children, all living and sleeping in one apartment, that they could be otherwise than demoralised? Could they wonder that all their delicacy of feeling was destroyed? Mothers had said to him, how could they bring up their daughters with respectability when there was not that separation of rooms which there ought to be?"

There may be something for many of us to ponder over in this. The manner in which the abuse has arisen or increased says, we are afraid, but little for the discretion with which the Scotch farmer has used that liberty of action and general control allowed him. His Grace goes on to say:

"There was a great disinclination on the part of the tenantry to the landlord taking these cottages into his hand. They said they must have every single thing under their own control. It was all very well for them to say that, as regarded the lodgment of their domestic and special farm servants; but it did not follow that it was absolutely necessary that all the cottages of the agricultural labourers should belong to the farmer. He did not think that it was right that the farm labourer should be bound down to work for one man only. But the person who really benefited by the landlord taking the cottage into his own hands was the farm labourer himself; and he had seen the moral effect produced by providing better houses for this class of labourers, in a quarter where thieving and poaching had formerly been the disgrace of the people; but since their houses were improved, there was a great and beneficial reformation in these respects. It was really gratifying to see the change which took place in the feelings of these people towards their landlord, when they knew he was taking an interest in their welfare. Here, when he passed, they showed they regarded him as their friend, and were not filled with unpleasant suspicions about him."

It does sound extraordinary that, if the labouring man has been thus palpably wronged, the owner of the property should not sooner have become acquainted with the ills from which the other was suffering. So, however, it has been. It was not

the Duke of Buccleuch alone who ingenuously acknowledged his ignorance of the wretchedness existing on his own estates. A yet more practical landlord, well known to us all from his exertions in the cause, and the opportunity he would give to all, but more especially the working classes, has good reason to look at home. At the same meeting from which we have quoted the Duke's speech, Lord Kinnaird admitted that "he had had no right idea of the bothies on his estate. Thinking such a matter was an arrangement purely between the farmer and his labourers, he had not visited them till lately; but having now done so, he felt they were a reproach to him, and must be improved." They are a reproach to him; but not to him alone—to the farmer intrusted with this "arrangement" yet more so, and to the agent or factor in whose hands the chief care of the estate may rest, perhaps even in a still greater degree. It is a duty, in the performance of which the characters of all are concerned, and by which they will all now come to be tested.

Such an inquiry, or rather such an exposure, as this must do infinite good. Let our friends here, as they read over the admissions we have quoted, consider whether they, too, have anything of the "bothy" system existing—whether they can be said "to care more for their cattle than for their men," and whether, as landlord, agent, or tenant, the condition of the labourer is "a reproach" to them. We must all learn, like Lord Kinnaird, to look at home before we essay to teach or complain of others, and then we may start on our northern tour with some heart. *Then*, as we are told of long leases and liberal covenants—every man free to do the best he can—when we see high-farming and hear of its returns, we may venture to put the doubt rankling within us, "Where are the bothies, and what share has the labourer in this profitable business?" Rest assured that Scotland must be prepared with an answer.

It is but fair to say that the agitation of this question is chiefly due to the Scottish clergy, with the Reverend Harry Stuart, of Oathlaw, at their head. By this gentleman's own showing, he became a member of the Forfarshire Agricultural Association* with the understanding that the improved condition of the labourer should be one of the objects of the society. His wishes were very cordially responded to, and, at the invitation of the members, he read them a paper, now far more widely known in the pamphlet, "Agricultural Labourers as they were, are, and ought to be, in their social condition." Few men would seem to have been more worthy of their subject, and few subjects more worthy the attention of an agricultural association.

THE POTATO DISEASE.

The Sultanness Scheherazade, in the "Arabian Nights' Entertainments," prolonged her life night after night by a thousand-and-one stories, or parts of stories, to amuse the Sultan Schahriar until he had forgotten the injury he had sustained, and so established herself as the permanent sultanness of him who had sworn to have a new successor every day of his life. The same fate seems to be the share of the unravelled potato disease; and the thousand-and-one theories of the cause, and the same number of failures of cure, seem to amuse, to employ, or to disgust the parties who, from philosophical study or from more self-interested motives, try one after another of the cures or investigate one after another of the assumed causes of the disease.

We speak not to discourage investigations as to the cause, or experiments as to the cure, when we say that we look with the greatest jealousy at any theory of the one or any catholicon for the other, because we feel we cannot trust either so implicitly as even to recommend the trial, much less the adoption, of any particular scheme, even now when the potato-planting season has come upon us; nor can we hold out any hopes that this year will be at all better than its predecessors; nay, more, we believe instances have occurred where the disease has already made its appearance in forced vegetables of this kind with unwonted virulence—in all cases the prelude to a visitation.

It is simply with these feelings that we refer to the pamphlet of the Hon. Grantley F. Berkeley, published by Longmans, where he ventures to start a theory of the disease, and to recommend a mode of cultivation, in which he professes to have found a cure harmonising with his hypothesis. The cause he thus describes. After showing it to be the result of no entomological visitation, not referrible to early frosts, excess of rain, or extreme drought, but is a pure vegetable epidemic, like the Asiatic cholera amongst mankind, and would, he argues, if in the animal, be treated as a fever, thus he observes: "If the state of the plant is closely observed when first assailed, every indication that vegetable life can demonstrate of internal or destructive and feverish heat is shown in the dried, the sere and yellow, parched-up leaf. The juices of the haulm are palpably absorbed, the extremities fail, then the stem, and finally the root is destroyed. The first plague-spot on the leaf becomes so dry that it may be set on fire with a lens."

He then goes on to show how the introduction of foreign, the application of highly stimulating, and the

accession of highly pulverized animal manures have been used of late years, and infers that a vegetable epidemic, once imported, may be kept up, sustained, and rendered permanent, by these additions to ordinary culture. Now, while we are by no means certain that these manures may not have to do with a vegetable epidemic, as filth and dirt have with human epidemics; although we have no means of saying that the disease is not a fever of a cold-blooded plant, as it may be of a warm-blooded animal, still we have known so many instances of a fine healthy haulm succeeded by as healthy a crop at taking-up time, and yet before spring, in the pits or houses, the tubers alone have been destroyed by the disease. True, the fever may have been in the tubers, and not in the haulm, incipiently at work; only it is further remarkable that in more years than one the whole of a district has been attacked and ruined in a single night. We would say just so much, by way of guarding both facts and hypotheses in reference to the cause of the disease; but our main object is, to deal with the practical part of the subject—the remedy.

The experiments extend over twelve years, and the agricultural public are greatly indebted to Mr. Berkeley for attending to, and more particularly for recording them, as few will take the pains to follow out experiments of this nature for such a purpose, and hence they are peculiarly valuable. He takes a piece of land, and for twelve years keeps it always under potatoes. He first tried entomological dressings, as lime, soot, chalk, and ashes, on given parts, but without success, except that he learnt that the hotter and more drying his manures, the more complete was the failure. He then persevered with cultivating the potato (an exhausting crop) year after year, and by this and other means kept the patient low, and thus, he says, prevented the fever. Once, however, by oats he reduced the sufferer below par; but, as a glass of brandy is sometimes given before bleeding, so he manured up to a certain point, and has been successful. We give his directions in his own words:—

"As soon after the crop is gathered as possible, the land should be ploughed six inches deep, and left fallow to the frosts of winter. In February or March, according to the weather and state of the ground, the field should be harrowed and dragged and rolled, if clots [clods] of mould require to be broken. The manure [previously described 'as short, well-decayed, and easily soluble to the earth,'] should then be hauled on, and deposited in heaps

for drilling and ploughing in with the potatoes. All planting should be over at latest in March, and on no account whatever cut the potato for seed, and for this serious reason: while the vegetable is in this feverish state, the moisture contained in it should on no account by cutting be induced to exude. I am perfectly certain, by experiment, that now, while this epidemic is in existence, if cut, and the spring chances to be very dry, a hundred potatoes for one in the olden time will become completely rotten. * * The moment my crop is ripe, the latter end of September or early in October, if the weather is clean, I raise it. The potato is then, with as little dirt attached as possible, put into a dry barn, and subsequently covered with straw. They should be then constantly looked over, and any bad ones removed."

To others he recommends, whose land is richer, to apply for a time no manure at all, and to remove the diseased tops and roots from the land as speedily as possible.

Now, that he has found for some late years less disease is evident. He gets 23 sacks of potatoes, worth £17 5s. for four acres, at a pound per acre rent, and he does not manure too highly. Will he permit us to say we are sorry to have no faith in the infallibility of his cure. We happen to have a plot of ground which has grown potatoes only, owing to a peculiar circumstance, for about twice the period he names—at least, 24 years. It has always been dug; has never been highly manured; whole potatoes are always planted; and yet we have our modicum of disease often not developed till they are all taken up, for they are secured readily: we sow the same as he recommends, and we have not escaped the disease in any year for the last seven.

We quite approve of less stimulating manure being used than is often the case—so far his hints may do good; but we caution our readers against imagining it is anything like a certain prevention of the disease.

PORTABLE RAILWAY.—A new and ingenious plan of portable railway has been patented by Mr. W. Crosskill, especially adapted for the use of common road carriages, with common wheels, as well as for railway carriages; which, however, is only advocated for situations where the expense and time necessary to establish a permanent line prevents its being carried out. Mr. Josiah Parkes, the eminent engineer of Great College-street, has inspected and reported on a line of 1,000 yards, now laid down at Beverley, and is designed for service at Melbourne, and for experiments for the information of Mrs. Chisholm and others, previous to her taking out a portion to Australia. In this report, Mr. Parkes states that the railway is well designed for the object intended; it is simple and light, but quite strong enough for loads from 2 to 4 tons, drawn by horses; it is readily put together, laid down at a small cost,

and well adapted for practical use. The line at Beverley is purposely laid down on a very irregular piece of ground, presenting very sharp curves and steep inclines; yet, with some heavy experiments and severe tests, it stood them most successfully. The contrivance is peculiarly adapted to Australia, as the merchants and carriers could use their own carriages, and thus diminish outlay. Mr. Crosskill has also introduced a double line for still more important purposes, by which army carriages, parks of artillery, &c., might be transported. The cost is only from £1,100 to £1,400 per mile.

CATTLE TRAFFIC PER RAILWAY.

The following is a summary of the Cattle Traffic Conveyance by the railways of the United Kingdom, for the year ending 31st December, 1853:—

	Oxen.	Sheep.	Calves.	Pigs.	Total.
England	968,537	3,502,445	160,538	704,037	5,335,557
Ireland	104,148	203,048	17,732	223,499	553,427
Scotland	180,668	630,745	3,655	28,022	843,090
<i>Total.</i>	1,253,353	4,311,238	181,925	955,558	6,732,074

AMOUNT RECEIVED FOR CARRIAGE.

	£	s.	d.
England	299,975	16	0
Ireland	31,179	18	3
Scotland	30,323	19	4
<i>Total</i>	£361,479	13	7

The want of agricultural statistics for Great Britain prevents any comparison being drawn as to what proportion the cattle carried by railway bears to the quantity in the country; but a comparison can be made as regards Ireland, and the result is as under:—

Oxen, of all ages	1 in 25½
Sheep and lambs	1 in 12½
Pigs	1 in 4¾

Upon reference to the above table, it will be observed that, although 289,660 more animals were conveyed by the Scottish than by the Irish railways, yet the receipts of the latter exceeded the former by £850. This is owing to the peculiarities of the two countries. In Scotland, great numbers of sheep have to be carried at exceedingly low rates, in order to compete with the common roads, by which large droves are moved at little cost; whilst in Ireland the stock of sheep is comparatively small, the pig being the favourite animal, and for the conveyance of which much better rates are obtained. We therefore find that whilst 630,000 sheep were carried in Scotland, only 208,000 were carried in Ireland; but on the other hand, whilst Scotland carried only 28,000 pigs, Ireland carried 223,000.

The value of the cattle conveyed by the railways of the United Kingdom during last year may be estimated as follows:—

Oxen	£13,786,883
Sheep	6,511,857
Calves	303,293
Pigs	2,868,674

Total. £23,475,707

MR. HUTTON'S SYSTEM OF CATTLE FEEDING.

We have frequently shown the intimate connexion between the production of fat animals and the growth of corn. It seems, as far as our present knowledge is available, that this connexion is so intimate that either the relation of stock and corn must be kept up, or the difference will have to be made out of the staminal energy of the soil itself. In other words, when a considerable quantity of stock is not fattened on a farm, the soil will have to suffer in fertility, unless the loss is made up by the purchase of artificial manure. Nor are we sure that for any great or even considerable length of time, the purchase of any one artificial manure will entirely supply the place of keeping stock. We know an instance where this was attempted. Some land near a town was annually denuded of its straw, when artificial and purchased manures were very liberally applied; but the result showed a falling off in fertility, which was soon restored by the renewal of applications of farmyard manure.

We again are cognizant of an instance where the most important evidence of the connexion between stock and corn—between cattle fed and crops produced—is afforded; and this is the estate of Mr. John Hutton, of Sowber Hill, near Northallerton, who has been taking into hand for some years poor, wild, worn-out farms, as his tenants dropped, until he has about fifteen hundred acres or more—a large quantity for the district—and has followed out the system of steam-boiling linseed and meal, combining this with chaff, and so feeding a large number of cattle. He has thus renovated the poor, worn-out soils, and reduced the whole to a state of garden cultivation, combined with the successful feeding of prime shorthorn steers.

His habit is to make no secret of his proceedings; but, year after year, invites large parties of his neighbourhood, and of the most spirited farmers from different localities, who inspect the whole of his proceedings, and are invited to offer remarks on his plans, and to whom he gives every information. A party of some 29 agriculturists of this class lately inspected his farming operations, and the clean, healthy, and happy condition of fifty well-fed shorthorn steers ready for market, the sleek and almost fat condition of the straw-fold or store cattle in his yards—many worse are sold for fat—the healthy condition of his draught horses, are evidences of the value of the linseed compound on which are fed—the fat cattle to the utmost limit, and the store stock and horses once a day. To

suit the expenses of the times the following is the formula of his feed, and, as will be seen, the cost of feeding is at this dear season not more than six shillings per week. We think the fact is well worth communicating; and as he has no objection to his plans being widely known, he will not object, we are sure, to us giving it to our readers.

COST OF KEEPING A FAT BEAST FOR ONE WEEK.

April 18, 1854.		s.	d.
26 lbs. of meal at 1d. per lb	2	2	
13 lbs. of linseed at 1½d. per lb	1	7½	
Turnips (from 70 lbs. to 80 lbs. per day)	1	6	
Coals	0	1½	
Labour on each beast	0	7	
			6 0

The food given to the draught horses is 1 lb. of linseed and 3 lbs. of meal, at noon, at a cost of 4½d. per day.

The value perhaps of this in promoting the digestion of nourishing food at a time of day when it is important to get the work as rapidly done as possible is incalculable, and the healthy coats of the horses showed that it was suited to their animal economy.

We cannot help thinking that this mode of economizing root crops, and so getting the largest amount of fed animals from the smallest quantity of green crops, using up all the straw most carefully and most favourably for its conversion into manure, is a vast desideratum to the cold-clay farmer. How, he asks, can he get good manure with his small quantity of roots, or how keep stock in any quantity so as to have his manure made by those who are fattening? This plan seems to be a solution, and ever since its introduction by Mr. Marshall, has Mr. Hutton followed it out, feeding or keeping, we believe, something like a hundred beasts per annum. The small quantity of roots per day—taking the minimum of 70 lbs.—would in twenty weeks amount to some four-and-a-half tons only, thus finding all the roots necessary for feeding four cattle on one acre of a twenty-ton-per-acre crop.

We have taken the extreme as to time, for few farmers would feed them perhaps so long, and we cannot help also observing that when a stone of beef, or nearly so, at 7s. 9d. per stone of 14 lbs., can be laid on per week, there is a very ample profit. There is a profit, however, if a considerably less weight than this is added, which is perhaps more frequently the case in cattle feeding; but even if the whole of the expense of feeding were not reim-

bursed in the fattening of the animals, it doubtless would be in the addition of valuable manure to the land.

Another hint at cattle feeding may be had from Mr. Hutton's plans. While you invariably find all the animals quietly laid down until their known times of feeding, you find them all most scrupulously clean. Not a single spot of dirt can be found on the whole, from one end to the other; and this is partly occasioned by the uniform consistency

of their dung with this mode of feeding, which occurs perhaps in no other; but also by the great care in removing every particle, and keeping them all well and uniformly littered. Their comfort and quietness also contribute in no small degree to their cleanliness; and though they are not carried as a rule, the skin is kept in healthy action by the friction of a whisp of straw occasionally applied. Mr. H. has adopted this plan, if we rightly remember, for some six or eight years.

THE CULTURE OF CHICORY.

Chicory, succory, or endive—*wild endive* (for it is nothing more or less than wild endive greatly improved by careful cultivation)—it grows like a lettuce, except that its leafage is rough, with jagged edges. It bears small blue flowers, grows to the height of four or five, or more, feet; it is tap-rooted like the parsnip, but much smaller, and sends its rootlets a great depth, in good loamy ground, upon which it will produce an abundant crop. I grew it some years ago as a fodder crop with great advantage. Pigs eat it voraciously, and thrive well; and no herb is equal to it, in its fattening qualities, for horses. My horses were so fond of it, that my groom has frequently taken a small bunch of green chicory in his hand, instead of a little corn in a sieve, wherewith to catch them in the field; they most readily came for the bite, and suffered themselves to be caught rather than quit it.

My object in writing upon the culture of chicory is to recommend it as a forage or fodder crop, and not its culture with the view of converting the root into that well-known substitute for coffee—CHICORY ROOT POWDER. I shall be happy, at a future day, to give whatever information I possess upon this application of the plant; but at present I shall confine myself to its uses as a forage crop, and its application as food for farm service.

I believe it to be, if viewed in this respect only, a most valuable acquisition to the cultivated plants of the farm. It will grow freely anywhere; and under deep culture and careful management it will produce a surprising crop, frequently growing to the height of seven feet, and yielding three or four luxuriant cuttings in a season, amounting in the aggregate to from twenty to thirty-five tons of green fodder per acre. It will not require replenishing for several years; and the roots will retain their full vigour for six, eight, or ten years, according to the care bestowed in its management. In the first year of its culture, if sown early, it will yield two or three cuttings; but it is not right to cut it too soon—it should be allowed to grow freely in the first season,

so as to gather strength and hardihood. One cutting in September would probably be better. In dry seasons this plant is almost invaluable, being tap-rooted and very tenacious of its hold upon the soil. It is, in fact, nearly independent, and may fairly defy the greatest droughts; and such is the strength of its stems, though very succulent, that it has nothing to fear from rain and storms. Moreover, it is of very early spring growth; and its first leaves being large and tufted, spreading sideways, cover the ground so as to retain the moisture, and thus preserve the roots from heat; and it is also so hardy that the most severe cold and frosts cannot seriously injure it. The quickness and certainty of its growth in all seasons, however precarious, render it most valuable for summer soiling, because it will at all times give an abundant supply of highly nutritious food, and often when other herbage plants are failing from drought or tardy growth. It is, with one or two exceptions, the earliest herbage plant we have in the spring; and the rapidity of its vegetation is such that it will generally afford a good cutting in April, just at the time when cattle begin to long for change of food, and renders the transition from dry winter fodder to such early green herbage highly salutary.

Soil.—It will grow luxuriantly on any soil, and in any cool climate. It grows best—or appears most at home—on deep calcareous soils; but on deep loams it produces the largest weight of fodder. It is found wild in most parts of the kingdom, but abounds most upon dry gravels and thin calcareous soils. As this is its habit of growth—or rather as it is indigenous to these soils—it may with the greater safety be introduced into more general cultivation; and, as it grows well on the poorest of these soils, I do strongly urge greater attention to its culture upon them. It is on such soils that dry seasons are most injurious to herbage; here is a preservative from excessive danger, at least. The rootlets will find sustenance in the subsoil, however dry the surface may be.

Preparation and Management.—The preparation

of the soil for this crop is very simple. On good soils it may be sown after a wheat crop; on inferior soils it is better to follow a pulse or green crop. The land should be deeply ploughed, and harrowed to a fine state, when the sowing may take place. If the land is not clean, it must undergo a partial fallow, as weeds are very pernicious to it in its early stages; it is better to lose a cutting than to put the crop improperly in. When once it has attained a good lead, no weeds can speedily hurt it; its greatest enemy is twitch and other grassy weeds. The crop should be drilled in at 9 or 10 inch intervals, and one inch in depth. A light harrowing may follow; but if the season is dry, a light field-roller will do better. I cannot recommend this crop to be put in along with any ordinary crop, as clover or grass seeds, but think it should be sown alone, as it will so soon require especial attention in hoeing and singling. The chicory seed being small and thin, it does not at first produce a strong plant; hence much care is requisite to tend and nurse them in their earlier stages. No weeds must overrun them, nor must they at any time be neglected. When about four or five inches high, they may be thinned by hoeing out; the crop may then be considered safe, and will last many years with care. The after-culture will consist of regular hand-hoeing in the summer; and in every winter a good coat of well-fermented dung should be dug in with a three-pronged fork, and at the same time all the weeds picked out. If any spaces become visible, a few plants may be drawn from the thicker parts and planted therein. The seed should be obtained from a seedsman on whom dependance can be placed, as it is not generally to be obtained new and good. About ten pounds will suffice for an acre; but frequently sixteen pounds are sown, on account of admixture of old seed.

Application.—This should always be in its green state; for, although it will produce a heavy crop of hay, yet it is so strong and coarse in its nature that no animal will profitably consume it. As a green fodder plant, there are few to excel it. The first cutting may take place in April, but if deferred until May all the better; it will become stronger, more abundant, and more nutritious. The next cutting early in July, the third in August, and the last in October. These cuttings will produce a very large quantity of excellent food. The leaves and stalks, "being full of a rich nutritive milky juice, are greedily devoured by all kinds of stock." They are never tired of it, nor is it in any way deleterious to them; they will do well upon it for full eight months of the year. Cows soon accustom themselves to it; horses reap unusual benefit from it; sheep and pigs thrive well upon it, more particularly the latter. I speak of *cuttings*: it is because I do not think it desirable to cultivate this crop for grazing purposes.

It has frequently been done, both separately and in conjunction with other grasses—*i. e.*, clover, sainfoin, lucerne, &c.—but invariably the chicory plant has soon overtopped the others, and rooted them out; and when sheep have been turned upon chicory alone as a grazing crop, they have not only succeeded in seriously injuring the crop, but the reception of so much young chicory into the stomach, and before attaining its more consistent growth, has also been detrimental to them. The better plan is to cut the whole crop in succession as required, and give it to stock prepared to receive it, either in the fold-yards, summer-sheds, paddocks, or the like; or to horses and pigs in their respective yards. I will endeavour to point out the best method of managing this crop for chicory powder in a week or two: I will only now say, it must have every aid in its growth, and of course remain uncut until the roots are required for use.

CHICORY AS A SUBSTITUTE FOR COFFEE.

"Of all plants which have been proposed as substitutes for coffee, chicory is the only one which has maintained its ground."—VON THAER.

Having in my last paper given a summary of the culture and management of chicory as a forage or fodder crop, I now proceed to give my views of its culture and management as a substitute for coffee.

Culture.—The main points in which the culture for chicory-root powder differ from its culture for fodder are the greater nicety of its management and the time of sowing. The great object now is to produce the heaviest crop of good roots: for this purpose, the deeper the ploughing, and the more cleanly the land, the better to all intents will be the crop. The seed vegetates slowly and grows tardily; if, therefore, it is not kept clean from all those quick-growing annuals that delight to revel in a finely pulverized filth, a certain disappointment ensues, and most probably a loss of crop so far as the root is concerned or depended upon, inasmuch as the root is required to be taken up in the first year of its growth; whereas for a fodder crop it will stand for an indefinite period, and for the first two or three years it will obtain a mastery over almost every annual and most perennial weeds. I repeat, the land must be clean and the surface reduced to a fine mould. When the plants are five or six inches high, they should undergo a very careful singling. Much greater care must now be practised than in singling for a fodder crop; the plants must be left further apart and single. There appears great diversity of opinion amongst cultivators upon this point. It must be borne in mind that in this case the crop only stands one season, and that the plant will not attain its full growth in one season; therefore the

aim of cultivators is to obtain as much produce from it as possible in the season, consistent with the nature of its growth. Hence many say a larger number of smaller plants will produce a greater weight than fewer large ones, supposing in both cases there is a full crop. This must be left to the judgment of the grower, who will take into consideration the state of the soil, season, time of sowing, &c. Every plant requires equal encouragement.

Sowing.—This is another point requiring the best judgment and discrimination of the cultivator, because if sown too early, and the season proves a “growing” one, many plants will run to seed, and are then called “trumpeters,” or “runners.” These will require digging out; otherwise, if taken up with the general crop, they will injure materially the sample. The time of sowing, then, must depend much upon the season, and the state and richness of the land, as also upon the district and climate. In most parts of England, about the second week in May has been proved the most successful time; if earlier, more have run to seed—if later, the crop has scarcely time to attain a sufficient maturity. The best crops, and of most even growth, have resulted from broadcast sowing; but the facilities of culture, singling, cleaning, and taking up, are much in favour of drilling. The rows are usually from ten to twelve inches apart, and singled out at about six or eight-inch intervals. The quantity of seed usually sown for a root-crop is from three to five pounds per acre.

Harvesting.—“The taking up” may commence in October, but the principal month is November, and it may be continued in open weather throughout the winter, as the roots are not much injured by the weather. If practicable, however, it is best to take them up about the month of November, and either convey them to the washing-house direct, or, for convenience, to a suitable spot, to be laid up in graves. It is best to have them at once cleanly washed, and the cutting and drying processes proceeded with as “the taking up” progresses.

The manner of “taking up” is by digging; for although ploughing up at a great depth has been practised, yet experience has shown that the best course is to dig up the roots with a double-pronged fork, very strongly made, the blades being about fourteen inches long. The roots growing to a great depth, much difficulty arises in clearing the ground; hence the digger should have a careful lad to assist him, not only to pull the root as loosened by him on pressing it upwards with his fork, but to pick up all the small pieces and fibres, lest they again take root, to the sad annoyance of the succeeding crop. The tops are subsequently neatly cut off, and the roots conveyed to the washing-house or grave—if to the grave, to be safely thatched down with straw or stubble.

Washing, Cutting, and Drying.—The washing is variously performed; any of the newly invented root-washers are admirably adapted for this purpose, the great thing being to wash the roots clean; they are then cut into small pieces of a size as uniform as possible. Hitherto this has chiefly been done by hand; but our inventive mechanists have perfected machines for this purpose, which do this department of the manufacture very satisfactorily. These slices are then dried in a kiln, in as even manner as practical. In this state it is ready for the general market, and is purchased by manufacturers of chicory powder, who roast and grind it as they do coffee. The loss in drying is very great, amounting to from seventy to eighty per cent.

The culture of chicory for the above purpose is often very unsatisfactory, and truly precarious in its results. The crop varies from six to eighteen tons of roots per acre. The expense is great and profit uncertain. It is stated, “that one and a quarter tons of root (when dried) is an average crop;” and a friend of mine states that his experience gave £19 15s. 6d. as the cost per acre, and £22 10s. as the return per acre. The cost of washing and making into powder, and subsequent preparations, may cost about £5 more. In Morton’s *Cyclopædia*, published by Blackie, we find the following:—“The root, when roasted and ground, is considered to be an admirable substitute for coffee, and as an addition—say, one-third of chicory to two-thirds of coffee—to be an improvement to all sorts. It is more especially employed, however, to mix with colonial coffees; which fact was satisfactorily proved to the Commissioners of Excise, a few years ago, when it was shown that if the consumption of chicory were prohibited, less colonial coffee would be consumed. It is also said to be used (in the leaf) in the adulteration of tobacco, and of porter. Medical men allow it to be healthful, and in some cases prescribe it for a morning beverage.”

The preservation of seed is generally left to our continental neighbours. No difficulty presents itself in taking a seed crop in this country; but as it is not in great demand, it is not worth the trouble: the price is about 2s. 6d. per lb. The seed is very similar to the common lettuce seed; and therefore unlike most agricultural seeds. The great obstacle to chicory cultivation is the difficulty in eradicating the plant from the soil; it, in fact, becomes a regular weed, and requires to be dealt with accordingly.

HOW TO KEEP GATHERED FRUIT AND FLOWERS ALWAYS FRESH.—A friend has just informed us that fruit and flowers may be preserved from decay and fading, by immersing them in a solution of gum-arabic in water two or three times, waiting a sufficient time between each immersion to

allow the gum to dry. This process covers the surface of the fruit with a thin coating of the gum, which is entirely impervious to the air, and thus prevents the decay of the fruit, or the withering of the flower. Our friend has roses thus preserved which have all the beauty and fragrance of freshly-plucked ones, though they have been separated from the parent stem since June last. To insure success in experiments of this kind, it should be borne in mind that the whole surface must be completely covered; for if the air only gains entrance at a pin-hole, the labour will all be lost. In preserving specimens

of fruit, particular care should be taken to cover the stem, end and all, with the gum. A good way is to wind a thread of silk about the stem, and then sink it slowly in the solution, which should not be so strong as to leave a particle of the gum undissolved. The gum is so perfectly transparent, that you can with difficulty detect its presence, except by the touch. Here we have another simple method of fixing the fleeting beauty of nature, and surrounding ourselves ever with those objects which do most elevate the mind, refine the taste, and purify the heart.—*Country Gentleman.*

CULTIVATION OF FLAX IN YORKSHIRE.

On Tuesday, May 2nd, a large meeting was held in the Council Chamber of the Leeds Court-house, convened by the Leeds and Yorkshire Flax Society, "For the purpose of giving explanations to landlords, farmers, manufacturers, and others interested in the growth of flax, as to the present prospects of demand and remuneration, and the best methods of growing flax." The meeting was numerously attended, principally by agriculturists who were in search of information upon a matter to them of very considerable importance. Amongst the gentlemen present were John Wilkinson, Esq., Leeds; E. Lawson, Esq., Leeds; M. Milburn, Esq., Thirsk; B. Atkinson, Esq., Maunton-lodge; Henry Ludolf, Esq., Leeds; G. Metcalfe, sen., Esq., and G. Metcalfe, jun., Esq., Pateley Bridge; J. M. Barret, Esq., Leeds; Mr. Boyle, Mr. Patterson, Mr. Freeman, Mr. D. F. Bower, &c., &c.

JOHN WILKINSON, Esq., who was called to the chair, opened the proceedings by saying that the committee of the society had thought it highly desirable, at this particular time, to call the attention of farmers to the increased necessity for the cultivation of flax in this country. The present peculiar position of this country and Russia rendered it impracticable to receive more than a very small proportion indeed of the usual supply of flax from Russia, which had averaged 50,000 tons per annum. In addition there was an increasing demand for this raw material in England; and, before the prospect of war, it had been clear to him and most other flax spinners that the prices of flax—especially of the kind that might be grown in England—would range high. He really did not think that the price had been much increased by the war; but it would be high even if peace were declared on the morrow. They would continue to have such a demand that prices would be kept up to a remunerating rate, and he had no hesitation in expressing the belief that it would be highly to the interest of every farmer at the present moment, to put down every acre he could in flax. His reasons for this opinion he would briefly explain. High prices in the wheat market would stimulate increased production on both sides the Atlantic to such an extent that, if the next harvest in this country were an average one—of which there was every prospect at present—the price of wheat in England must be lower. But whether they had peace with Russia or not, the price of flax would be fully as high, if not higher than it has been during the last twelve months. Difficulties, he knew, existed in the growth of flax in this country, from the want of knowledge on the part of most farmers of the best mode of cultivation, and also from their not knowing how to make the straw into flax. But there were various plans in contemplation which led him to expect that a considerable portion of these difficulties would be removed, and he should not be surprised to see spinners and flax manufacturers in a position to pay a really good price for

the straw. Of course the less the distance the straw would have to be carried by the manufacturer, the better the price it would fetch; but he was of opinion that the straw would yet be found to sell at a good price, even if it had to be carried fifty or sixty miles. His own private opinion was that straw of a fair average quality would be worth from £4 to £5 per ton upon the spot where it was grown, if within fifty or sixty miles of Leeds. Then they all knew that linseed was highly favourable to feeding, as it possessed both feeding and fattening properties. The demand had been very large for linseed as well as for flax. Another fact worth consideration was, that the climate of England and Ireland is much more favourable to the growth of flax than that of Russia. The flax of Russia was the weakest in the world: that of England was the strongest—(Hear, hear);—and the flax of England was worth 60 to 70 per cent. more than Russia, whilst the grain of Russia was worth as much, or very nearly as much, as that grown in England. (Hear, hear.) He thought, therefore, the farmers of England, and of this district especially, might with every confidence extend the cultivation of flax, especially if they possessed the means or knowledge of converting the straw into flax. But in any case they might with perfect safety, within a reasonable distance of Leeds or Selby, grow it; for there would be such a demand for flax as they had never before experienced. (Hear, hear.) He had received two letters through Mr. Eddisson, the secretary of the society, from a gentleman named Scott, agent for the Irish estates of Thomas Sandars Cave, Esq., and whose opinion was of much value.

MR. MILBURN, at the request of the chairman, then read these letters, of which the following are the more interesting points:—

"Without well grounded confidence in the minds of the farmers, it would be useless to attempt the introduction of flax growing into new districts; but with *this* establishment, there will be little difficulty or danger of its failure. A short review of the leading features of the case, as they present themselves, may therefore be the best means of engendering this requisite confidence. A farmer may naturally ask what inducements can be held out to him to substitute flax for a portion of his wheat or other crops, all of which are paying him well at present; and the best answer to that inquiry will be to inform him that *two-thirds* of our foreign supply of flax, upwards of 50,000 tons, which we annually receive from Russia, is suddenly cut off, and this in conjunction with a rapidly increasing home consumption. An announcement, too, has just come from France that a prohibition has been placed upon the exportation of flax from that country, in order to favour the mills that are rising up and producing canvas, linen, and thread, in competition with the British and Irish manufacturer. Now, to give the farmers of this country a moderate idea of what the manufacturers may in future require from them over and above what they at present produce, I shall only take the supply from Russia alone, as being cut off,

and estimating it at 50,000 tons, which is less than the actual quantity imported, we should require to appropriate 230,000 acres to produce this quantity of fibre; and supposing the farmers of Yorkshire can be induced to set aside the quantity of land requisite to supply a considerable portion of this deficiency, the first thing they will require will be a local and convenient market for the flax straw in its green state. For want of such an outlet I know several localities in the West of England, where many tons of straw are now rotting in the rick-yards. In the county of Cork the Earl of Bandon, and other great landowners in the south of Ireland, have recently induced their tenants to grow flax to a considerable extent. But beyond an area of ten or fifteen miles around the seats of the *local markets which they have established*, I found on a late inspection that the cultivation ceases. I think a class of middle-men, exactly similar to our woolstaplers, are also required to buy between the growers and the spinners."—Mr. Scott next suggests that portions of land attached to selected Poor Law Unions may be set apart for the cultivation of flax in the best manner, for the instruction of the farmers of the district; that intelligent Ulster farmers may be introduced as tenants in selected districts; that monthly lectures, with specimens, may be given; and adds that in Ireland a great want exists of linseed oil mills. He then proceeds—"It is a remarkable fact that the greater portion of the seed produced in Ireland is still exported to Belgium for crushing, and is re-imported principally at Liverpool, in the shape of linseed oil and cake. Even in Ireland, it is generally believed that 100,000 acres of flax is still annually steeped with the seed on it, involving a loss of from two to three hundred thousand pounds; this evil, however, is gradually lessening. It is also being confirmed that the ripening of the seed does not injure the fibre to a perceptible degree; and if a moiety of it is consumed by the stock on the farm, the land is not likely to be impoverished or injured. It is, therefore, to be hoped that the seed will always be saved, and with so much *more care* than at present, as to be fit for re-sowing. Professor Low's opinion, which is entitled to great consideration, is, that the production of flax, whether pulled when in bloom, or allowed to ripen its seed, impoverishes a farm; and this opinion has probably had much to do in causing the abandonment of its cultivation in Scotland, and of inducing the introduction of prohibitory clauses into Scotch leases. He says—'Flax is an impoverisher of the farm, as the stems yield no return in manure, and its seeds only do when consumed on the farm. As in all cases it is to be regarded as an exhausting crop, and not as equivalent to a restorative one, its place in the rotation will be understood.' Notwithstanding this, I now find a prevalent opinion, well supported by experience, both in Ulster and other flax-growing districts in Ireland, that it is *not an exhausting crop*. I have taken some pains to note this circumstance on land where it has been regularly grown, and am inclined to favour the *new* opinion. It has also been ascertained that the *only* place in the rotation where flax can successfully come in, is not alone after pasture or clover ley, but that it can be most advantageously sown after wheat, on clean and well conditioned land; and I think this likely to be confirmed as its proper place. The moist climate of Ireland is admirably adapted for the growth of flax, it being a succulent plant; and hence we find that the lineas made from it surpass those of other countries. The soil also is generally suitable, and the produce averages per acre nearly five cwt. of fibre, worth at present upwards of £15, and twenty bushels of seed, worth not less than £3. The best soil to sow in is a hazel loam, and in all cases it is necessary that the subsoil be of a retentive nature, to protect the plant against droughts. The seed should always be sown on a *stale* furrow; and, if extra quality in the straw be aimed at, thick sowing is necessary; that is, about three and a half bushels per acre. As it is indispensable that the crop be thoroughly weeded, the land, after flax, is always left in a clean state. * * *

The encouragement of flax manufacture on the Continent has been the study of governments there for hundreds of years; but if we look at the decay of their great marts of exposition, as exemplified in the splendid 'Linen House' of Frankfort-on-the-Maine, and similar institutions, and compare these indications with the rise and present prosperity of its manufacture in this country, we may readily conclude that *here* must be the great workshop for flax spinning and weaving, from wherever the raw

material may come. And if the Yorkshire Society take the Belfast one for its model, and consider that since its formation in 1841, the acreage of flax grown in Ireland has increased from 80,000 to 175,495 acres, they may reasonably entertain sanguine hopes of the success of its operation. And where the farmer can command sufficient capital and labour, with mills for manufacturing the fibre and crushing the seed at his door, he cannot look at the results of its culture in Ireland and on the Continent without being convinced that no crop will pay him better, on an average of years, than a reasonable breadth of well-cultivated flax."

Mr. MILBURN thought the main difficulty at the present time with farmers would be the comparatively high price of corn. Two or three years ago agriculturists would have been much more disposed to engage in the cultivation of flax than they would be now. There were some few spirited men who grew flax, not for the purpose of obtaining the straw or flax, but for the sake of the seed. With reference to the alleged exhaustive quality of flax as a crop, the opinion was now gaining ground among all who understood farming operations, that the consumption of the seed by stock upon the land formed one of the best modes that strong-land farmers could adopt for improving their soils. Mr. Milburn then entered into an explanation of the method adopted by Mr. John Hutton, of Sowber-hill, of growing flax for the purpose of feeding his cattle upon the linseed; and said that whilst the cattle and horses were almost beyond anything he had ever seen elsewhere, the high state of cultivation of the entire farm was perfectly astonishing, and it was attributable entirely to the valuable manure made by the flax seed. Of this he was quite satisfied, that if the farmer, when he grew his flax, would give the cooked linseed to his cattle, it would not only be one of the most effective and cheapest feeding agents procurable, but the manure produced would be one of the most important improvers of the land that could be devised. His opinion was that landowners would not object to the cultivation of flax upon their estates, if the farmer would consume the seed; but it was the selling of both off the land that was objected to.

The CHAIRMAN said that an eminent chemist had shown that the seed of flax derived its nutriment from the soil, but the flax fibre was the combination of two gases derived from the atmosphere; consequently, if the seed were returned to the soil in the way suggested, no crop could be less exhaustive of the land than flax.

A FARMER said he had cultivated flax for twenty years, and always considered that it did less injury to the soil than almost any other crop.

Mr. BOYLE, after forty years' experience, was in a position to say that flax was not the exhaustive crop that many people supposed. He had now wheat growing upon soil which bore flax last year, and it was as fine and promising as any he had seen after fallow. In answer to a question, Mr. Boyle said that the time for sowing flax depended upon locality and soil. In Yorkshire the present time was not too late, especially as they had now been favoured with rain. It was always worth while to wait a time for rain, as the seed grew so much better.

Mr. ATKINSON also pointed out the importance of sowing flax when the soil is damp; and for that reason believed that flax sown last week would answer much better than flax sown three weeks before at a droughty time.

Mr. LUDOLF attached considerable importance to deep ploughing; and in regard to injury to the soil, stated that he had the authority of Mr. Robert Schofield, Sand Hall, near Howden, and Mr. Brailsford, Toft Grange, Lincolnshire—the former of whom grew from 70 to 120 acres per annum, the latter from 50 to 70 acres—that they never obtained better crops of wheat than they did after flax. He also recommended thick sowing—from two and a-half to three bushels per acre; and that the seed should be sown broad-cast instead of drilled, as the flax crop was more even in its growth, and consequently much better for retting.

Mr. E. LAWSON produced a sample of flax straw, purchased of Busfield Ferrand, Esq., and grown upon that gentleman's land, near Bingley. For this flax Mr. Lawson paid Mr. Ferrand £16 per acre.

Mr. BOYLE said that much of the value of the flax crop depended upon its management. For example, for the first flax

straw he purchased of Mr. Ferrand (for Mr. Lawson) he gave but 45s. per ton; but last year, so much better was the crop, that he actually gave him £16 per acre; and so satisfied was Mr. Ferrand, that he intended this year to sow eight acres of flax instead of six.

Mr. FREEMAN, a flax grower for forty years, directed attention to a recommendation which had been made that farmers should sow from three to three-and-a-half bushels per acre. He warned farmers against doing any thing of the sort; for to sow so much seed would prove a most serious thing for them. From six pecks to two bushels per acre was as much seed as should be sown; and if that quantity was exceeded, they would find their crops next to worthless. Another point to remember was, that not more than ten acres in the hundred should be sown with flax, or their crops would deteriorate.

Mr. BOYLE explained that the three-and-a-half bushels referred to the Irish acre, which was about equal to two bushels to the English acre. Two bushels of Riga seed per acre were sown by Mr. Ferrand.

Mr. D. F. BOWER wished to impress upon farmers that flax should be sown only moderately thick upon land which had had

nothing to excite it. Flax raised upon land manured with guano was scarcely worth having; and the flax was scarcely one-twentieth part of the straw. From one ton of flax straw raised upon land manured with guano he had only obtained 1 cwt. and a few odd pounds of flax.

Mr. LAWSON produced a sample of green flax scutched without retting, and said that it would be of much importance to many farmers to effect this, because there were objections raised in England to retteries, on account of their offensiveness.

The CHAIRMAN said that if it could be shown that green straw could be made into flax without retting, it would be a very great benefit to the farmer, and form a greater stimulus than anything else to the growth of flax. Which, he asked, would take the least straw to make a ton of flax—by this process or by retting?

Mr. LAWSON did not think there would be much difference. He added that he had a commission to give £5 per ton for flax straw such as he had shown, to go to Belfast.

The CHAIRMAN said that at that price, if the farmer grew two tons per acre, which was a fair crop, the value of the crop, including the linseed, would be something like £16 per acre.

Shortly after the meeting terminated.

CROYDON FARMERS' CLUB.

The annual dinner of this Club, held on Saturday, May 6, at the King's Arms Inn, was attended by about 40 gentlemen connected with agriculture; J. Page, Esq., of Merton, occupying the chair, and Edward Stenning, Esq., the vice-chair. Amongst others present were Captain Hawkins; J. W. Sutherland, J. Cressingham, J. J. Mechi, — Grove, — Bottomley, — Chasemore, T. L. Robinson, T. Farley, and Henry Richards, Esqrs.; Messrs. C. Pimm, R. W. Fuller, J. Wood (Secretary to the Club), Staveley, Childs, Hipwell, Griffin, Collyer, Sannels, Wm. Streeter, C. Churcher, J. Walters, G. Seal, Kennard, Wm. Dyer, W. Castledine, Mearns, Wilson, and Rattray, sen. and jun.

The CHAIRMAN, in the course of the evening, in proposing prosperity to the Club, as well as in returning thanks for his own health, said, some might not think farmers' clubs were much good. If it were so, there was only one cause to which it could be attributed, and the blame must be on the farmers. (A voice, "That's a fact.") They won't take the trouble to make themselves acquainted with the information they might obtain at the Club; and, although knowledge lay at their feet, they would scarcely take the trouble to stop and pick it up. He had heard farmers say they couldn't do this, and they couldn't do that; why did they not follow what a gentleman had told him, viz., that he had blotted out "can't" from his dictionary. He did think that, for the benefit of agriculture and the interest of the farmers in the district, it was desirable they should keep up a good farmers' club, so as to bind the farmers together. It was essential that they should use every means to make themselves acquainted with the best practices in farming, because, from its very nature, it took a whole life-time to become a good farmer. And why should they not obtain all the information they could, so that their children might reap the benefit of their improved system? For this object a farmers' club was a very useful thing. The Chairman then referred to the advantages which the Club had conferred on its members, and adverted to the best mode in which its funds could be applied. The farmers were now very anxious with regard to the use of artificial manures, and he would propose that an arrangement should be made so that every member who belonged to the Club should be able, at a very small cost, to have an analysis from a competent person, so that they should not have a lot of rubbish.

In proposing success to the London Farmers' Club, the Chairman remarked that the farmers of Surrey were not deficient in spirit, but they were much indebted to the London Farmers' Club. He had had the pleasure of going there, and been very well received. It was supposed that farmers were full of deep and rigid bigotries and obstinate prejudices, but such was an erroneous opinion. And he could assure Mr. Mechi that the improvements urged by the London Farmers' Club were not unappreciated; but that any good practical ideas which had originated there, would be taken up by the farmers of Surrey, who would endeavour to carry them out. But they laboured under a very sad lingering complaint—a disease had got into their breeches-pocket.

Mr. MECHE, who was called on to return thanks for the London Club, did so at some length. In the course of his observations he said:—With regard to the state of agriculture, let them only look at the condition and appearance of the crops this year. They had had a most delightful time; but what could they expect of a man if he had been subjected to hard living, wearing damp clothes, and sleeping in a hard bed; why he would soon get yellow: and that was just how the wheat plant was looking generally at that time—the crops were bilious; they could not keep the roots of the plant but for a very short time at the depth of only five inches, and when they penetrated through this thin agricultural pie crust, and got down below, then they were like the man in wet clothes and ill-fed; and then, instead of the inside of the pie being filled with good things, they found all the goodness laid in the crust, and the inside was only water instead of rich gravy and meat. Mr. Mechi then urged the importance of draining, and also of irrigation. Since he had been in Croydon he had been inspecting the mighty engine they used for supplying the town with water, and he found that it threw up 650,000 gallons of water to the reservoir, 150 feet higher than the engine, at the expense daily of 13s. 6d. for coals. Now if you get manure water high enough it will dispose of itself of course anywhere you want it by being conveyed in pipes for that purpose. He was now coming to the practical part of the question. There was sufficient population in the town of Croydon to effectually manure 3,500 acres round the town; and why, he would ask, did they not use it for a proper purpose? He did not know what they did with the sewage of the town, but there would

be sufficient if properly collected to do as he had stated "Oh!" but the farmers said, "where's the money to come from?" It had often been said to him that his best farm was in Leadenhall-street. Well, he would tell them how he had managed his farm there. When he first went to that establishment it was in the same condition as a great many estates were now in, viz., out of repair and wanted improving; but he had taken it at the state in which he had found it, and according to its value, and had laid out a great deal of money upon it; it had answered his purpose, and had paid him so well that he had taken another lease of it, but at a much higher rent, as he had to pay for the improvements he had made. He had now invested £2,000 more on his farm in Leadenhall-street, and he was satisfied it would answer his purpose. He had been to Scotland, and the Duke of Richmond had invited him to see his estates, where very great improvements had been made, and he had employed a vast number of people, to carry on which improvement he had borrowed £25,000 of the Government. Now, after such an example, let them not be afraid to follow it, and he advised them to borrow money for the same good purpose. With regard to his own outlay in farming he had often been laughed at, but he could afford to bear all that. His land when he took it was bad below and bad above. He had laid down about four miles and a half of fences, besides what he had done in other respects, and had yet to learn that it would not pay. He had been told that it was money foisted away; but he had called on three practical men to go over his land and value it, and land which had been only valued at 15s. an acre, those gentlemen had now valued at 36s. His friends around him might scratch their heads, but they could not deny it; and so it would be if they laid out money in any way for the improvement of their land. They must discontinue the higger-mugger way they had got

into, and they need not fear the result. The manufactures had so improved that it was said they could wrap the whole world in cotton, and he wished they could say they could grow enough to supply the inhabitants of this country with food. He thought there was not enough use made of the sewage of the town of Croydon with its 15,000 people. The Earl of Essex had told him that he took it of the town of Watford for £10 a year, and others had done the same in other towns. Now had they not plenty of land round Croydon that required all the sewage they could get? But they must drain their heavy lands first before they applied it, or it would act as a poison to the plant. On the light chalky land round Sutton, they might use it without draining, and be thankful for it. What he wanted was for the farmers to leave off the starvation principle of managing their land. They wanted to get the steam up; they wanted steam engines. Everybody had said at first, "What a fool that Mechi is," when he had erected a steam-engine; but thank God he had lived beyond all that sneering, and they might depend upon it the time would come when steam would be the principal auxiliary in assisting to do the work required by the farmers. He had seen an engine ploughing away at Lord Willoughby De Eresby's, which did the work very well; and by-and-bye it would be said by a coming generation, "What a set of old frumps our fathers were to go on in such a higger-mugger way; what a wonder they never had sense enough to find out these improvements before!" Now the sooner they got over all their old prejudices and old-fashioned ways of doing things he thought the better it would be for them.

A number of other toasts were given, and addresses delivered, all promising well for the prosperity and further advance of the club.

NEWCASTLE POULTRY SHOW.

The third annual exhibition of the Newcastle, Northumberland, and Durham Society for the Improvement of Domestic Poultry, was held on Wednesday and Thursday, April 19 and 20, in the Corn Exchange, Newcastle, and surpassed its predecessors in extent and in merit. The number of entries was no less than 287! Such a congregation of poultry was never before witnessed in Newcastle. The judges by whom the claims of the competitors were decided were the following:—

FOR POULTRY.

Rev. Robert Puelleine, Kirbywiske, Thirsk.

Mr. Thomas Reid, Newcastle-upon-Tyne.

FOR PIGEONS, EGGS, ETC.

Mr. Pape, jun., Newcastle-upon-Tyne.

Mr. England and Mr. Hall, Hexham.

Their duties were arduous, but they were so discharged that their decisions gave general satisfaction. The prizes varied in amount from 30s. to 5s., and exceeded in the aggregate £60.

The visitors were so numerous that on the first day alone upwards of £100 was received for admission in shillings. On the two days there were upwards of 3,000 visitors.

It will be observed that "cloth of frieze" and "cloth of gold" occasionally came into competition, and that "cloth of frieze" was not always worsted.

Among the eggs exhibited was one from a Spanish fowl, belonging to Mr. Fawcus, of Dunstan, near Aluwick, measuring 9½ inches by 7½, and weighing 6oz.

The Spanish, Hamburg, and other fowls, so far surpass in beauty the ugly Cochin Chinas, that fashion alone can give

the latter a superior claim in some eyes. But our good friend in Durham, the editor of the *Advertiser*, who, inspired by an enthusiasm which we admire more than we share, writes on the show as follows:—

"The Cochin China breed was the cause of the greatest competition, and, as usual, attracted the largest share of attention. There were no fewer than fifty-nine pens entered in the seven classes into which the breed was divided. When we mention that a large portion of the birds had been bred from the stocks of such celebrated breeders as Fairlie, Fletcher, Gilbert, Sparham, Collinson, and Capt. Snell, the best idea will be given of their beauty and high quality. In the first class there were thirteen competitors; and the prize, it will be seen, was carried off by H. Marshall, Esq., of this city. His birds were acknowledged by all having any pretence to a knowledge of such matters to be the finest specimens of the breed ever shown in the North of England. The cock, 'Sir Charles Napier,' weighs 14lbs., and was bred by Mr. Fairlie, of Newmarket; the hens weigh 11½lbs. and 12lbs. respectively. The pen was marked at £100! The birds exhibited by Charles F. Perkins, Esq., and to which the second prize was awarded, were universally admired. For beauty of plumage they were perhaps superior to Mr. Marshall's, but they did not possess that shortness of leg, fulness of breast, and squareness of body which characterized the winning birds. Mr. Perkins's pen was marked at £250! Those exhibited by Mr. R. Dewes, of Park-row, Knaresborough, worthily received the commendation of the judges."

SEWAGE MANURE--ADULTERATION OF GUANO.

It is scarcely fifteen years since guano was first recommended to the notice of the farmers of England as a substitute for farm-yard manure when they have it not, and as an auxiliary when they have. The recommendation was received with some amount of incredulity; but guano is now deeply rooted in agricultural practice. We import annually 150,000 tons, and nearly a million and a half sterling is expended every year on this foreign manure by English and Scottish farmers, whose management is much dependent on it. So says Mr. Pusey, in an article in the last number of the *Journal of the Royal Agricultural Society*, on Nitrate of Soda; in which he adds, that if any one imagines guano to belong only to amateur farming, he will find that in East Lothian the money expended on portable manures may be taken at 12s. to 18s. an acre on the whole cultivated land of the county; that £400 to £600 is a common yearly expenditure for guano on individual farms; and that the largest individual produce known there is on land in itself very inferior, resting on the worst of all subsoils—20s. an acre being paid to the landlord as rent, and 46s. an acre to the guano merchant. Mr. Pusey concludes that any prospect of the exhaustion of the supply is somewhat formidable; that we must look the difficulty in the face, and prepare for the emergency, not only by ransacking the globe for fresh deposits of guano, but by endeavouring to find some substitute for it. The substitute which Mr. Pusey would recommend is nitrate of soda, to supply nitrogen, adding superphosphate of lime, and perhaps a little potash, for those crops which require them. There are difficulties, however, to be overcome in obtaining this nitrate of soda in such quantities as we require. They arise from the nature of the country from which it is to be brought, and from its being, like guano, chiefly in the hands of the Peruvian Government, who appear more disposed to levy black-mail on British agriculture, than to promote its improvement by means of a cheap supply of manure.

We have a manure, however, at our own doors, of which we are wasting millions' worth annually. It contains nitrogen, phosphates, and alkaline salts, and every substance our crops require. It is wasted for no other reason than that our farmers think it impossible to use it in the only way in which it appears likely ever to be economically employed. If it can be precipitated and dried, carried about in ships and on railways, in a dry state, for them to dissolve it

in water, they will gladly avail themselves of it. If, on the other hand, an engineer tells them he will put up a steam-engine, and lay mains to convey the sullage of towns a distance of thirty miles; that he will lay pipes under their fields, and thus deliver to them their nitrates and phosphates in a liquid state, and in just that state of dilution which best suits their crops, so that by merely turning a stop-cock, they shall be able to manure their land at a cost of 30s. an acre, including manure, labour, interest on the capital sunk, and wear and tear of machinery—they as practical men will have little to do with anything so visionary. Local Boards of Health, therefore, are advertising fortenders for their sullage to be precipitated and deodorised. If a profit can be derived from the sale of it, well and good; but at all events it is a nuisance which they must get rid of; and provided that nuisance can be got rid of by precipitating and deodorising, that is all they require.

Deodorising, however, is one thing; and converting into an efficient dry manure economically is another. The sullage water may be rendered clear and inoffensive, while all the valuable manuring substances remain in solution, and are carried off to the ocean. This has long been the opinion of our best chemists, and it has been confirmed hitherto by the want of success which has attended attempts to produce a good manure from sewage water by the precipitating and deodorising process. The chemist is in favour of employing it in the liquid state, if the engineering difficulties can be overcome. The engineer says there are no difficulties if the capital is forthcoming. The capitalist it is said is satisfied the undertaking will be profitable, if the farmers will use the liquid manure when it shall be brought to them. He is moreover, if we are to believe all we hear, just as ready to advance money for this purpose as for draining, to be paid by a terminable rent-charge on the estate. All therefore that is required is to convince farmers that it will be advantageous to them to purchase this liquid manure, and to convince landowners that they may safely charge their estates in this way for the necessary outlay. And how shall we convince them but by testing the experiment? With guano, however, this was easily done; the farmer risked a pound or two in the purchase of a small quantity; he was satisfied with the result, and became from year to year a larger purchaser, till the guano and artificial manure trade reached its present magnitude. The experi-

ment with the sewage of towns, however, is more costly, and the farmer cannot fairly be called upon to make it. Under the most favourable circumstances, some thousands would be required to carry it out. Supposing land available close to the outfall of the main sewer of a town, there would be the cost of the steam-engine, and of the distributing-pipes, which must be laid under the land—the latter amounting to little less than £6 an acre. The public at large are, moreover, quite as much interested in the success of the experiment, as a sanitary question, as the farmer and the landowner are in its bearing on farming prospects. It should have been tried long ago, at the public expense. There should, years ago, have been a farm manured with sewage water, distributed in this way, so that all could go and see. At present we have several farms on which individual enterprise is distributing manure in the liquid state; but it is the manure of the farm reduced to the liquid state, not sewage water. What we want is a good experiment with sewage water on a farm of two or three hundred acres.

The Government, however, have now other work on their hands, with this Russian war. Let the experiment, then, be tried by means of a subscription amongst the agricultural body and sanitary reformers. Let some ten or twelve thousand pounds be thus raised. The Royal Agricultural Society would do well to give their attention to it; and if a committee were organised, it might not be difficult to raise the amount required. Let a farm be selected as near as possible to an outlet of a sewer, discharging the exuvæ of a population of three or four thousand. Let a steam-engine be erected, and pipes be laid under the land. Let part of this farm be manured exclusively with the sewage water, and let the solid manure produced on that portion be applied exclusively to the remainder. The committee might report the results from time to time, and invite the inspection of practical men. We have in our eye more than one locality favourably situated for the experiment. If a landowner could only be found with sufficient confidence in the result to charge his estate with the outlay for the distributing-pipes, the sum required to make the experiment would be reduced to the expense of the steam-engine, and the ordinary farming capital requisite for the given quantity of land.

One advantage which the farmer would derive from having the sewage of towns brought to him in the liquid, instead of in the solid state, would consist in exemption from the adulteration of the article by fraudulent dealers and manufacturers.

In an essay, in the ninth volume of the Royal Agricultural Society's Journal, on the present re-

lations of Agriculture to Chemistry and Geology, by Professor Johnston, there is so much in accordance with the views which we expressed last week on this subject, that we shall beg leave to draw the attention of our farming friends to this portion of the paper, by a few extracts, recommending the whole of it to their attentive consideration. "The possibility," says Professor Johnston, "of concentrating great fertilizing efficacy in a small bulk has been satisfactorily demonstrated to every one by the remarkable effects of guano. In watching the progress of this branch of science, and marking the obstacles which from time to time have stood in its way, it has appeared to me as if the finger of Providence might, by serious men, be recognized in the introduction of this foreign substance. More corn was wanted to feed the growing people, and more manure to raise it. More portable and more manageable forms of manure were also desired, that it might be applied more frequently than hitherto, at times hitherto unusual, and in places hitherto not easily accessible. How many years of unavailing labour must teachers of science have spent, before they could have satisfied the rural community that large bulks of manure were in many cases unnecessary, and that the success of their crops might be trusted to the fertilizing action of any mixtures they might recommend! But guano came, and, on the old principle that 'seeing is believing,' forced new ideas into the oldest heads, and a new belief into the minds of the least persuadable." "I will try some of it myself, next year," was the often unexpressed resolution of men convinced against their will, and the spirit of experimenting was widely awakened. Chemical analysis took it up, explained the composition of guano, declared that it could be imitated at a reasonable rate, and published experimental recipes for compounding artificial mixtures, to be tried against it. Immediately, half-instructed men—supposing the practical conclusions already arrived at, which more cautious men were only beginning to seek for—hurried into what appeared to them a sure and easy way of making money. Artificial guanos, and prepared manures, qualified to do everything, appeared in the market. The farmer, in many cases, as credulous now as he was unbelieving before, bought them with avidity; and that singular and ignorant transition state of things arose, by which the relations between the artificial manure maker and the manure consumer in this country are at present characterised. On the one hand, we have a body of men, the practical farmers of England, among whom there is a greater number, I believe, of zealous, enlightened, and open-hearted improvers than in any other country; on the other, a crowd of persons

with that superficial amount of the necessary knowledge, which in this country we call quackery, preparing manures for their use. We have numerous trials of their nostrums going on, numerous losses sustained by the farmer, which we never hear of, and year by year the maker taking means to add a little to his information, and if a failure in the demand admonish him, a little also to the real value of the article he manufactures. Of course, among the vast number who now follow this trade, there are some who are more skilful and trustworthy—some I know to be highly honourable men; but these rarer few use harder words regarding their brethren in trade than I am willing to do."

Professor Johnston then observes that this branch of business will, before long, become one of the most important in the country, and will afford scope enough for many honest men to make an honourable livelihood. He reprobates the unfair advantage which his experience in analyzing artificial manures, and investigating the mode of manufacture of many of them, has convinced him is at present taken of the inability of the farmer to test beforehand the value of the article which he purchases. He points out the numerous evils which arise out of the sale of fraudulent manures—under which name he includes ill-compounded mixtures, made after defective recipes—evils which are not confined to the mere loss which they entail on the unwary purchaser. This alone is a serious consideration; but the failures which attend them destroy the confidence of farmers in artificial manures, and science in general, retard the progress of improvement, keep down the produce of the land, and injure the honest and well-instructed manufacturer, who is confounded, in public opinion, with the knave and the quack.

He does not, however, altogether acquit the farmers of blame in the matter. They have encouraged adulteration, by too eager a pursuit of cheapness. The makers of manures have been obliged to consult this taste, and to sacrifice quality to lowness of price. Some, who are anxious to bring into the market an article deserving of confidence, have declared that they cannot afford to sell their pure manures at the price which the farmers will give. The competition of others prevents it, and they therefore confess that they are obliged to reduce them by some cheap admixture.

We learn that, for this purpose, the phosphatic

concretions of the Crag, which have received the name of coprolites, are calcined and ground, when they produce a beautiful yellow powder, which is used for mixing with guano. The mixture is not a bad one, if sold for what it really is, and at a fair price, since it imparts to the guano that in which it is often deficient; but the farmer is duped when this ingredient is sold to him at the price of guano. What is the remedy for this state of things? Professor Johnston points out one which we have often advocated. The extension of scientific education to the agricultural body—the diffusion among them of that limited amount of chemical knowledge which shall enable practical farmers to manufacture such mixtures for themselves; this must be the general remedy. There is another, more partial in its application, but available in all localities within thirty miles of a town having a certain amount of population, and having an elevation of not more than 150 feet above the outlets of its sewers: that is the distribution of the sewage, by means of the steam-engine, and an under-ground system of irrigation. By the use of town sullage in such localities, a vast amount of guano and other dry and portable manures would be set free for the use of localities out of the reach of such appliances by reason of distance or elevation. In this, however, as in the case of guano, believing must be brought about by seeing; and therefore we advocate the establishment, by the combination of zealous agricultural and sanitary improvers, of a few farms, in different parts of the country, manured on this system.

In the water drill we have made another step in advance. Guano prepared the way for artificial manures, compounded of those substances which chemistry has shown to be the constituents of plants afforded by the soil and by established manures. The water is preparing the way for the distribution of liquid manure by under-ground irrigation, by proving that light manures are best applied in the liquid form; and those farmers to whom the sullage of towns (which contains all those substances which we are traversing sea and earth to find) shall thus be rendered accessible, may have it, if they will, brought to them in that state of dilution best adapted for application, and unadulterated by those mixtures, to which it will be liable if dried and deodorized by manure makers, that, when it reaches them in the solid, they may again reduce it to the liquid form.—Mark Lane Express.

PRESENT PRICES—FUTURE PROSPECTS.

As this is a subject of the highest importance to every farmer at the present juncture, I hope those of my readers who honour my practical papers by a perusal will excuse me for departing a little from my usual course to say a few words, and but very few, upon the prices we are now receiving for our farm productions, and the prospects that seem to await us for the few months preceding harvest. I do not pretend to be more sagacious, or to have a greater knowledge of the subject, than other ordinary men of business; and in venturing thus openly to express my views, I have many misgivings lest I should lead my readers astray, and thus undo the very object at which I aim in my contributions to the *Mark Lane Express*—i. e., to aid in doing good to every cultivator of the soil. However, I can only beg them to take my remarks in passing for what they are worth, and no more.

Wheat.—Wheat, “the staff of life.” The present prices are high; and where the farmer was fortunate enough to secure a crop, the price is sufficiently remunerative. With the exception of a few months in the disastrous year 1847, prices have not been so high or so well sustained for many years—they are good prices. The future prospects: France, our great competitor during the past season in the world's markets for wheat, appears to have secured enough for her consumption, and symptoms even of an excess have been shown by partial reshipments to this country. Italy has been an importing country this season; imports and supplies have been good in Italy, and enough is procured. Belgium and Holland have both imported largely, and the markets in those countries are free from excitement, indicating enough. The United Kingdom would seem just now to be the only country decidedly open to considerable imports. What are, then, its prospects of supply, and to what extent? The home growers had a large stock of old, and they have undoubtedly now a fair stock of new on hand commensurate with this precise period of the season and its attendant circumstances of a narrow breadth and short crop for the year. Farmers for the most part are too much in the habit of selling merely when they want money, and they are not speculators at all; hence one conclusion is, that this want being supplied, a larger proportionate quantity is held by them than usual. We have had high prices for several months, which have led us to economise consumption; this has tended to bring out every stack of old wheat—to the adoption of various substitutes for wheat—to interest the whole world, as it were, to provide for the wants of the British people; our

merchants have ransacked all the warehouses in every part of the globe. Hence another conclusion is, that every supply that can by any possibility be brought to bear upon the market will be forthcoming if it is really required; and if it shall be found absolutely requisite, then Indian corn will be universally employed as a substitute. Again, the summer season is *in*; vegetables are growing apace, and will very soon occupy a large share in the everyday consumption of every family. Again, all holders of wheat are anxiously watching for any untoward circumstance that may temporarily enhance its value; all are timid, both buyer and seller are alike extremely cautious. Should supplies increase, prices must recede; should they continue steady, prices will become so. But it must be something very important and unforeseen that can cause any material advance in price. America is straining every nerve to send her supplies from all parts of her immense territory—from seaboard, to the far, far west. Her stock of wheat is not large; but of Indian corn unexampled. Egypt has opened her ports, and the accumulations of the past are ready for transport. The Baltic continues to send considerable quantities; and, although short stocks are spoken of, yet we must bear in mind that harvest is fast approaching, particularly in the South of Europe, and the probabilities are favourable for an early, extensive, and abundant harvest in this country. I incline strongly to urge a quiet, steady, regular, even course; no excitement, no crowding, no overstocking. Try and keep the supplies as near to the requirements as possible; if but once the market becomes glutted, it must fall rapidly, and there can scarcely be a rally prior to harvest. Never forget that the British market rules the whole corn-growing world.

Oats.—The price for oats has ruled high, and the tendency is still upward: the supplies are short and likely to continue so. The Russian ports being closed against us, no shipments will, of course, come from the North and White Seas, from whence large supplies usually come in the summer. Freights are high: oats do not offer so good a profit to shipowners as wheat, flour, or Indian corn or meal; this is against the prospect of large, or even moderate, supplies of oats being imported from America or other distant countries, and it appears that our continental countries have not many to spare. I conclude, therefore, that oats will keep their price, and possibly go still higher. The late rains have greatly improved the crops; but they are uneven in appearance, and the breadth sown is by no means large. The best

course is to keep selling: prices are very tempting to holders, however distant.

Barley.—The price of barley is relatively lower than for any other grain. The breadth sown last year was very large, and the crops good. The supply has at all times been adequate to the demand; and had not the price of wheat been raised to an unusual height, barley would have had a very slow and unsatisfactory sale. The supplies are still good, particularly from foreign ports. Barley cannot go higher prior to harvest, unless some unforeseen circumstance unfavourable to the growing crop is evidenced, of which at present there is no prospect: the breadth sown is certainly not equal to last year; and the sample, owing to the long drought, will most probably be uneven; hence maltsters may desire to enhance their stocks; but in face of propitious weather and fair prices, it would be folly to speculate to any extent in holding after the increased duty.

Beans and Peas.—Beans and peas for the most part yielded a poor return: the crop was wretchedly deficient, although the breadth sown was large. Prices have consequently been very high, which has caused much to be brought to market. The supplies have therefore latterly fallen off, but the price nevertheless has not advanced: the fact that these pulse crops are of more extended and general growth than oats, and, of course, more likely to come from all parts of the world, far and near, may tend to keep them down in price: be this as it may, the present

price is good, and no prudent man will refuse to take it. Beans are quoted from 42s. to 62s. per qr., while barley rules from 36s. to 43s. per qr. Peas are used for so many purposes: good boilers are quoted at 58s. per qr.; other sorts, 44s. to 47s. per qr. These are relatively very high prices, and should not be refused.

Seeds.—The present season has been a trying one to seed-growers. Turnip-seeds are thin. Rapeseed is a poor crop, and very short in the breadth sown. Mustardseed is very defective in plant, and I never knew less sown. Linseed is sown in considerable breadths, and likely to do well. Canaryseed: This has for the past few years been very unremunerative, and therefore not much sown: growers will act accordingly, in the disposal of these crops.

One word as to the future.—Farmers may for once depend upon having the corn trade for the next year very much in their own hands. There never was a time when the *world's stock of grain* was so nearly exhausted; and one great source of supply—Russia—is shut from us by the war. Why, then, should farmers hurry their next harvest stock to market? Prices must inevitably be good if they will only be reasonable and cautious: there can be no just cause of alarm. Let every farmer take time. Let the aim be to keep up a fair, steady, regular supply, and he may then rest assured he will receive a fair price throughout the year.

P. F.

PRACTICAL HINTS ABOUT POULTRY.

Whether the large-sized varieties of fowls which are "all the rage" now amongst fancy breeders and dealers are really preferable to the old-fashioned barnyard fowls, is a subject on which there are two opinions among those who have tried both. To say nothing of the enormous prices which they occasionally command, they weigh heavily in the market-scales, or fill a large platter on the dinner-table. But, on the other hand, they are great gormaudizers themselves, and are generally considered difficult to raise. Roosters should be changed as often as once in two years, if not annually; and pains should be taken, in replacing them, to procure strong, healthy, and perfect birds: the hen will lay better, and hatch more chickens. Only a small number of hens should be kept in one house, or together. We have known repeated instances in which keepers of poultry have become disgusted at their failure to lay, and have determined to kill them off. They have commenced reducing the number, which was perhaps forty or fifty, and, when they got down to half-a-dozen, were surprised to find every one of the hens laying, and the supply of eggs for the family better than the whole number furnished. As to profit, we doubt whether, if all their food be bought, the eggs and chickens produced by any breed, and sold at the regular market prices, for the table, will pay the expense of keeping; but it by no means follows from this, that hens are not a source of profit on a farm. They eat much which would otherwise be entirely lost and wasted; and a small patch of buckwheat, sown at a trifling cost, and left

on the ground where they can stroll over it and feed at their pleasure, will keep them as fat as butter. The main point is, the great value of the manure of poultry. The hen-roost is the place where most farmers should go for their guano. If obtained there, it will invariably prove of good quality. There need be no fear for those who get their guano from this source, that it will turn out to be spurious or inferior. We doubt whether even intelligent farmers would estimate at more than one-hundredth part of its amount the quantity of excellent manure which can be made in this way in the course of the year. The hen-roost, duck-roost, goose-roost, and turkey-roost should be supplied with several loads of peat, swamp muck, or loam, spread evenly over the surface of the floor, and on this there should be scattered a thin layer of sand or gravel. On rainy days, when the work can be done as well as not—and as often as practicable—this should be all shovelled over, and the manure thus mixed with the other ingredients. The compost soon becomes strong, when it can be removed, and a fresh supply of suitable material be thrown in. The house is kept sweet, clean, and healthy for the fowls; and if any farmer will adopt this plan, and practise it faithfully for five years, and keep an accurate account of the crops raised directly from the compost made with the poultry manure, and from the manure made by feeding those crops out in their turn, he will be amazed at the amount of cash which he will have realized, and at the permanent improvement of his farm.—*Londonderry Standard.*

AGRICULTURAL BIOGRAPHY.

(Continued from page 396.)

CCCCXXXII.—HOGG, 1830.

James Hogg, or the Ettrick shepherd of Scottish story, was born in the year 1772, in the parish of Ettrick, in the county of Selkirk, in the south of Scotland. His progenitors had been mountain shepherds in that pastoral country as far back as could be remembered; only his father, with some earnings, took a sheep farm, and being unfortunate, again became a shepherd, when our author was ushered into the world. He was the second of four sons, and was early sent to hired work, being only seven years old, and got the half-yearly wages of a ewe lamb and a pair of new shoes, in addition to victuals, for herding a few cows. He had learned to read the most simple English writing, and advanced to some knowledge of the Bible, to form the letters in cypher, and to make figures, with which he defiled many sheets of paper. His subsequent education was self-taught, after he was advanced to be the keeper of sheep. In this employment he advanced to manhood, and began to read books as he could get them, and attracted notice by an eagerness for newspapers, and such things as he could understand. In 1796 he began to write verses, having met a kind master for ten years, and who encouraged his propensity of information. So soon as he understood books, he began to write, and got the appellation of "Jamie the poeter" from the rosy nymphs who chanted his uncouth strains. He now heard of Burns, read his poems, and had his imagination fired to emulate his fame. In 1800 he published a song, the first production of his pen, and soon after a few poems. He was discovered by Sir Walter Scott, who was then collecting materials for his "Minstrelsy of the Border," to which Hogg contributed a number of old songs and ballads. The proceeds of his works which were collected and published brought him the sum of £300, with which he rented a sheep farm, on which he completely failed to live. He then passed years of busy authorship, and encountered the usual difficulties of that penurious mode of life. In 1814 he married, and retired to live on a farm given him "gratis" by the Duke of Buccleuch, which he managed so as to pay neither rent nor livelihood. His labours in poetry and in literary contributions continued till his death, in 1835.

The agricultural works of James Hogg are not of great value, but sufficient to place his name among the writers on that subject. The title of "Shepherd's Calendar" would betoken some prac-

tical work, but it is merely a collection of curious tales of the country in the life of the shepherd. The author relates that he got £86 for that celebrated work "Hogg on sheep," which is not found in the National Library, though all his other works are placed there. Our private notice has formerly had a book of this work; it is an octavo book of the medium size, and relates wholly to the care, management, and diseases of the mountain sheep of the black-faced breed, the only flocks which were known to Hogg, and on which he maintained the existing prejudices of his day. It never attained to any repute, and is entertaining only to one particular party and subject.

In the character of a poet and a man, James Hogg supported a very respectable character. He was much entertained by Sir Walter Scott, who imagined he had found in the Ettrick shepherd one equal, if not a superior, to Burns. Some of Hogg's works have been lauded for originality, imagination, and boldness, but are homely and coarse; his simplicity was not pure or elegant, nor his enthusiasm bold or rapid. In passionate ecstacy he was far below Burns, whose piercing pathos have enshrined his name in every bosom of Scotland, which can read his poetry and comprehend his provincial meaning. The field of description was exhausted, and many generations must elapse, and revolutions must occur in national manners, before a field is opened for the enterprize of a successor to Burns. He found the field nearly untouched, and left it bare and uninviting to any succeeding attempts.

As a guest at the table of Sir Walter Scott, in the hey-day of his convivial meetings, Hogg must have been a companion of no common amusement. A native of the mountains, his plaid was constantly worn, and his hands never were whitened from the mixture of tar and butter which was applied as a smearing over the bodies of the sheep. In this garb Scott always took care to place him at the tea-table between young ladies of the highest rank in the company, in order that he might exhibit his hands before them in handling the tea-cups, and in reaching the necessaries. After tea he would stretch himself on the finest sofas of chintz, to the amusement of Scott, and the amazement of the ladies. On such occasions, his address to the host and hostess was truly amusing: the former was at first Sir Walter, the Shirra (sheriff), then Scott, next Walter, and at last Wattie; and the latter was at first Lady Scott, and at last plain "Charlotte,"

which delighted beyond description the author of the novels, and great Wizard of the North. In Scott's house Hogg dined with Lord Byron, and thought his Lordship was "a Gainty English laddie" (lad), "and took his toddy" (whisky and warm water) "brawley." His conversation wholly confounded Byron. He saw nothing in London very engaging of notice but the "noble brutes" which, in the shape of horses, pull along the streets the heavy waggons of coals, and the drays of breweries: all other things were trifles.

In the private relations of social life, Hogg was kind, affectionate, and obliging; his integrity was steady and upright, and his principles were just and unflinching. His mind was strong and vigorous, and his passions were under a proper control. In that latter point he far exceeded Burns.

CCCCXXXIII.—BERRY, 1830.

Rev. Henry Berry was an extensive farmer in Worcestershire, and employed himself very much in rural matters. He was connected with the "British Farmer's Magazine," and wrote "Improved short-horns, and their pretensions stated; being an account of this celebrated breed of cattle derived from authentic sources, to which is added an inquiry as to their value for general purposes, placed in competition with the improved Herefords;" London, pamphlet, 8vo. In this essay the author displayed very much correct knowledge and sound judgment, even though engaged in a one-sided subject; the short-horned breed of cattle requires the best maintenance which the richest lands can afford, in order to be profitable, and are exceeded by the Herefords and Devons in the fore-quarters, in the covering of flesh, and lightness of offal.

CCCCXXXIV.—DAVEY, 1830.

John Davey, Esq., wrote "Observations on the disease which has lately been so destructive to sheep, called Bane or Coath, particularizing the causes, and minutely describing the modes of effecting its cure, and pointing out those means which ought to be adopted to prevent its recurrence;" Bath, pamphlet, 8vo. This treatise has never been noticed beyond the bare announcement.

CCCCXXXV.—SMITH, 1831.

James Smith was born at Glasgow, in 1789, in the middle station of society, his father being a very respectable merchant, and his mother of the family of Buchanan, in the western part of the county of Stirling, where a landed patrimony was held by them. He lost his father at an early age; but by the care of his maternal uncle, Mr. Buchanan, of Deanston cotton-works, near Doune, in Perthshire, a university education was afforded him, at which,

and at the private schools, his proficiency was very good. His leisure time was spent with his uncle, who had removed to Catrine Bank, in Ayrshire, where he farmed his own estate of land, and displayed as much spirit in agriculture as in the department of manufacture. The nephew very aptly followed his steps, and was initiated into his views of mechanics, and of close draining, which had occurred to his powerful mind on the tilly clay lands and very humid climate of the high part of the county of Ayr.

Mr. Buchanan must be awarded the merit of close drains being filled with rubbly materials, which he both suggested and practised most successfully; another instance of educated minds, of alien professions, being highly advantageous to agriculture, being clear of the dogmas, and not entrained in the net-work of the craft.

At the early age of eighteen years Mr. Smith was appointed manager of the Deanston works, that had become the property of a company, of which his uncle was a partner. His active energy had an ample scope in recovering a neglected and dilapidated establishment, and he very quickly collected and trained an almost unrivalled band of work-people, for whom he made a provision, both moral and physical, which showed a very peculiar benevolence of disposition. Sports and games in the hours of leisure, neatness of dress, and cleanliness of habits, education among the young, sobriety among the old, with a general system of religious and moral training, raised Mr. Smith's establishment into a model of employment, and a pattern of moral culture.

Being satisfied with the success of re-organizing the establishment at Deanston, Mr. Smith had leisure to look at farming, as he had not forgot the lessons of his uncle. His first production was a machine for reaping corn, which had many trials, and several pieces of plate as rewards, but never came into general use. He never gave up the idea that if the land was laid flat, all reaping would be done by machine. Mr. Smith displayed much ingenuity in many parts of machinery, and in useful contrivances connected with the cotton works of which he was manager.

The farm of land that was attached to the cotton works early attracted Mr. Smith's notice, and it was the kind of soil that allowed the benefit of the lessons he had received from Mr. Buchanan. This gentleman suggested drains of 18 inches deep, and 12 feet apart, and filled with stones broken to the size of road metal. On this plan the estate of Catrine Bank was drained, and succeeded to complete satisfaction. In 1823 Mr. Smith began to improve the farm of Deanston in 200 acres, which he thorough drained on the system of parallel

drains 16 to 20 feet apart, and 27 inches deep, which was most effectual. The subsoil was various, hard and compact, impervious to water, sandy clay, spouty, with boulder stones, and in many places producing abundance of rushes and water plants. Mr. Smith very judiciously treated all these soils in the same way; the parallel drains were directed through clay and sands without distinction, as the same drains would equally serve both purposes. The rising water in the sands would be intercepted by the drains which caught the water from the clay soils. During his subsequent life, Mr. Smith held the same rule of draining, which the writer of this biography had from his own lips shortly before his death; and he had seen no reason to alter the depth of drains in 2½ feet, the frequency to be 12 to 18 feet according to the tenacity of the clayey soil, and large widths of 20 to 40 feet only showed the necessity of putting a drain between the distance as soon as possible." And after all that has been spoken and written about draining, no better practice has yet appeared.

Much land on Deanston farm was very thin of alluvial soil, often not more than 4 inches deep, and the subsoil being mostly the sandstone debris. Mr. Smith conceived the idea of gradually deepening the upper soil by moving, but not turning up, the under stratum. Being moved, it would percolate water and air, and be gradually assimilated to the upper soil, and no damage would arise from its being turned up, and at once mixed with the cultivable stratum, as had often happened with noxious subsoils of iron salts. The gradual assimilation would destroy any natural bad quality, and Mr. Smith foresaw that a moving of the subsoil would very much facilitate the escape of water from the surface into the parallel drains. With these views he designed and constructed the well-known subsoil plough which bears his name, and the implement has rendered very good service in the cases of proper use.

Every practice that proceeded from Mr. Smith was a system of the most orderly kind, clear in the conception, well defined in the maturation, free in the execution, and liberally disseminated in the result. His system of draining and of general farming had got winged over the kingdom, and his society was much visited, and his counsel requested. After many years of this ardent and improving life, Mr. Smith left Deanston in 1842, and lived in London as a consulting engineer. In that capacity he acted as a Sanitary Commissioner, visited Ireland, and tried the regeneration of the island of Lewis under its wealthy proprietor. He threw out many very excellent ideas, which may probably yet be caught and realized. Mr. Smith died in May, 1850, at a friend's house in Ayrshire. He never married.

Some few papers which he read on draining and general improvements were all that Mr. Smith contributed to the cause of agriculture; but his example was precious. He had a strong innate feeling, a generous and well-regulated enthusiasm, and the conception of sound theories. His mind was ardent and liberal, but not at all radically destructive; his religion, his morality, and his general policy, all tended to the true point of social benevolence and moral development. He was a man among the multitude, and a fish among the minnows.

CCCCXXXVI.—BLACKER, 1834.

William Blacker wrote "Improvements to be made on small farms in Ireland by means of green crops, and feeding animals in the stalls. Some pamphlets on the currency, proposing the use of an inconvertible paper money."

Mr. Blacker was agent on the estates of the Earl of Gosford, in the county of Armagh, in Ireland, and proved a real benefactor to his employer and the tenantry, and the harbinger of much coming good to the cultivators of the soil in Ireland. The feeding of animals on green food in the stalls is most properly adapted to small farms, and where turnip soils prevail, the advantages of that system must be great. This benefit soon appeared in the vast alterations which resulted from Mr. Blacker's administration, which advanced money to the farmers on security of the crops, and in no case was any loss sustained. He took an active surveillance himself, and located teachers under him to show and exhort the system he had adopted. This was a true policy; and when regulated by the rent demanded, must regenerate any society that is so far advanced as to partake the benefits. Great good was done, and greater benefits must follow.

In our opinion, no writer on Ireland ever looked at the country in the true light except Mr. Blacker; the means that are wanted must be afforded, and the demands of rent must be moderate, in order to allow the gradual possession of capital in the hands of tenantry. When sufficient intelligence and capital have been gathered, "then," consolidate farms, grant leases, and erect suitable farm buildings. Till that day comes, grand performances in Ireland must be throwing pearls before swine. Mr. Blacker has left a name of very enviable reputation.

CCCCXXXVII.—WEBB, 1834.

James Webb, veterinary surgeon, Elgin, wrote "The farmer's guide; or a treatise on the management of breeding mares and cows, with a selection of simple and easy prescriptions for the diseases of horses and black cattle;" Elgin, 1834, 8vo. The work fills 224 pages, and though chiefly medical, it contains many very useful practical directions.

CCCCXXXVIII.—HILLYARD, 1836.

Clarke Hillyard, Esq., farmed his own property of land at Thorpelds, near Northampton. He was a fine character of the plain school, and shrewd and active, capable and discerning. He was a good cultivator of the soil, and excelled in the choice of animals. He was fond of well-informed company, and eager for knowledge. He wrote and dedicated to Prince Albert "Practical farming and grazing, with observations on the breeding and feeding of sheep and cattle, and tables for computing the weight of carcases. Remarks on the probable effects of railroads and steam navigation upon agriculture. The amended poor-laws, alteration of the tariff, the corn-laws, cultivation of waste land, rents, tithes, rural population of the country, &c., &c." The volume contains 352 octavo pages of most sound practical sense, with several very amusing anecdotes. The matters are very inconveniently mixed together; the author's ideas and the practices of establishment spring together, and form a curious incongruity. But the practical precepts are excellent, and the recommendations very just, except on the corn-laws, where the author, with many others, lost their horizon.

CCCCXXXIX.—WHITLEY, 1836.

Nicholas Whitley wrote "The application of geology to agriculture, and to the improvement and valuation of land, with the nature and properties of soils, and the principles of cultivation;" 8vo., price 7s. 6d. This work is not found in the National Library, nor the name of the author; the above statement is taken from a public advertisement.

CCCCXL.—BLACKLOCK, 1838.

Ambrose Blacklock, surgeon, Dumfries, wrote "Treatise on sheep and the wool trade;" London, 18mo. The contents treat only the black-faced breed of Scotland, which are a small portion of the family of sheep. The anatomy of the animal and diseases are well delineated.

CCCCXLI.—LINCHAN, 1838.

J. Linchan wrote "Drainage engineer and land improver;" 8vo., £1 4s., coloured. The London catalogue of books contains the above statement; the name is not found in any other place of notice.

CCCCXLII.—RHAM, 1838.

Rev. William Lewis Rham was born at Utrecht, in the Netherlands, in 1778, came early to England, studied medicine at Edinburgh, and eventually took his degree in divinity at Trinity College Cambridge. He was presented to the living of Winkfield, in Berkshire, where he died in 1843.

Mr. Rham throughout his whole life displayed an active and unremitting usefulness as a parochial

clergyman, being the true friend of the poor, both in present cases and prospectively. He instituted a school of industry, which became a model of similar institutions, and imparted knowledge to the rising generation in the plain way of the most beneficial utility. On this subject his name is well known, and will be long remembered.

Agriculture obtained from Mr. Rham an early attention, and his preparatory studies well qualified him for looking at the art in the most elevated position. He contributed many articles to periodical publications, as "Aftermath," "Plough," and "Yorkshire Agriculture," to the "Penny Cyclopædia," which are distinguished by the author's sound judgment and sober discrimination. He collected the scattered materials into a volume called "The Dictionary of the farm," in which his views are most neatly and temporarily expressed. He wrote "Flemish husbandry," a small work in the farmers' series of the "Library of Useful Knowledge." His "Essay on the analysis of soils" gained the prize offered by the Royal English Agricultural Society, and is published in the Journal, which contains some other valuable contributions from his pen.

Mr. Rham is the most sensible and judicious of all the scientific writers on the art of agriculture. He knew practice well, and revered it, notwithstanding all its dogmas; he received with caution and the most deliberate consideration the promulgations of chemistry, which had no other foundation than the fancy or the brain of the writer, who theorised in the closet, and experimented under a roof. He examined all sides of the question, and when asked, gave his opinion freely. He relied upon experience, in connection with a bold and searching investigation of theory, and has rendered his writings by that means by far the most acceptable of the present day. "Whatever," says he, "great chemists may say about the component parts of soils, I am persuaded they never can decide as to the aptitude of any soil to produce a crop till experience has shown it. I believe we have all overlooked some electro-magnetic qualities which we have not yet instruments to measure." In the eagerness of improvement, a writer is best calculated ultimately to benefit his country who unites scientific attainments of a high character with a rational degree of respect for the established practice of ages. "The Dictionary of the farm" should be in every farmer's bookcase.

CCCCXLIII.—VAUX, 1840.

Thomas Vaux wrote "Outlines of a new plan of tilling and fertilizing land;" London, 8vo., 1840. The work occupies 214 pages in a stitched volume. The author reasons very justly on the valuable improvements that may be done, and argues forcibly on the expediency of the execution; but he fails to

adduce any new modes that are more eligible than the already known means of proceeding.

CCCCXLIV.—COX, 1844.

George Cox wrote "Agricultural chemistry;" in 135 pages of small octavo size; London, 1844, price 2s. 6d. The author discusses aërial matters, salts, acids, &c., &c., but fails to establish any fact for practical adoption. This is the fault of all chemical essays.

CCCCXLV.—RICHARDSON, 1847.

H. D. Richardson was a native of Scotland, and lived in Dublin. He wrote "Dogs, their origin and varieties, directions as to their general management, and simple instructions as to their treatment under disease;" Dublin, 1847, 12mo. "Domestic fowl, their natural history, breeding, rearing, and general management;" Dublin, 1847, 12mo. "The hive and the honey bee, with plain directions for obtaining a considerable income from this branch of rural economy; to which is added an account of the diseases of bees, and their remedies;" Dublin, 1847, 12mo. "The pests of the farm, with instructions for their extirpation; a manual of directions for the destruction of vermin;" Dublin, 1847, 12mo. "Pigs, their origin, varieties, and management, with a view to profit and management under disease; also plain directions relative to curing;" Dublin, 1847, 12mo. "Horses, their varieties, breeding, and management, in health and disease;" Dublin, 1848, 12mo.

These small volumes are known as Richardson's handbooks, and since his decease have been continued by the publisher, who employs different writers on the special subjects. They contain a condensation of very sound matter, placed in a very neat order, well exemplified and illustrated and at a very convenient price. It is a very useful arrangement to have each subject of the art separately discussed, and forming a treatise by itself. The matter is generally better arranged, and more lucidly treated than when placed in the body of a large volume of general compass.

CCCCXLVI.—YOUATT, 1847.

W. Youatt spent a most useful and laborious professional life of upwards of thirty years in adorning the veterinary art, of which he was a very distinguished professor. He was a native of Devonshire, and obtained the notice of the leading members of the Society for the Diffusion of Useful Knowledge, and also of the London University College, where he was employed to deliver professional lectures, but which were not followed up. He also lectured privately to young students, and entered into several designs and partnerships in order to promote the art. He edited the "Veterinarian"

Journal, and wrote in it a number of highly valuable papers, which have been published.

Under the superintendance of the Society for the Diffusion of Useful Knowledge, Mr. Youatt wrote "The Horse—its breeds, management, and treatment;" Svo., London, 1834. "Cattle—their breeds, management, and diseases;" Svo., London, 1834. "Sheep—its breeds, management, and diseases, with the Mountain Shepherd's Manual;" Svo., London, 1837. He edited the last edition of the "Complete Grazier," than which no more useful work has ever appeared. In 1842, he wrote "The Dog;" Svo., London; and in 1847, "The Pig—a treatise on the breeds, management, and medical treatment of swine, with instructions for curing hams and bacon." This work was not finished when the author died, and was a posthumous production. In 1839, Mr. Youatt published a most feeling and benevolent work, "The obligation and extent of humanity to brutes;" 12mo., London—an honour to his head and his heart.

The works of Mr. Youatt have always been very deservedly esteemed, as containing a varied and entertaining knowledge in a very large amount of the different subjects that were treated. If the methodical arrangement be deficient and the matter prolix and lengthened, the tiresomeness is relieved by the great variety of statement and of illustration. The information had been most extensively collected, and is very appropriately used. Our own opinion reckons "The Pig" as the best of Mr. Youatt's works, and that no equal treatise has yet appeared on that subject. The work "On Cattle" is very useful.

Mr. Youatt showed himself to be an indefatigable tradesman—mild and unassuming. The special purpose is always kept in view, and no useless digressions are attempted. The lengthy treatment of some points may be objectionable, but the general value is always sustained and makes compensation. The death of the author in 1847 was much lamented, not only by the professional fraternity, but by every member of society to whom he was known. His character was universal in all circumstances of professional and general department.

CCCCXLVII.—GISBORNE, 1848.

Thos. Gisborne, Esq., of Yoxall Lodge, Staffordshire, wrote "Essays on Agriculture." I. Cattle and sheep. II. Agricultural Drainage. III. Ancient Agricultural Literature. IV. High Farming. These essays appeared first in the *Quarterly Review*, from which they were reprinted, and now form a volume with the title of "Essays on Agriculture."

These essays are very creditable, and show the author to have taken much more than an amateur

view of the subjects, and to have gathered a knowledge very far beyond the station of life which he occupied. He advocates deep draining on all soils, and fixes four feet as the minimum depth, which may have arisen from the comparatively porous soils he had got to deal with.

He uses very minute philosophical reasoning, and illustrates draining of land by observing the absorption of water by the sponge on a shaving table; but such nicety does not detract much from the substantial merits. The subjects are well understood and very sensibly discussed.

THE BREEDS AND CROSSES OF SHEEP BEST ADAPTED FOR IRELAND.

At a recent meeting of the Royal Agricultural Improvement Society of Ireland, Mr. F. Hamilton read a paper on the above subject, from which our space will only allow us to take the following remarks more immediately bearing upon the point under consideration:—

“Nothing can exceed the profit to be derived from the Leicesters, in favourable localities, or under careful and skilful management; and, therefore, they must hold the first position, as they have always done, and will be found invariably to do, by those who will give themselves the trouble of paying proper attention to them. Next to these I would place the cross between the Leicester and Ballinasloe sheep as being superior to any other breed but the Leicesters themselves, for the sound pastures of this country, and far superior to the pure-bred Leicester where but little attention has been paid to forcing the young sheep into an early market. Of the early origin of these sheep we know but little. The old sheep of the west of Ireland were distinguished by big heads, long necks, slack behind the shoulders, inclined to a narrow chest, and flat sides, with a deep belly, the inside fat of which, and the time it took to place it there, made them more of a butcher's than a grazier's sheep. On the introduction of Bakewell's sheep, and their far-spread fame, the Leicester tup found his way to the West; and to Mr. Dexter (the first importer of Leicesters) we are indebted for the breed of sheep to which he at first gave his name, and which are now the pride of the far-famed fair in the Park of Garbally. The breed of sheep in Connaught were thus wonderfully improved; the quantity of the old wool being considerably increased by the cross, and the quality of the Leicester wool improved by both the soil and climate. These sheep have continually, since then, been crossed with the Leicester blood; and although many flocks are still to be found bearing too many of the characteristics of former days to place them as being second in value to the Leicesters, still requiring a further and judicious crossing with the pure breed, yet, on the whole, the Ballinasloe sheep are not to be surpassed for the good sound pastures where high farming is not carried on, and that the owner can afford to keep them until they are twenty months or two years old, or even more. But it must be borne in mind that it is only under these circumstances that they are to be preferred, and that the more they are crossed with the Leicesters the more profitable will they become for this system. They have obtained a fleece, owing to the change of locality, of a closer texture and of a finer fibre of wool, which is not only highly valued by the merchant, but serves to

protect the animal from the cold and vicissitudes of exposed situations and a damp climate; and for this purpose nature changes the fleece of the imported Leicesters. But although the change takes from it the beautiful appearance of the Leicester fleece in the favourable localities of England, and the staple which catches the eye of the English judge in the wool grown in districts where

‘The food of wool
Is grass or herbage soft, that ever blooms
In temperate air in the delicious downs
Of Albion, on the banks of all her streams,’

yet we have no reason to believe that the change the climate effects in the appearance of the wool has made a fleece of less value to the wool-buyer than that which we admire so much on the back of the imported sheep on the large farms of the West, where the object is to raise a number of sheep, to dispose of again to the Leinster grazier or turnip-feeder, and where very large flocks are kept for this purpose, with comparatively little provision for the winter, the rent of the land moderate, and the dry limestone pasture favourable for the outlying of sheep. As I have before said, no breed can surpass these. But in crossing them care should be taken to follow long-established rules, and to avoid great disparity in size between the parents; and where increased size is required in the flock, and the fattening propensities are to be retained, we must go cautiously to work, and take ‘*Festina lente*’ as our motto; and in choosing our sires take care we run into no extreme, lest we may find it may be ‘the more haste the worst speed,’ and always observing that it is to the female we must look for size. An occasional recourse to the Cotswold breed will be of great use to infuse some hardier blood into the flock, and to fit them to the system they are intended for, and to retain the size that may be wished for. But great care must still be taken that there may not be too great a disparity between the ewe and the tup, as no error can be more fatal to the breeder than attempting to make a ewe produce a lamb she is unable to contain or to support. The Leicester then, *first*, and the crosses of the Leicester with the Ballinasloe *second*, are the only breeds that should ever put their foot on land capable of supporting them to advantage. The pure-bred Cotswold never would be very profitable in our country, their appetites being far too good, and their propensities to fatten too slow in proportion. They are well suited to the system of farming carried on in Gloucestershire, which is eating off turnips to manure for a barley crop, to which the

farmer looks for his payment; and the turnips are grown on the soil on which they have eaten off a stolen crop of vetches, with the addition of a little super-phosphate of lime, so that it is to the manure they look more than to the early maturity of the sheep. Next to the two first breeds I would place the South Down, or rather the Shropshire Down, which is by far the best of this breed: these latter seem to be much run upon now in England, and the specimens that were exhibited at the late cattle-show at Gloucester excited universal admiration; they carry with them, to all appearance, many of the perfections of the Leicesters. Their symmetry is very perfect, and they are said to possess a greater proportion of lean meat than any other sheep. But until their flesh sells in the market at a much higher price than it has even yet done, and that the Leicester and other long-woolled mutton falls much lower in proportion, it could never pay to keep them in good land *except when folding was required*, and for this purpose I believe they are superior to any other sheep; as, if the object be to manure the land and look to the barley crop as the chief profit, and that in this way the farmer can afford to keep on his sheep for a longer period without suffering a greater loss by it than this manure is able to repay them, the South Down are the best sheep he can have. Should the breeder have made up his mind that his farm was unsuited to the production of the two first breeds, and that folding was requisite to his land, and that in this way a flock of South Downs was desirable, I should advise him to get the best ewes he can procure of the Shropshire Downs, and annually import the best tups, and keep up a breed of his own; but never attempt to import the rejected ewes of an English flock in a crowded vessel, perhaps where many of them contract the seeds of disease, the progress of which is hurried on by the change from the dry and genial downs they are accustomed to, to the rank pastures and variable climate of this country. This is a system which must invariably lead to grievous disappointment. Mr. Hillyard, the president of the Northamptonshire Farming Society, in his work on 'Practical Farming,' says, 'I do not like to hear my Smithfield salesman saying he can make 1d. per lb. more of blackfaced widders (meaning South Downs) than he can of my white-faced ones'; but if Leicester sheep consume a less quantity of food than the South Downs to come to the same weight, then Leicester mutton can be afforded to be sold at a lower price than South Down, supposing their consumption of food to be equal. Let us see the value of the widders of each breed. The Leicesters are fat, and large enough for market at eighteen months old; but the great part of the South Down are not at so early an age, say twenty-two months old, for their comparative value. The average weight of the former will be about 11 stones of 8lbs., which, at 6d. per lb., is £2 4s. The weight of the latter kept in the same manner will be about 9 stones, which, at 7d. per lb., is £2 2s.; besides which, the Leicester fleece is at all times more valuable than the South Down. In making this statement I do not mean to depreciate the value of the South Down breed, as I am fully convinced that on large arable farms, where folding is necessary,

there is no breed of sheep will produce a greater profit to the occupier. The Cheviot ranks fourth in value; but it never can be profitable to breed these sheep unless the object is to raise a flock which are capable of thriving where others would starve. The hardihood of the Cheviot, and the propensity to fatten of their cross with the Leicester, render them very valuable for arable farms, where there is mountain or moory land sufficiently dry for a summer's run. We have much land unstocked in Ireland, particularly in the mountains of the far west, where Cheviots would not only exist, but thrive and pay; and if a little care was taken to raise cabbages and turnips at the foot of the mountains for their winter keep, and sheds erected for shelter in snow-storms and at lambing time, they could be turned to much profit; and then, when they were naturalized to the climate, and properly wintered, we should hear of less losses in districts where they may have been tried than we do at present. But it is only on lands incapable of producing a superior breed that they could be profitably kept, although their cross with the Leicester are, no doubt, thrifty and good sheep to purchase for fattening purposes, from those who have been induced, from the peculiar situation of their farms, to raise them; but they must be bought in, as they frequently may be, at a price that would never pay a very high rent for the breeder, or they will be purchased too dear, and consequently never could be profitably fed on any but very inferior land, where no better sheep could be kept. In naming these four varieties, I think I have mentioned all that are at all worthy of notice for this country. The Lincolnshire, the Teeswater, the Romney Marsh, and many other varieties, have all had their various advocates and admirers, and all possess their several excellences for their different localities; but I can see no reason why we should prefer any of them to our own native and improved breeds. The good class of sheep to be met with at Ballinasloe Fair, and in the various localities where they are bred, is a better sheep than any of these, and a better sheep to breed from than any other variety but the Leicesters themselves. The immense popularity of the Merino sheep at one time in England appears strange; as valuable as their wool may be, it never could be an equivalent for their deficiencies in other respects. I had an opportunity, about three months ago, of seeing a flock of these sheep that are kept on one of the Government model farms in France, at Montreuil, near the Vernon station on the Boulogne branch of the Paris line. The average price obtained for their fleeces, I was informed, was 20 francs, or a little more than 15s.; but their carcasses were miserable, and the very antipodes to anything like perfection, although I saw them under what might be supposed to be very favourable circumstances, a flock of 260 sheep only being kept on 400 acres almost entirely devoted to their support, eleven pair of horses being employed in producing food for them, as well as in eating off their own heads. They would require to have more than one fleece in the year at 15s. to pay for their keep.

Mr. BALL, who followed Mr. Hamilton, said, ever since attending the Gloucester show, I have seen so many grounds on which the Shropshire Down sheep

would be suited to this country, that I think before long the breed will be found not only extending itself in England, where it is at present in a comparatively confined district, but will also be a most valuable addition to the breeds of sheep in this country. In discussing the breeds of sheep adapted to the Irish climate and soil, I think they should not be overlooked. On the occasion to which I have alluded, I happened to fall in with some breeders of Shropshire Downs, who asked me what sheep we bred in Ireland. I said we had a very useful description of long-woolled sheep, usually denominated Ballinasloe sheep, which are more or less crossed with Leicesters; and, with a considerable admixture of Leicester blood, are found to answer very well upon superior lands. The observation they made was, that it was strange that we should run so entirely on long-woolled sheep; that they had had a class of sheep in their district which, in their wool, were equal if not superior to ours, and which brought at fifteen or up to eighteen months old a return of 48s., 50s., and even 56s. That was mentioned to me as the ordinary return in that district for the produce obtained from the breeding of Shropshire Downs. I was not aware that Mr. Hamilton mentioned that breed of sheep.

Mr. HAMILTON.—I alluded to Southdowns, and more particularly to Shropshire Downs.

Mr. BALL.—I don't know whether you hazarded any speculation as to the breeding of the Shropshire Downs.

Mr. HAMILTON.—No. I know nothing about this breed.

Mr. BALL.—I believe, as in the case of shorthorns, so the Shropshire Downs have now become a distinct breed, although it is evident that they are descended from an admixture of the Cotswold and Southdown blood. They are bred as a distinct breed in Gloucestershire and the west of England, and produced some of the best animals which were at the Gloucester show, as you may understand when I tell you that so high as £10 and £15 were obtained for Shropshire Down hogget ewes.

Mr. HAMILTON.—I am aware that at a sale in England, hogget rams of this class brought an enormous price, so high as 100 guineas.

Mr. BALL.—I think the closeness of the wool recommends them to Irish farmers. I have been told by sheep breeders in the west of Ireland, "We like our sheep very much on account of their early maturity, but we are afraid of the wool—we don't like such open wool in our wet climate—we are afraid the sheep's back will be wet in winter." That is an objection, to a certain extent, to what is undoubtedly an inferior class of wool—Leicester wool; and the consequence is, that we often see in Ireland sheep, in other respects good, but which are not looked after in England on account of their skins, but culled out of the flock, sought after in Ballinasloe fair, while sheep with a superior fleece of prime Leicester wool are refused. That is another reason why the Shropshire Downs, which very much resemble some of our West of Ireland flocks, as well as South-

downs, in the closeness of their wool, are a most desirable class.

Mr. HARKNESS, who addressed his remarks more especially to the character of the Cheviots, said: Our friend, Mr. Hamilton, has not, perhaps, brought up the Cheviots to the standard at which they are entitled to be estimated. Within the last 15 years, perhaps, no breed of sheep has improved more than the Cheviots. It is, as has been described, an animal of great hardihood, having a close wool, and able to stand severe weather; and Mr. Hamilton might have added that the Cheviot is, probably, the best nurse in existence—in this respect far superior to the Leicester. I have a memorandum here, which was sent to me by a friend, and which shows the progress of improvement in this class in a single locality in Scotland. I do not refer to it merely for the purpose of proving what the Cheviot breed may be brought to, but more particularly to show how, by careful and judicious management, all stocks may be improved. No man ever improved any kind of stock without great observation and careful watching of the different qualities of the animals, males and females, noticing the great variety of success which attends the production of their offspring, and trying to supply the defects he sees in one by the excellencies which he finds in another, in the male. Such is the case with the Cheviots in Scotland. This memorandum gives the progressive weight of the Lockerby Cheviots from the year 1839. I need scarcely say that Lockerby is known to be famous for its development of turnips and culture; but it is not merely to these crops that gentlemen there have paid attention, for they are equally successful with regard to sheep. Mr. Harkness, in illustration of the marked improvement which good management have brought the Cheviot, half-bred, or cross sheep to within the last 15 years, read the following report of weights of hoggets shown at the Lockerby Farming Society:—

"In 1839, the average weight of six half-bred (Cheviot ewe and Leicester), taken out of the premium lot, was 115½lbs. In 1840, the average weight of the two best and two worst of the premium lot of that year, was 139½lbs.

	HALF-BRED.	PURE CHEVIOT.
1841 ..	130 9-10ths	.. "
1842 ..	128 1-5th	.. "
1843 ..	128 3-4ths	.. "
1844 ..	142	.. "
1845 ..	175	.. 115
1846 ..	167 2-5ths	.. 122 7-10ths
1847 ..	157	.. 109
1848 ..	170	.. 116
1849 ..	165 3-10ths	.. 104 1-4th
1850 ..	164	.. 106 4-5ths
1851 ..	147	.. 111 7-20ths
1852 ..	155	.. 123
1853 ..	146 3-10ths	.. 116 1-5th
1854 ..	165 ½	.. 121 7-10ths."

DISCUSSIONS CONNECTED WITH AGRICULTURAL PURSUITS.

We are not generally inclined to attach the first importance to the merely numerical strength of an agricultural meeting. Compared with other classes, the attendance of the farmer is made at some considerable sacrifice to himself. The townsman, the tradesman or professional man, will step from his shop or office to the public room, move his resolution, or give in his vote, and be back again to his business in the course of an hour or so. The tiller of the soil, necessarily isolated in his position, leaves home with a far greater call upon his time and means. To him the hour or two, even in this railway age, comes to be seriously multiplied; and hence it often happens that, with his heart in the cause, he cannot give by his presence that support he is still so anxious to afford.

If his best wishes are with us, let us show that we are not unmindful of him. Let our first care be to let him know what is going on, and supply as well as may be that information he so much requires, but which it may have been denied him to receive in person. It would be impossible to estimate the advantage conferred upon the agricultural interest by the timely publication of proceedings and discussions connected in any way with the pursuit. The value, indeed, of many of our institutions mainly depends upon this branch of their duties. With numbers present sufficient to give a character to the meeting, and a practical knowledge to keep the subject under consideration within due bounds, the great effect is that which has yet to come. From an audience of some thirty or forty, the lecture or the opening paper goes forth to be canvassed by hundreds and thousands, as much interested, and as willing to appreciate what is said, as even those whose sympathies were enlisted at the meeting.

We should wish to register this as a rule without an exception. There are certainly but very few. The full and immediate reports given by the agricultural press of the discussions at the London Farmers' Club have long distinguished these meetings as the great feature of that Society. The good in them thus spreads at once from the thirty or forty more active members who have been enabled to get up. The same effect, though of course in a minor degree, attends the gatherings of the local clubs: their best points are sure to become well circulated. It is not, however, the clubs alone which thus address the whole agricultural community. The Irish Improvement Society is becoming famous for its

monthly meetings, and the reports it publishes of the appropriate topics there considered: indeed, a want of space alone prevents us giving, this week, a very excellent paper lately read on the best kinds of sheep adapted for that part of the United Kingdom. But we do not stop even here. It was but a fortnight since that we were enabled to draw up a programme (since officially adopted) of a series of meetings, confined chiefly to lectures, which were to take place under the auspices of, and for the especial benefit of, the members of the Royal Agricultural Society of England.

The first of these lectures was delivered at the house of the Society on Wednesday last. The subject of it was peculiarly appropriate, while it was as becomingly treated—"On the Progress made in the Manufacture of Artificial Manures," by Professor Way. At a time when the supply of artificial manure is the great difficulty of the farmer, we may easily imagine the interest with which this lecture will be looked to. The farmer has been almost led to depend on such a man as Professor Way for advice and assistance, and we must honestly admit that he did much for them on Wednesday last. There was not a substance or refuse available but of which he gave an estimate—the rate at which it might be obtained, and its real value when brought into use. If guano be an impossibility, what can be used as a substitute? Often as this question is now asked, to whom should we so naturally look for a reply as to the chymist of the Royal Agricultural Society?

And yet, no doubt, for the reasons we have already given, this lecture can scarcely be said to have been well attended by the farmers themselves. Beyond a few *habitués*, it was more a gathering of owners and occupiers—country gentlemen, whose other duties in town at this season render a call in Hanover-square a matter of no great trouble or inconvenience. These, however, it is only fair to say, were nearly all tried friends to, and with a real interest in, the cause. Such men as the Earl of Essex, Lord Berners, and Lord Camoys, Sir J. Johnstone, Sir John Shelley, and Mr. Raymond Barker, are something above the rank of mere amateurs. With them we may associate a few scientific men, and a few more working agriculturists. As for others, they, of course, will go to the report for that benefit which, as members, they are to derive from the proceedings.

It cannot be expected that we should attempt to give, even if we were *allowed* to do so, our re-

collections of a lecture that, necessarily involving some technical matter in its exposition, called for especial accuracy in its report. It was, in fact, just one of those addresses that, to be serviceable, should be fully and almost literally followed out. It comes, too, at a period, we must repeat, particularly well timed; and so we cannot do better than at once refer our readers to this report—whenever it may happen to appear. Professor Way himself alluded to a previous lecture of his on this subject, delivered we are afraid to say how long since, and the report of which he believed would appear in a future number of the society's *Journal*. The some four or five thousand members who did not happen to be present on Wednesday have only to show a little more patience, and no doubt in turn they will have this too.

This mistake, we believe—and we cannot but consider it a very grave one—rests altogether with the Council of the Society. By following out the plan they are now pursuing, we can only assure them that they will materially affect the real value of the course of lectures they have authorized. As for the mere summary they now sanction, we think

there are few but who will agree with us as to the comparatively little service of such a synopsis on such an occasion. There are times, no doubt, when, as at other places, a little compression in detailing the proceedings of the Society is not only discreet, but necessary. This, however, we do not take to be one of them. Professor Way's lecture was especially adapted to the period at which it was given. Its value should have insured it a full report, its appropriateness an immediate publication.

Professor Simonds is announced for Wednesday next, on the ages of animals as deduced from the teeth. Now, suppose instead of this subject the learned Professor had addressed himself to the rabies in dogs, on which he has, if we recollect aright, lately favoured the Society with some communications. At best, we could but expect the report of such a lecture—"BEWARE OF MAD DOGS"—in the Christmas number of the *Journal*. There is a highly commendable practice in many of our schools of pinching boys for stale news: let the Members of Council go well clothed.—Mark Lane Express.

THE GRAZING DEPARTMENT OF THE FARM—MEAT AND WOOL.

Our contribution at page 519, embraces the farming department of an agricultural business; we shall here make a few observations upon the grazing department of the farm—meat and wool.

MEAT.—Amongst the many permanent improvements in agriculture which have taken place within the past fifty or sixty years, none deserves a more prominent place, or is of greater importance, than the production of meat: it has fully kept pace, if it has not exceeded, the production of grain. We fear not to assert that, taken separately, more *grain* or more *meat* is now produced by the agriculturists of this kingdom than was formerly produced by taking both collectively. The introduction of improved courses of husbandry has done very much to effect this, but the attention that has latterly been called forth to the adoption of every practicable improvement of which the business of a farmer is capable of sustaining, has done much more. The growth of new varieties of grain and of roots and vegetables has done immense good; these, assisted by improved culture and artificial manurings, have wrought astonishing alterations and great increase of produce on every intelligent man's farm; but we think these have been exceeded by the improvement made in the breeding, feeding, and management of the live stock of the farm. Contrast, for a moment, the cattle of sixty years since—the long, high, thin, lean-

fleshed, large-boned, hard, unthrifty animals of that day, with the compact rotundity of shape, the soft, the mellow, thrifty animals of the present day; the former fed at six and seven years, the latter generally fatted the third year, often earlier. The same remark will apply to sheep and pigs, and not less to poultry; early maturity and quickness in fattening have been looked to as the deciding characteristics in every variety of meat-producing animal. In keeping with the improvements that have arisen, and the wonderful accession made to our supplies of animal food, has been the alteration in the taste and habits of the community. The whole British people have become large meat consumers, so that consumption of animal food has gone on progressively with its increase, and now bids fair to outstrip it; and not only has this taste for animal food become general, but it has assumed a new shape or feature. Beef, mutton, bacon, are looked upon as too common dishes. Lamb, veal, small pork joints, and poultry must now be served up at every table: hence the amazing demand for lamb, calves, small porkers, and poultry; and this will go on and increase, as the habits of the people are becoming daily more refined, and perhaps it is not saying too much to add, more luxurious.

Beef.—The supplies of beef have been, so far, well kept up, and at a moderate price: this has led to a very large consumption. The wages of the

working population have for the past five or six years been good, and have enabled the workmen to spend a considerable proportion thereof in meat. Beef, on account of the size of joints, was generally considered beyond a poor man's means; it has not been so latterly, but has entered largely into the daily consumption of very many working men's families. The consumption of beef has become almost universal in such families, and of course, under such a general demand, the price has greatly advanced; for, be it observed, the supplies have not materially fallen off—the advance is owing to the vastly extended demand. This, again, has led to unusual efforts to supply the demand, and the consequence has been the fattening of vast numbers of animals of each kind before they have arrived at a fair state of maturity. Breeding has endeavoured to keep pace with feeding, but as the prices for the past two years have tempted to such unusual courses of fattening management, it has not been able to do so; and the undoubted fact now is, that the stock of fattening animals is scarce, and more particularly that of cattle. A year or two previous to this time, many breeders declined breeding, and the rearing of calves became so worthless that many were given away, the general price of a good calf being about 15s. each. We are now feeling the effect of this suspension in the usual routine of business. We were in great alarm (a very short time ago comparatively) that foreign supplies of cattle would exert such a powerful influence upon our markets as to render grazing in this country a worthless business. This has passed away, and it is worthy of our serious notice, that notwithstanding railroads are available into the interior of our continental countries, that the supplies are on the decline. *And so it will be.* The continental workmen are not eschewers of animal food, except from stern necessity: high prices induce higher wages; higher wages bring in more comforts, better food, better clothing; hence, the population of other countries will consume more of their own meat, and have less to spare for us. Without saying more on this point, I will only adduce the state of all our spring markets. Everywhere the supply of young steers has been remarkably small, and all those animals in any way applicable for fattening have been so appropriated; but the graziers have universally found that, do what they would, they could not find fattening animals in sufficient numbers to enable them to stock their best pasture lands in a satisfactory manner, and have had recourse to store animals to supply their place. I infer, then, that the price of beef must be high for some considerable time to come; no animal ought, therefore, to be sent to market in a "half-meated" state. Give plenty of time; it is best for producer and con-

sumer. The better the animal is fed, the better the price. Beef cannot recede much in price.

Mutton.—The supply of sheep has been proportionately greater than that of cattle, chiefly owing to the dry and healthy season through which we have passed. The losses have been comparatively few, and the flocks have come out in far better condition than usual; numbers of the young sheep (hoggets) are now being shorn and sent to the fat markets, where they find a better price than given by graziers. Consumers, preferring such young and delicate mutton, give for it a very high price; this, however, deducts from the great weight of mutton annually required as food, and consequently adds to the scarcity. I need not repeat that what I have said above applies to mutton as well as beef. The enhanced consumption of the past five or six years has more than kept pace with the breeding and feeding of animal food; and although the numbers of sheep brought to market have been considerable, yet the demand has been fully equal, and they have been taken up, many I think, to supply the place of others fed off early in the spring and out of due course. The weight of mutton finding its way to market will be much less than usual, although the numbers of sheep may be equal to the past year, of which, however, I have many doubts. The price cannot be low, unless something very unforeseen occurs in the political world, causing a general stagnation of business.

Pigs.—The supply of pigs is of all kinds of stock the readiest to be replenished; but such has been the high price of "pig-food"—*i. e.*, bran, pollard, and the like—that very many have curtailed the breeding of pigs; and, for the summer months at least, the price of pork will run high.

Poultry.—The supplies of poultry are much on the increase, and the attention paid to the breeding and rearing cannot be too highly commended. This attention will be amply rewarded, as the supply forms a very pleasing and acceptable addition to our annual requirements, but the actual weight of food which it will supply will not by any means be an adequate help to our other deficits.

Wool.—The singular feature in the wool market is that light short wools, are nearly standing at the same price with heavy, long wools. This has much influenced the price of short-wooled sheep. The attention paid to the "diggins" may possibly cause a short supply of Australian wools next year, and the war will probably call for more inquiry to be made after the long and other corresponding wools. In conclusion, I will only observe that there is no apparent reason for any decline in British wools. The supply is short, and I think the fleece will be light, although superior to last year. P. F.

THE MALT-TAX.

"Farmers"—said Sir Bulwer Lytton in his admirable address on Monday night—"Farmers, like all other Englishmen, will readily submit to taxes, however onerous, provided you can convince them that they are fair; but I ask you whether any farmer can, upon any principle, look upon this Malt-tax as a fair one? You force on him free-trade, by which you concede that he has been a sufferer; you refuse to retrace your steps by a single import duty; and when he asks you for free-trade for himself, to enable him to cultivate that crop which he prefers, you not only refuse his request, but add fifty per cent. to the tax upon the only article in which he conceives that free-trade would be desirable to him."

It would be impossible to imagine any more inconsistent or impolitic step than that the Chancellor of the Exchequer has now determined on taking. In his first attempt to grapple with a difficulty, he has, as he must have too well known, revived the long dormant opposition of one of the most important classes in the state. He has done this, too, by an act as "flagrant" as it is altogether ill-considered. With scarcely the show of a reason, in defiance of every principle to which he stands committed, he puts it simply as a matter of necessity. We are engaged in an expensive war—money must of course be found to carry it on—and the landed interest must, above all others, provide this. Never mind whether you are unfairly and overburthened already; do not stay to consider whether we are going to revolutionize a system, and make you either way the sufferer. It is a question only for your loyalty and character as Englishmen. You would not see the British flag disgraced. You would not wish to find us tardy—however some others might—in taking up a cause in which we feel the honour of the country is concerned. Of course you would not. The English yeoman has long been proverbial for his sterling patriotism; and it is to him and his that we must look. The craven who would submit us to any disgrace so long as he only saved his money, shall save it; while the man we know we may depend on, shall pay for himself and the other too—with the further satisfaction of being abused for doing so.

Notwithstanding the majority in favour of this further imposition on agricultural produce, the debate which preceded it went all one way. Never was the argument with which every consistent man opposed the proposition met with so impotent or hollow an answer. The supporters of the

Government, indeed, appeared chiefly to rely on the exercise of those tactics by which the House of Commons is occasionally distinguished—if not disgraced. Unseemly interruption, a systematic plan of indecorous behaviour, hootings, and coarse derision, were the weapons with which one party of gentlemen received the reasoning of another. It is not too much to say that Her Majesty's Ministers offered scarcely one word in defence of that act of injustice they have committed. They taunted those only who least of all deserved such a charge, with being loath to support the honour of the country. If there has been any reluctance here—if any want of courage or decision has led us into a struggle that might otherwise have been avoided, who is it that should bear the blame? The Country party, the Manchester school, or the Government? The Country party of course: they shall bear the blame and the expense too. Every feeling of justice and right declares too clearly that they should.

Happily, however, this Malt-tax, run it up as high as you please, is one of those inflictions that in reality does injury to no one. To be sure, as the *Times* says, there are a number of "old fallacies" urged against it, that are scarcely worth considering. "However, here they all are," in the words of our contemporary, "numbered for use! No. 1. The Malt-tax, contrary to Free-trade; No. 2. The Malt-tax, a tax of twenty shillings an acre on land; No. 3. The Malt-tax a poor man's tax; No. 4. The Malt-tax, a tax on agricultural labour, and the raw material of scientific husbandry; No. 5. The Malt-tax an immoral tax; No. 6. The Malt-tax, a tax on the free cultivation of the land." And how do we find these half-a-dozen objections proved to be fallacies? In good faith, easily enough. They are fallacies *because* they are arguments which have been used before! They are points raised against this duty years ago, and that have been found so substantially correct as to be urged quite as strongly even now. The reply given by the *Times* is worthy of that offered in the House. From all the ridicule and far-fetched simile, we gather only this, that the opposition to the Malt Tax must be "a fallacy," because it is made on much the same grounds it was some sessions since. Picture Mr. Cobden or Mr. Villiers, in the days of the free-trade agitation, going home convinced his object was "a fallacy," because he had told the same story about it every day of his life!

We will take the case as it is offered to us, and beg distinctly to demur to the fallacy of any

one of those six points selected. No. 1: If the malt-tax is not contrary to every principle of free trade, we are really at a loss to understand the meaning of that term. Let us be content, however, with a free-trader's interpretation of it. We find, then, on Monday night, that Mr. Pollard Urquhart supported the amendment as "*an honest free-trader*," and anxious that no class should be burdened more heavily than others. He thought it extremely unfair that the additional taxation which was required should be placed on that class which had suffered more from the introduction of free trade than any other. *He thought he might even go so far as to call it a breach of Parliamentary faith.*" We think he might. As to No. 2, if a tax on the produce of the land is not a tax upon the land, we should be glad to know what is. By the third we learn that a tax on malt is a poor man's tax; that is to say, it taxes heavily the only beverage which, as a working man, he has to depend on. The first part of No. 4 comes to much the same thing, while it also urges this is a tax on the raw material of scientific husbandry. We have the recorded experience of scientific husbandmen to assure us that it is. No. 5 declares it an immoral tax, forcing the consumer into the worst haunts and sorest temptations for that limited allowance he is able to procure. Ask the magistrate, or the clergyman, as to how far the action of the malt duty improves the morality of a district! By No. 6, the last and greatest of these fallacies, the malt tax is denounced as a tax on the free cultivation of the land; that is, when the cultivator of the land

hesitates to use his produce but in one certain way, the malt duty declares that he shall pay heavily—far too heavily for him to attempt to use it in another. Again we ask, if this *is not* a tax on free cultivation, pray what is?

And these are fallacies so ably urged on Monday last, and upon the strength of which a Government proceeds not to modify, but to increase a burden! This may not be a farmer's question, but it strikes us very forcibly that it is, and one by which he should specially test his friends. He will find there were many still true to him on Monday night. He will find, again, there were quite as many who shirked the division. It is for him to bear this in mind, and ask, when the time arrives, how it so happened? Suddenly as the attack came, we are glad to see that many parts of the country are fully alive to the monstrous injury about to be inflicted on them. The first and most important point for their consideration is this—are they properly represented? Are the country members doing their duty to their constituents? We believe there are too many who are not. The remedy here, once more, is in the hands of the farmers themselves. As for the course of conduct adopted by the Government in this matter, we may say very conscientiously with Colonel Gilpin, that "the only principle upon which they appear to have acted has been that of putting their much-talked-of principles in their pockets, and extracting all the money they can out of the pockets of the landed and agricultural interests."—*Mark Lane Express.*

GREEN CROPS PLOUGHED INTO THE GROUND FOR MANURE.

The ploughing down, and covering in the land, of the crops of green juicy plants to act as manure, was a practice of the ancient Romans, and is yet followed in Italy and other parts of Europe. This mode of fertilizing land suits warm countries, where vegetation is very luxuriant and rapid; in our colder latitude, where culmiferous productions and root plants are more the object of cultivation, the utility of the practice has not yet appeared. The plants used for that purpose are of the leguminous kinds—tares, vetches, clovers, peas, buckwheat, and spurry; and in Italy the harvest is early, and the crop is removed in time sufficient to allow the maturity of the green plants. Our climate does not allow such successions, and a crop of any kind must be unprofitable that yields in return only what it has extracted, and leaves the land as before in point of fertility. In order to apply the practice profitably, a very full crop must be supposed, and

land that will produce a full crop of these substances will yield crops of another kind and of more value. On poor lands a scanty crop will be expected, which will be of little service for that purpose, and almost invariably fills the land with weeds. Rape is reckoned a very efficient plant for the purpose, as it is oily and mucilaginous. Sorrel has been recommended to be cultivated, and ploughed down with lime, in order to produce a chemical combination; but few soils will yield sorrel in abundance, and the chemical result may be too uncertain to justify the process.

The decomposition of vegetable matter below or in the soil has been put forth in favour of this practice, as producing a soluble matter, and also mould by continued decomposition. The gradual decay of substances above or below the ground is certain; the fermentation of those that may be useful in promoting the growth of vegetables, is a

very different question. Fermentation is a sensible internal motion of the constituent particles of a fluid, moist, or mixed compound body, by which they are removed from their present situation and combination, are again joined together in a new or different order and arrangement, forming new compounds with very different qualities from the original body or substance. It results from the combined action of air, heat, and moisture; and the first agent is oxygen, afforded either by the atmosphere, or by the decomposition of the included water. Oxygen gas being absorbed, and caloric separated during the process, carbonic acid is one of the results, and fermentation is the natural process for reducing vegetables to a simple state of combination. The first change is the vinous or saccharine fermentation, the conversion of the insipid matter of stems and reeds into a saccharine substance, in which process the presence of water and of saccharine are indispensable, and some other things must be added. The gramineous and herbaceous plants are generally stored with saccharine, and the acetous fermentation follows, which is succeeded by the putrid or the last stage of the process. This last stage is always certain, though the regular gradation of the others may be interrupted. During putrefaction, vegetables emit ammonia, phosphoretted hydrogen gas, and constantly carbonic acid gas, and hydrogen gas impregnated with unknown vegetable matters. The colour changes to dark brown, it swells, and becomes heated and is reduced to an earthy mass. The constituents enter into new combinations; the hydrogen unites with the oxygen, and is either volatilized in water, or separated in a gaseous form, and carries with it a portion of carbon. A part of this principle unites with the azote in those plants that contain it; a part remains in the putrid mass, giving it odour and colour. A portion of the carbon remains in the magma, and a part unites with the hydrogen, and a part with the oxygen, forming, with the latter, carbonic acid. The brown mass or earthy residue contains the primitive earths, metals, oils, and salts, which are found in vegetables, forms vegetable mould, and constitutes the principal means by which the earth receives back the principles it loses by the support it affords to vegetable life. In this process, air, heat, and moisture, are indispensable, and a quantity of the substances laid together. Green or dry vegetables ploughed into the land will lie in too small a quantity to generate heat; air and moisture will be nearly excluded, and no active fermentation will happen to afford acriform matters in the soil, and may be daily seen in the case of stubble and other dry substances. The conversion to mould by a gradual decay, is undeniable; but activity for present benefit

is wanting, unless an incipient fermentation has been effected before the application to break the texture by a disintegration of the fibrous structure. It may very justly be reckoned a wasteful practice to apply for manure any substances that can be used as food for animals, and thus effect a double purpose; the second crops of clover and tares have been ploughed under for manure, and in that case the first crops may be cut early to allow the second growth to attain a bulk of plants for the intended purpose.

If any of these succulent plants be raised as a manure for wheat, the bastard fallowing will dissipate the enriching matter; and if it be covered with the last furrow, the land must be in an unrough state, and it can only be reckoned a catch-crop. The only plausible case of application, is on places that have failed to receive the due portion of farm-yard dung; but the season being occupied in bringing forward a crop for the benefit of the land as dung, wholly excludes any effectual working of the soil; and in any case, such unmanured lands may be partly wrought and sown with crops, that will afford food to animals and also the land, by the subsequent application of the excrementitious matter. The use of green crops as manures would not fail to constitute very foul farming, and though a successful isolated case may occur, an extension of the practice will not be expected. The green crops may be harrowed and rolled before ploughing, which will render a convenience of being covered, and a compost of lime and earth has been added, which will aid the covering in the ground, and tend to promote putrefaction. It may be supposed that in the countries where the practice is said to be so very beneficial, the soils may be more loose and friable, the vegetation more rapid and luxuriant, and the plants more juicy and succulent and consequently more tender and easier of decomposition than in our own country; and that a variety of circumstances may combine in rendering the practice very useful in some countries, and inapplicable in others. The plants may be ploughed under when in full blossom, and if possible, in moist warm weather; and the latter circumstance may constitute an advantage in favour of the custom in the warm countries where it prevails. J. D.

TO RAISE GIANT ASPARAGUS.—A writer in one of the early volumes of the *Horticulturist*, (Mr. Downing, we believe,) tells how to grow common asparagus, so that it will always rival any giant production. He says:—Every one who has seen my beds has begged me for the seed, thinking it a new sort; but I have pointed to the *manure heap* (the farmer's best bank), and told them that the secret all lay there. The seed was only such as might be had in every garden. About the first of November, as soon as the frost has well blackened

the asparagus tops, I take a scythe, and mow all close down to the surface of the bed; let it lie a day or two, then set fire to the heap of stalks; burn it to ashes, and spread the ashes over the surface of the bed. I then go to my barn-yard; I take a load of clean, fresh stable manure, and add thereto half a bushel of hen-dung, turning over and mixing the whole together throughout. This makes a pretty powerful compost. I apply one such load to every twenty feet in length of my asparagus beds, which are six feet wide. With a strong three-pronged *spud* or fork, I dig this dressing under. The whole is now left for the winter. In the spring, as early as possible, I turn the top of the bed over lightly once more. Now, as the asparagus grows naturally on the side of the ocean, and loves salt

water, I give it an annual supply of its favourite condiment. I cover the surface of the bed about a quarter of an inch thick with fine packing salt; it is not too much. As the spring rains come down, it gradually dissolves. Not a weed will appear during the whole season. Everything else, pig-weed, chick-weed, purslane, all refuse to grow on the top of my briny asparagus beds. But it would do your eyes good to see the strong, stout, tender stalks of the vegetable itself, pushing through the surface early in the season. I do not at all stretch a point, when I say that they are often as large round as my hoe handle, and as tender and succulent as any I ever tasted. The same round of treatment is given to my bed every year.

FOOD FOR THE MILLION.— RYE AND WHEAT.

Wheaten and rye flour are everywhere each used much after the same manner. In composition and nutritive quality they very much resemble one another, as will be seen from the following tabular analysis of bread, quoted from "The Chemistry of Common Life."

	Wheaten bread.	Rye bread.
Starch	46 $\frac{1}{4}$	46 1-6th
Gluten	5 $\frac{3}{4}$	5 1-3rd
Water	48	48 $\frac{1}{2}$
	100	100

In colour and flavour, however, they differ widely; the latter being darker and sweeter to the taste, proving the two to be medicinally different. "Rye," says Dr. Hooper, "is, more than any other grain, strongly disposed to acescency; hence it is liable to ferment in the stomach, and to produce purging, which people on first using it commonly experience." Rye bread retains its freshness longer than wheaten bread, and is largely used in the north of Europe—in some cases leavened, but in others not. Unleavened cakes of rye flour are, in many instances, only baked once or twice in the year, resembling in appearance oil-cake, and forming the daily bread of the peasantry. In the olden time, it was used to some extent in this country, and, when mixed with wheaten flour, termed *mestlin*; but the quantity now used is inconsiderable.

Whether progress in the manufacture of other flours or mixtures may render them superior to wheaten flour, is a question which futurity alone can decide; but according to the present state of science, the latter as yet obviously makes the best bread, and is also superior for many other purposes in cookery. It is, however, deficient of gluten to support properly a hard working man, unaccompanied with animal food, or vegetables containing a large proportion of nitrogenous matter, such as butcher-meat, fish, cheese, milk, eggs, or pea and bean flour, cabbage, onions, &c. A ploughman, for example, would not be so fit for his work, on wheaten meal and milk, as on oatmeal and milk. We have tried the experiment; and if you take away the milk, the position of the hardworking labourer will be still worse. Before he could perform the same quantity of work, as he now does with a proper supply of butchermeat, when fed on

wheaten bread alone, he would become "pot-bellied," like the potato-fed Irishman, or rice-fed Hindoo, from the larger quantity he would require to consume, in order to supply the necessary amount of gluten, to keep in repair the muscular system. It is also defective of fat, to lubricate bones and muscles; so that part of the starch of the flour has to be manufactured into fat for this purpose, imposing upon the system not only an increase of labour in doing so, but also in disposing of residuary matter, thus endangering health, or at least rendering it more subject to disease; hence the reason why so much butter, suet, or lard is used in the cooking of wheaten flour, puddings, &c., or else eggs, the latter making up both for fat and gluten; bread and butter, for instance, at breakfast, suet at dinner, or fat meat; toast and butter to tea, &c. &c.

Many of the poorer children in our villages, who are fed almost entirely on bread, illustrate in a very forcible manner the soundness of the conclusion that wheaten flour of itself is improper food, especially in comparison with the oatmeal-and-milk-fed children of the north, for the red lips and rosy cheeks of the latter indicate an abundance of healthy blood, while the pale and sickly countenances of the former prove the reverse. The breakfast of the southern is too frequently nothing more than sloppy tea or coffee, with bread, and it may be a little butter—the buttered knife just drawn across the bread, to clean it as it were! Supper is a repetition of the same. Dinner may be the bread and butter, with perhaps a little treacle; or it may be a pudding made of flour, with a little suet or dripping. If the proportion of the latter is small, or wanting altogether, a slice of the pudding, the dinner of each child, may have a little treacle thinly spread over it, to be all the grateful heart of the happy urchin can desire. And this is probably the daily food of the majority of the children of our hard-working people!—food which, chemically speaking, is almost destitute of the elements of bone and muscle, and which solves the question why English labourers are less bony and muscular than Scotch.

Recent analytical experiments have shown that the outside of the grains of wheat contains more gluten and fat than the interior, and hence that the brown loaf is

more nourishing than the white. They also show the advantage of science to practice, and the error into which the latter has fallen in attempting to refine wheat flour by the separation of boxings, sharps, and bran from the fine flour. Our forefathers, for instance, in the days of the hand-quern, made better flour than we, with all our mechanical advantages. Guided by a false eye and vitiated taste, we have gone on deteriorating the quality of the flour instead of improving it—conclusions susceptible of easy proof; for it will be seen from a tabular statement formerly given, that fine flour contains only 10 per cent. of gluten and 2 per cent. of fat, while the bran contains 18 and 6 per cent. respectively of those elements, which proportional quantities are so essential to the value of food, being nearly twice the quantity of gluten, and three times the amount of fat. Again, milk has been taken as the type of food. Now, dried milk contains 35 per cent. of nitrogenous matter, 24 of fat, 37 starch, and 4 mineral substance; while dried wheaten flour only contains 12 nitrogenous, 2½ fat, 83½ starch, and 2 mineral. Hence the deficiency.

We have gone equally far astray in the cooking of wheaten flour after it is manufactured, as the plain batter-pudding, for instance, of the ploughman proves; for the more valuable portion of the wheat is given to horses or other live stock, and the remainder—or fine flour, as it is falsely called—made into a pudding by boiling it “an hour and a half” (quoting from a cookery-book), tied up in a cloth or basin! Now, can anything be more absurd than such a practice, whether we view it as a chemical or culinary question, or as one of economy? For under the first, the two would have made a much more valuable and nourishing diet had they been mixed together: if, after the miller had separated the ground wheat into fine flour, boxings, sharps, and bran, the whole had been mixed together, then they would have made a better pudding than the fine flour by itself. Under the second, the batter is not boiled, but steamed in its own juice or liquid in which it is made, and seldom or ever steamed equally throughout, the interior being very rarely properly done; for if cut in two, it will be found not of uniform consistency, the particles of flour on the outside being more swollen and better done than those of the interior, presenting something of the appearance of a transverse section of some trees. Had the wheat been ground into meal, and cooked after the manner of oatmeal, or made into what is termed “wheatmeal porridge,” the pudding would have been much better boiled in five minutes after the whole of the meal was put into the boiling water, as described in making oatmeal pudding, than by steaming it an hour and a-half in a basin or cloth, as in this case. When in Scotland, we always had our wheat ground like oatmeal, and porridge frequently made of it; and when eaten with sweet milk, it makes a nice light supper, preferred by many to butcher meat at this hour. We have frequently had wheatmeal porridge, barleymeal porridge, and oatmeal porridge on the table at the same time, when individuals of the family or strangers present preferred them. A farm-house with only one kind of meal in it, is considered in the north a poor house indeed. There are very few labourers

who have not two kinds, and some three and four, pea and beanmeal being also used. Oatmeal pudding, when made in a basin or cloth, after the English fashion quoted in a preceding article, requires vastly more boiling also; and when steamed for an hour and a half, eat raw like brose, and are not so well done as when boiled from five to ten minutes, after the northern fashion.

The reason of this difference of time required to cook wheaten meal in puddings is obvious; for the first effect of the boiling water, when it is put into it after the English recipe, is to coagulate the gluten and jelly the starch of the flour on the outside, closing up every pore in a manner so as to exclude water and retard the ingress of heat; thus delaying and often preventing the proper coagulation and jelling of the gluten and starch. In proof of this, we may notice the fact, that when porridge is made of fine flour it is almost impossible to prevent knotting. Now those knots may be boiled for a long while before the water reaches to the interior of them, the flour turning out dry when they are broken with the “porridge-stick” or back of the spoon when they come to table, the coagulated flour on the outside keeping out the water. When the gluten of the flour is reduced to a proper coagulum, and the starch to a jelly, the pudding is done; and the time required for this purpose is much shorter than generally imagined, provided heat and water are not excluded as above. Cooks are familiar with the short time required to boil an egg, for instance, so as to reduce the white or albumen, which is almost identical in chemical constitution to the gluten of wheaten flour, to a solid or properly croquant degree of firmness. Now in this case there is about 14 per cent. of dry albumen to 80 per cent. of water, or, according to Dr. Bostock—

Water	80.0
Albumen	15.5
Mucus	4.5
	100.0

They are equally familiar, again, with the short time required to reduce starch or arrowroot to a jelly, in proof of which we may quote the following recipe for making “arrowroot jelly,” from “Domestic Cookery, by a lady,” viz.:—

“Put into a saucepan half-a-pint of water, a glass of sherry, or a spoonful of brandy, grated nutmeg, and fine sugar; boil once up; then mix by degrees into it a dessert-spoonful of arrowroot, previously rubbed smooth, with two spoonfuls of cold water; then return the whole into the saucepan; stir and boil it *three minutes*.”

The time therefore required to boil an arrowroot pudding according to this recipe is *only three minutes*, instead of three half-hours, as in the case of a batter pudding, when tied tight in a cloth or basin. In point of fact, the pudding only requires to be brought to the uniform temperature of boiling water to be properly done; so that the practical question for solution is, how can such a temperature be most easily effected in the shortest time? or, rather, how do we account practically for it being effected in the one case in three minutes, and in the other in three half-hours? Why is it so soon done in the one case, and so long of being done in the other?

The long time required to boil a batter pudding has in some measure been already accounted for. The practical error has no doubt arisen from a wish to get it brought to a more solid form than in the case of the old plan of porridge, so as to please the eye better at table, and in the absence of that knowledge of the chemical constitution of elements discovered since the practice was adopted; for it is manifest that if our forefathers had known that three minutes according to the one plan were just as good as ninety agreeably to the other, if not better, they would have chosen the short period, because they were equally familiar as we with the value of time. It had no doubt partly arisen, too, from the erroneous notions entertained as to the manufacture of flour—whiteness of colour and fineness of grinding being taken as the index of quality, instead of chemical analysis—and also partly from the old story of “knife and fork *versus* the spoon.”

The short time required to boil wheaten-meal porridge, on the other hand, arises partly from the effects of stirring, and partly from the water and heat being more uniformly distributed throughout the mass, the central portion being boiled at the same time with the outside. The theory, therefore, is as simple as the practice; and both probably more so than many imagine, requiring only a moment's reflection to be duly appreciated. Were the pudding not stirred, it would thicken at the outside before it was properly boiled towards the centre, when the heat would then require longer time to reach the latter, and bring the whole to a proper temperature and consistency, analogous to what takes place when it is boiled in a cloth tied tightly round it. But the stirring prevents this, by mixing the whole together. When a particle of meal falls into the boiling liquid, for instance, the first effect which it produces is to lower the temperature of that portion of it which it comes in contact with, to its own; while the reaction of the water is to elevate the temperature of the particle to its own, producing thus an equilibrium of temperature somewhat below the boiling point; so that more heat is required to restore it to the highest degree again. If the particle of meal falls at the centre, then the heat has to travel from the outside to it. Now, the effect of stirring is to take the particle to the outside to the heat, and to bring from the outside those particles which are properly done. The particle of flour, however, not only requires to imbibe a certain quantity of heat, but also of water. In its natural state it only contains about 16 per cent., whereas, to produce a proper coagulum, upwards of 80 per cent. is required; so that 64 per cent. and upwards of its own weight of the boiling liquid has to be absorbed before it is properly boiled, which is also a work of time. The time required to absorb this quantity of water is, no doubt, very short; for, if you only dip a particle of the meal in boiling-water, it will be wet to the centre before it is taken out again under the greatest expedition possible; but the water thus absorbed loses the proper temperature, so that time is required to restore it again as above stated; hence the antagonistic phenomena experienced in bringing up the pudding to the boiling point and proper state of coagulation, not

unfaithfully represented by the sputtering ebullition exemplified in making porridge.

From these facts of the case, the advantages derivable from surrounding each particle of meal separately, as it were, in a boiling medium, or with heat and water of a proper temperature, will readily be appreciated (as we have said), and also the disadvantages of steaming batter in a basin, boiling whole wheat, as practised by the boatmen of the Vistula, quoted from the *Ayr Observer* the other week, whole rice, &c., &c., &c. Batter puddings may sometimes be brought to the proper temperature; but we fear the opposite is too often the case in the cottages of our labouring population, where firing is scarce and time precious, while they seldom or ever contain a sufficiency of water to reduce to a proper state of coagulation the gluten and starch of the flour; and this is done under the mistaken notion of making them firm or *croquant*. Hence the consequences which follow when the labourer eats his dinner, for his *croquant* pudding then swells in his stomach, requiring more liquid, and leaving him no alternative but go to some drain mouth, pool, or pond, half-a-mile it may be from his work, for drink. We are not here theorising, but speaking from the experience of both “man and master,” having eaten cold *croquant* puddings, bread-and-cheese, &c., &c., at the hedge-side when holding the plough, and cannot too severely reprobate the practice as being as much against the interest of the master as the health of his man. The whole wheat puddings of Prussia and Russia are subject to still greater improvement; although it ought to be observed, at the same time, that they have many things to recommend them in preference to the batter puddings of the English peasant. They contain, for instance, more gluten.

We are far from recommending “washy food” for ploughmen; but washy food is one thing, and properly-cooked food, of a sufficiently nourishing quality, another. Wheat flour, cook it in any manner you please, either in bread or puddings, is not sufficient for the food of a hard-working man. He requires a more nourishing diet than those who labour less. Too concentrated a form, however, neither suits his stomach nor purse; and, therefore, he must have a rich plain diet, cooked so as to be the most easily digested—an increase of quantity making up for the increase of nourishment required. But this increase of quantity obviously requires a greater variety than he now consumes, in order to promote the digestive powers of the stomach, so as to get the greatest benefit from his food. The English labourer, for instance, is too much dependent upon wheaten flour, the Scotch labourer upon oatmeal, and the Irish on potatoes. A little pork or cheese is not a sufficient variety with wheaten flour, skimmed milk with oatmeal, or butter-milk with potatoes. And the former not only wants a greater variety, but more improved modes of manufacturing wheaten flour, and cooking it afterwards; for it has already been shown that the more nitrogenous, fatty, and nourishing portion of wheat is given to horses, and that the interior or more starchy and carbonaceous is not only improperly cooked, but at an expense of fire and time tenfold greater than it might be.

AGRICULTURAL STATISTICS OF THE UNITED STATES.

The census statistics just issued furnish a condensed view of the present condition of agriculture in the Union, and a statistical account of its progress for the past 10 years. We have not room for the elaborate tables which are incorporated in this part of the work, but the principal facts exhibited by them are noticed in the following abstract, which will be read with great interest.

IMPROVED LAND.—The quantity of improved land in the United States, by which is meant such only as produces crops, or adds in some way to the productions of the farmer, is reported at 118,457,622 or about $7\frac{1}{2}$ acres to each inhabitant. But, if it be assumed that two-fifths of the population are engaged in other pursuits than that of agriculture, the average extent of improved land to be assigned to each person working and occupying it is not less than 12 acres. In the New England States the average for the whole population is a little more than 4 acres to each person; in New York and Pennsylvania 3.9 acres; in the other middle States, the same. In Virginia the proportion is about 7 acres; in South Carolina, 6 acres; in Kentucky, 12 acres; and in Tennessee, 5 acres. The value of the farms in the United States is returned at 3,270,733,093 dols. The return as to unimproved land is to be understood as including the land connected with or belonging to those farms from which productions are returned. In the present unsettled state of large portions of the country, this classification is of less practical utility than it will become at a future day, when similar returns will facilitate calculations respecting the quantity of land brought into requisition annually for agricultural purposes. The average value of land in the United States, attached to farms and plantations, both improved and unimproved, is given at 10 dols. 79 c. an acre.

FARMING IMPLEMENTS AND MACHINERY.—The United States is remarkable for the ingenuity of the people in inventing, and their readiness in applying labour-saving expedients in agriculture and all other departments of industry. Accordingly, the item of the value of farming implements and machinery is a very large one, showing that 151,000,000 dols. are invested in implements and machines for aiding and abridging the work of the hands in cultivating the earth and in preparing its produce for consumption.

DOMESTIC ANIMALS.—According to the census returns of 1840, there were in the United States 4,335,669 horses and mules, 14,971,586 neat cattle, 19,311,374 sheep, and 26,301,293 swine; of 1850, 4,335,358 horses, 559,229 asses and mules, 28,360,141 horned cattle, (including 6,392,044 milch cows, and 1,699,241 working) 21,721,814 sheep, and 30,316,608 swine. The number of horses has not increased with the same rapidity as other kinds of stock, for the reason that the great extension of railroads in the northern States, between 1840 and 1850, had superseded the necessity for a large proportion of those employed for travelling purposes. In

the new States of the north-west, into which at the date of the census railroads had not been generally introduced, the increase of horses had kept pace with the population. There is one horse to each five persons in the United States. The 500,000 asses and mules returned are almost confined to the southern States, where the climate is better adapted to this animal than to the horse. In 1850, there were returned 18,355,287 milch cows, working oxen, and other kine, being an increase of 3,383,701 for the 10 years since 1840, or about 29 per cent. The amount of butter produced in 1850 was 313,266,962 lb., and of cheese 105,535,219 lb. The average value of the exports of these two articles from the United States during the 10 years has been 1,000,000 dols.; during the last five years of the period it has been 1,400,000 dollars.

SHEEP AND WOOL.—There was between 1840 and 1850 an increase of 2,309,108 in the number of sheep in the United States. In New England there has occurred a remarkable decrease in their number. There were in that division of the Union, in 1840, 3,811,307; in 1850, the number had declined to 2,164,452; being a decrease of 1,646,855, or 45 per cent. In the five Atlantic middle States—New York, New Jersey, Pennsylvania, Delaware, Maryland—there was a decrease from 7,402,851 to 5,641,391, equal to 1,761,460, or about $22\frac{1}{2}$ per cent. In Pennsylvania there was a gain, however, during this period of 155,000 sheep. While there has been a positive diminution of 3,408,000 in the States above named, there has been an augmentation of 5,717,608 in those south of Maryland and west of New York. Ohio has gained most largely, having been returned as pasturing in 1840, 2,028,401, and in 1850, 3,942,929; an increase of 1,914,528, or nearly 100 per cent. In each of the States south and west of the lines above indicated there has been a very large proportional increase in this kind of stock, and there is reasonable ground for the opinion that the hilly lands of Virginia, North and South Carolina, Tennessee, and the prairies of Illinois, Iowa, and Texas will prove highly favourable for the rearing of sheep for their wool and pelts. New Mexico has the extraordinary number of 377,271 sheep—more than six to each inhabitant; proving the soil and climate of that new territory to be well adapted to this description of stock, and giving promise to a large addition from that quarter to the supply of wool. But there is no reason to expect that the American Union will produce wool for export for many years to come. The average amount imported annually, from 1840 to 1850, was 14,000,000 lb., mostly from South America, and the quantity is rapidly increasing. In the year 1851, the importation amounted to 32,548,693 lb. The growth of wool in 1850 is returned at 52,789,174 lb., being an increase on the production of 1840, of nearly 17,000,000 lb., or about 46 per cent. In 1840 the average weight of the fleece yielded by each sheep was 1.84 lb. In 1850

it was 2.43 lb., exhibiting an increase in the average product of each sheep of 32 per cent., and thus affording an indication of a great improvement in the breeds of sheep in the United States. This improvement is chiefly manifested in the returns relative to Vermont, Massachusetts, and New York. The value of the live stock in all the States and territories is returned at the considerable amount of 543,969,420 dols.

WHEAT.—The most important grain crop of the United States, next to maize or Indian corn, is wheat. The entire amount produced in 1849, the year to which the returns apply, was 100,503,899 bushels, being an increase over that of 1839 of 15,615,378 bushels. In the six New England States the culture of this grain appears to be declining, as the crop has fallen off, in 10 years, 50 per cent. In the six old wheat-producing States, from New York to Virginia, including both, there was an increase of 6,140,000 bushels, equal to 15.27 per cent. This portion of the Union seems better adapted, from the character of its soil and climate, to the permanent culture of the grain. In the four principal States of the north-west the wheat crop was augmented, during the 10 years, from about 10,000,000 to 25,000,000. It is from this district that the largest supplies for export are derived. The crop of 1849 was a short one over the greater part of the United States, but particularly in the north-western States. Could the crop of the following year be substituted for that given in the census returns, it is the opinion of the best agricultural writers in the Union that the aggregate would be shown to be 130,000,000 bushels. The exports of flour, wheat, and breadstuffs from the United States have declined more than half since the year 1846, but it appears that the cause of this has been rather the cessation of an extraordinary demand than any diminution in the ability of the country to supply.

RYE.—The production of rye has decreased 4,457,000 bushels in the aggregate; but in New York it is greater than in 1840 by about 40 per cent. Pennsylvania, which is the largest produce, has fallen off from 6,613,373 to 4,805,160 bushels. Perhaps the general diminution in the quantity of this grain now produced may be accounted for by supposing a corresponding decline in the demand for distilling purposes, to which a large part of the crop is applied. During the year, ending June 1, 1850, there were consumed, of rye, about 2,144,000 bushels in the manufacture of malt and spirituous liquors. According to the census returns of 1840 the product of the country was 18,645,567 bushels; in 1850, 14,188,637 bushels.

INDIAN CORN is the most universally cultivated crop of the United States. It is a principal product of the farm in nearly every State of the Union. It is a favourite article of food with numerous classes of the people, and is used in all parts of the country for the subsistence and fattening of stock. According to the census of 1840, the corn crop of the United States was 377,531,875 bushels; of 1850, 592,326,612 bushels. The increase of production was 214,000,000 bushels, equal to 56 per cent. The production of New England has advanced from 6,993,000 to 10,377,000 bushels, showing an in-

crease of 3,384,000 bushels—nearly fifty per cent. New York, New Jersey, Pennsylvania, Delaware, and Maryland increased 20,812,000 bushels—more than 50 per cent. In the production of this crop no State has retrograded. Ohio, which in 1840 occupied the fourth place as a corn-producing State, now ranks as the first, Kentucky second, Illinois third, Tennessee fourth. The crop of Illinois has increased from 22,000,000 to 57,500,000 bushels, or at the rate of 60 per cent. in 10 years. The rate of production is from 30 to 140 bushels per acre. The exports of Indian Corn and meal for several years have been as follows:—In 1845-6, 1,286,068 bushels of corn and 298,790 barrels of meal; in 1846-7, 16,326,050 bushels of corn, and 948,060 barrels of meal; in 1850-51, 3,426,811 bushels of corn, and 203,622 barrels of meal. More than 11,000,000 bushels of Indian corn were consumed in 1850, in the manufacture of malt and spirituous liquors.

OATS.—The crop of oats increased from 123,071,344 bushels in 1840 to 146,678,000 in 1850. It is a crop which does not enter into the foreign commerce of the country.

RICE.—The production has increased from 80,841,422 lbs. in 1840 to 215,312,710 lbs. in 1850. The present culture of rice in the United States is chiefly confined to South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas. The yield per acre varies from 20 to 60 bushels, weighing from 45 lbs. to 48 lbs. when cleaned. Under favourable circumstances as many as 90 bushels to an acre have been raised. The consumption of rice is increasing in the United States, and the exportation is rather decreasing.

TOBACCO.—According to the census returns of 1840, the amount of tobacco raised in the United States was 219,163,319 lbs.; of 1850, 199,752,646 lbs.; showing a decrease in its culture of 19,410,673 lbs. It seems probable that this crop, hitherto a most important staple, will gradually decline until it ceases to be a leading article in the agricultural and commercial statistics of the United States.

COTTON.—According to the census returns, the cotton crop of 1840 was 790,479,275 lbs.; of 1850, 987,449,600 lbs.; showing an increase of 196,970,325 lbs. It appears that the culture of cotton is rapidly diminishing in Virginia and North Carolina. In those States it is doubtless giving place to other productions of the soil. There has been a very heavy falling off also in Louisiana, and no appreciable increase in Mississippi; but the diminution in the former State, and the failure of any advance in the latter, are accounted for by the terrible inundations of the Mississippi and its tributaries. But for that calamity it is probable that their increased yield would have equalled that of Alabama, which now occupies the first place as a cotton-planting State, and has almost doubled its production since 1840. Immense as the extent and value of this crop has become, it is not extravagant to anticipate a rate of increase for the current decennial period which will bring up the aggregate for the year 1860 to 4,000,000 bales. The average annual yield for the five years ending with 1835 was estimated at 1,055,000 bales; for the

same period ending in 1840, 1,140,000 bales; for a like period terminating with 1850, 2,270,000 bales. Had no disturbing cause interrupted the progressive advance, the amount of 1850 would have exceeded 3,000,000 bales.

BARLEY.—In 1840 there were produced 4,161,504 bushels of barley; in 1850, 5,167,916 bushels; increase, 1,050,512 bushels. The consumption of barley for the past year in the manufacture of malt and spirituous liquors amounted 3,780,000 bushels.

POTATOES.—The production of the commonest species of this root, called the "Irish potato," though indigenous to the American continent, has fallen off since 1840. The crop of 1849 was 65,796,000 bushels, supposed to be about 18,000,000 bushels less than that of 1839, although the exact truth cannot be ascertained, as, in the tables of 1840, the two varieties of the common and the sweet potato were included in the same statement. The crop of sweet or Carolina potatoes increased from an estimated quantity of 25,000,000 bushels in 1839, to 38,000,000 in 1849.

FLAX AND HEMP.—The census returns of 1840 show that there were raised in the United States 95,251 $\frac{3}{4}$ tons of flax and hemp; of 1850, 35,093 tons of hemp, and 7,715,961 lbs. of flax. The correctness of the returns as to hemp, in the seventh census, has not yet been perfectly verified. There has been some doubt whether, in a number of instances, the marshals have not written tons where they mean pounds. If, however, the returns are allowed to stand without reduction, it would appear that the cultivation of hemp and flax has not materially changed since 1840. The capacity of the United States to produce flax and hemp is almost without limit.

Efforts are now making to introduce Mr. Claussen's method for the separation of the fibre of flax from the woody and useless parts of the plant into the flax-growing districts of the country; and, should they succeed, the returns of the next census will prove the cultivation and manufacture of flax to be one of the most important interests in the United States.

SILK COCOONS.—The attempt to introduce the silk culture into the United States has been a failure. In 1840 there were produced 61,552 lbs. of cocoons; in 1850, but 14,763 lbs. The decrease dates from an earlier period than 1840.

SUGAR.—The cultivation of sugar is carried on in Louisiana, Texas, Florida, Alabama, and to some extent in Georgia and California. It is now a very important interest, and is rapidly increasing. Hitherto the amount of sugar and molasses consumed in the United States has exceeded the quantity produced; consequently there has been no direct occasion for their exportation. In the year 1815 it was estimated that the sugar made on the banks of the Mississippi alone amounted to 10,000,000 lbs. In 1818 the entire crop of Louisiana was only 25,000,000 lbs.; in 1850, it had reached the enormous quantity 226,001,000 lbs., besides about 12,000,000 gallons of molasses. According to the census of 1840, the amount of cane and maple sugar raised was 155,100,800 lbs., of which 119,947,720 lbs. were raised in Louisiana. By the census of 1850 the cane sugar made in the United States was 247,581,000 lbs; besides 9,700,606 gallons of molasses; maple sugar, 34,249,888 lbs.; amounting to 281,830,886 lbs., showing an increase, in 10 years, of 126,730,077 lbs.

EPIDEMICS, TOWN DRAINAGE, AND MANURING THE LAND.—No. III.

SIR,—If in No. II., which appeared in the *Mark Lane Express* of the 24th ult., I did not demonstrate that the potato disease is referrible to ammonia, I showed at least that from combustion alone, in the world, there is generated annually sufficient of that gas to powerfully influence all the sugar and starch-forming portions of the vegetable kingdom, which, it is beyond all question, have become diseased since the extensive use of coal; and I will now endeavour to trace the source of the formation of nitric acid, the existence of which in the rain-water collected by Mr. Pusey was demonstrated by Professor Way.

That the atmosphere is the grand emporium from which is derived the nitrogen of the constantly-accumulating ammonia and other nitrogenous matter, I think must be readily admitted; but the oxygen set free by the abstraction of this nitrogen cannot represent that of nitric acid, since this compound is composed of five equivalents of oxygen (40) to one of nitrogen (14), whilst atmospheric air is composed of one volume of oxygen to four of nitrogen; and as the following extract from the concluding of a series of fourteen papers, which appeared in the *Mining Journal* of 1851, under "Atmospheric Influences," will show that the formation of nitric acid was deduced, without a knowledge of the process being in operation, it is hoped the evidence it affords of the present inquiry being something more than mere speculation, will induce the agriculturist further to investigate a question in

which he is evidently so deeply interested: "If, then, these be the natural consequences of the disinterment of the coal-beds, however slow may be the operation, the gradual withdrawal of nitrogen from the atmosphere, and the corresponding addition of carbon to the soil, cannot fail in producing a progressive change in the soil, and possibly the generation of nitrates."

That carbon, in combination with other bodies, has a powerful electrical influence, and that ammonia acts as a solvent on the mineral kingdom, which is composed in a great measure of oxygen, are facts too well established to require further comment. The question, then, resolves itself into the formation of the nitric acid, and which the above premises clearly define; the annual addition of 60,000,000 tons of carbon to the soil increasing its electrical action, and thereby causing the combination of the oxygen of the mineral kingdom with the nitrogen of the ammonia. That nitric acid was not contained in rain-water in former years, Mr. Pusey has afforded incontestible evidence, in his highly-interesting report, from the fact there adduced, of a trace only being detected by Priestley during thunder-storms; and his evidence is no less conclusive of its formation on the large scale being referrible to ammonia and the mineral kingdom, from the instances he adduces of its existence in the French nitre-beds and the dunghills of Devonshire, where lime is mixed with the dung: but then, if this energetic fertilizer be thus formed, how comes

it in rain-water?—a question which a few well-established facts will readily solve.

Before rain, but more especially before a thunder-storm or heavy rain, the atmosphere becomes negatively electric, or close and oppressive; “fire,” or escaping electricity, is not unusually observed at the mastsheads of ships; in towns, the drains become highly offensive, owing to the escape from them of gases which under ordinary circumstances are of greater specific gravity than air, and the air itself becomes surcharged with moisture, as is evinced by the rapid condensation on the walls of our dwellings: and it is, I conceive, under such conditions as these that the lower portion of the atmosphere becomes charged with nitric acid, which combines with the falling rain. If this be a correct view of the question, it is clear that all showers cannot contain an equal amount of nitric acid, and that on which was based Mr. Pusey's estimate may have been highly charged. It is impossible, in fact, that so appreciable a quantity as that given in his report could so long have escaped the notice of such distinguished analytical chemists as M.M. Liebig and Boussingault.

Be, however, the amount what it may, it must, I should think, be evident to the most ordinary understanding, that Mr. Pusey has raised a question, on incontestable evidence, that cannot fail in revolutionizing the whole system of agriculture as at present understood. All philosophy, if worth anything, should resolve into *£ s. d.*; and the information we possess should, I think, induce us to pause before dogmatically passing judgment on the properties of matter in strengthening vegetation. Although no prophet, I have no hesitation what-

ever in prognosticating that the farmer, ere long, will find it more to his advantage so to manure his land, as to induce in it the formation of nitrogenous compounds, and for which he has at hand every facility, than to send to the other end of the world for a material which, on the evidence adduced by Mr. Pusey, his land may not be in a fit condition to receive. “That substances strengthen vegetation mainly by their contents of nitrogen,” is unquestionable; but it is very questionable how they act on the vegetable kingdom, carbon being the staple: and, pending the solution of this question, the proportional waste of the agriculturist, while groping in the dark, may be exceeded only by that on the ventilation of the Houses of Parliament, of which the Government was warned in 1845. Natural laws cannot be set at defiance with impunity; and of their existence, clear evidence is given in No. 1.

Our testimony of there being a progressive change in the electrical state of the earth and the atmosphere being self-evident, it cannot be matter of surprise that the diseases of animals which are constantly exposed to all the vicissitudes of weather should also undergo a change, more especially in affections of the lungs; and it is to be hoped that the present wasteful practice of turning cattle into the field, so universally adopted by all small farmers, will give place to the more rational system of stall-feeding in well-ventilated buildings, or in sheds well provided with straw.

FRANKLIN COXWORTHY,

Author of “Electrical Condition.”

Maresfield, Sussex, May 17.

BREACH OF CONTRACT. — ADULTERATION OF GUANO.

Statists will assure us that the annual consumption of port wine in Great Britain alone far exceeds the production of that very popular vine. It is, indeed, only a matter of necessity that it should be so. The customer *will* have his glass of port; his habits or his health demand it, and thus the merchant is compelled to do the best he can for him. If an adequate supply of the genuine wine is impracticable, he exercises his abilities to manufacture something that may pass for it. The consumer, to be sure, may not reap much actual benefit from this method of meeting his demand; he may, the more likely, suffer both in constitution and pocket by the fraud practised upon him. He should remember, however, in the outset, that he asks for what it is very difficult to obtain, or that, like the spoilt child, he will be satisfied with that only which is not to be had. It is, then, but a necessity to pacify him by some means or other.

What port wine is to the body, guano would seem to be to the soil; the same good effects to be traced to its use in a pure state, the same difficulty, too, in procuring it, and a corresponding ingenuity in meeting the call for it. The only difference between the supply of the two articles would appear to be this—that, whereas it is next to impossible to provide a greater quantity of genuine

wine, we might, under more accommodating circumstances, have much more of genuine guano. A wisdom, however, far superior to the reasoning of mere common sense, decides that we shall have no such increase, and so supply and demand are compelled to do the best, or the worst, they can.

The summing up of the trial of Lang versus Choze, printed below, will show how this deficiency is, we fear, but too often made up. Having been requested to give the case in our columns, we do so the more readily from the advantage with which we believe it may be studied by the agriculturist. From it he will learn how systematic is that kind of imposition become to which he, after all, is the especial victim. Men like the plaintiff in this case have, happily, something to fear; but it is the farmer, nine times in ten, who has been the chief sufferer. His own judgment has been questioned; the seasons have been complained of; his very labourers charged with a failure, which has been really due to none of those suspected. He has been asking for that which could not be had, and for bread they have given him a stone.

The case of Lang versus Choze should open not his eyes only. There are many others who may learn something from it. The great monopolists in the guano trade may gather here some of the

effects of that policy they are pursuing. Every possible means is being employed to injure the character of this manure, and more and more will it come to be suspected. The more, perhaps, they will assure us, the better for the genuine article; and at first it may be so. The purchaser, however, will gradually tire of the dangers he is so continually exposed to, and gladly turn to any other commodity that he may obtain on easier and safer terms. There are many such companies now making way, with character and a good object to recommend them, to which it becomes almost the duty of the farmer to give a trial. The thousand pound premium of the Royal Agricultural Society of England, though of course never likely to be claimed, may have done something in starting these; while the practices of such firms as Messrs. Wrampe and Cook will do much more to establish them.

Another class who have a caution in the Exeter cause is that to which the plaintiff belongs. The middle-man, the country agent more particularly, will know now what he has to expect when he gets "a bargain" in guano. He must shut his eyes very closely indeed not to perceive that he is *particeps criminis*, should he retail what is sent him, without the strictest test as to its real merits. Cheap guano, in fact, under the present circumstances, is not to be had; at least if it is, we may rest assured there is a tolerably strong case of robbery somewhere or other.

As to the farmer, we must repeat that our advice to him is to try every possible substitute for guano that he thinks may be found to answer the purpose. If, however, he *must* have it, or, as we are told just now, if he *can* get it, let him be very cautious as to whom he gets it from; and let him, above all others, beware of any "bargains." To have it good and effective he must pay a very high price. It is the wisdom of those who supply it to make him do so. Even then, get it on what terms or where he will, we should almost counsel him still to be suspicious as to what he is using. As Mr. Justice Erle said, in a very able summing-up of this case, "you lose not only your guano, but the crop of your field." When too late for a test the purchaser may have reason to believe he has been deceived. Let him the rather be satisfied *before* he begins to use what has been sent him. He has the means for doing so at very little cost or trouble to himself. The weight of Mr. Lang's case rested on the evidence of those gentlemen who made an analysis—not of the sample, but of the bulk sent in. Any man, we repeat, may at any time command a similar guarantee. Professor Way, of the Royal Agricultural Society; Mr. Nesbit, of Kennington; and Mr. Herepath, of Bristol, are already

well known from the attention they have paid to this branch of their profession; and to the two latter our thanks are especially due for their exertions in this instance.

The case itself requires no comment from us. The facts brought out in evidence—the groping for "lumps of something," and so on—the opinion of the judge, and the verdict of the jury, all tend but too clearly to the same conclusion. We can only regard it as an exposure that should be of especial service to the agriculturist. He knows now "the perils that do environ the man who meddles with" Bolivian or Peruvian guano; and he knows, beyond this, by what aid he may insure himself against fraud and loss.

DEVON SPRING ASSIZES.

EXETER, MARCH 17, 1854.

LANG *v.* CHOPE.

SUMMING UP.

MR. JUSTICE ERLE: Gentlemen of the Jury, this is an action which is brought for the breach of two contracts on the part of the plaintiff, and it is also an action claiming damages on account of an alleged false representation upon the sale of guano; and that latter part of the enquiry I shall have to draw your attention to more particularly, because it is the widest and certainly the most difficult enquiry which you have to undertake, and it is to my mind substantially as to the representation being made the same question as to its being a warranty, but different as respects the question as to its being known to be a false representation by the defendants. Gentlemen, I shall take your opinion best on the important matters here, by breaking up the points to be put to you in three questions. As to the claim in respect of the 100 tons of guano, which is the first contract, the declaration alleges that those hundred tons were bought by the plaintiff, and with a warranty that they were Bolivian guano, and according to sample; and as that contract is contained in the letters, I am of opinion that that contract was so, and therefore, with respect to those hundred tons, the only question for you will be, whether those hundred tons were according to the warranty, that is, were they Bolivian and according to the sample sent in the tin? That is the first question with which I shall trouble you. Gentlemen, I will tell you what the other two questions are before I take your answer as to that, and I will then draw your attention to the evidence on that, and ask your opinion upon the other two questions afterwards. The hundred tons had been sent, Mr. Lang sent an order for five tons more, and afterwards ordered 10 tons to be sent by rail to Bristol, being 15 tons, which are the subject of the second enquiry; and inasmuch as that order was contained in a letter, I believe it is within my province to say whether Mr. Lang and the Messrs. Chope intended that that second order should be upon the same terms and for the same article as the former order, and if it is

a question for me, I am clearly of that opinion. When a man has entered into a long preliminary treaty respecting an article to be bought, a hundred tons, and he at the time of the purchase says, "Send me five tons by rail, and also ten tons," I am of opinion it is the same as part of that contract, and means the same article. If there is any doubt about whether it is within your province or not, I shall ask you upon the second question, whether you are of opinion that when the 15 tons were ordered they were ordered in the intention of both parties as part of that former contract. That will be the second question I shall put to you. And the third question is the wider one, was that warranty false, and to the knowledge of Messrs. Chope? That will be the wider question, about which you have had so much evidence on both sides. Gentlemen, if you find any of those causes of action for the plaintiff, the remaining matter for you will be the assessment of damages. Those four heads you will have to be troubled with. Gentlemen, I am going to ask you first of all, was the warranty in respect of the hundred tons, that the hundred tons should be Bolivian guano, and according to the tin sample? was that warranty broken? The treaty commences by a proposal by Messrs. Chope, to send the plaintiff some Bolivian guano resembling Peruvian, and the quality is to be satisfactory in all respects. Now this is their letter in reply to Mr. Lang's: "We shall have much pleasure in entering you 100 tons of Bolivian guano the same as sample." Mr. Lang's reply says, "I will take the 100 tons at the terms you offer," and the price was to be £7 10s. It is perfectly clear therefore, according to the law, that was a contract to sell Bolivian guano according to sample, and according to the tin sample which was sent. Was that contract broken? Now Mr. Lang says that he took out of the 100 tons that were sent down (50, by the Integrity to Exeter) samples, and sent them to Mr. Herepath, and Mr. Nesbit; he sent those samples from the Integrity, from the tin case, and from the lot that he had received by rail, part of the 15 tons, and for our purpose the most material ones are the Integrity sample, which was the bulk delivered, and the sample from the tin sample sent to him by the defendants. Now the evidence of Mr. Herepath and Mr. Nesbit is extremely short on this subject, and the result of it is this, if you believe them, that the guano in the tin samples, was at least three times as good as that which was in the bulk. If you take the evidence of Mr. Lang, who says that he took the samples fairly at Exeter, and sent them (and you have it further confirmed by Mr. Herepath), that he sent and took a sample according to his judgment, fairly from the 50 tons laying in the stores in Exeter, and that Mr. Herepath then analyzed the samples so taken; if you believe Mr. Herepath and Mr. Nesbit, then the bulk did not correspond with the sample, but on the contrary, the tin sample was of three times the value of the bulk that had been sent to Mr. Lang. Gentlemen, it does not rest entirely upon the analysis of Mr. Herepath and Mr. Nesbit: there is the additional evidence in the case, of the manufacturing of the article at Greenwich, which goes to show, if you believe it, that it was not likely at all to be good Bolivian,

but a mixture made at Greenwich. Gentlemen, I do not propose to read to you the evidence, but I call to your minds the evidence of Jones, the foreman of Messrs. Cooke, who was employed at Greenwich. He stated, "We had a rule for mixing Dutch ashes, loam, aressia, and various articles, with a little Peruvian guano, and we manufactured according to the orders we received from time to time. Sometimes 50 tons or 100 may be sent; it was sent by the lighters of Allen; there were 7 or 800 tons so manufactured at Greenwich. It was sent by the Joseph and Mary, and various other vessels; about 800 tons were sent to Messrs. Chope and Son, at Bristol." Then Mr. Burmeister, who was the clerk of Messrs. Wrampe, with whom Messrs. Chope corresponded, says, the guano sent from Wrampe's to Chope and Son was manufactured at Greenwich by Cooke and Company. Therefore that fact may be taken as perfectly clear; and I think it is confirmed still further by this fact, that if it was good Bolivian guano, it would not have been sold at that price, as it would be pretty nearly as good as Peruvian, and there would be very little difference in the price. Then you have the evidence of six or seven farmers, who bought from one or two tons to a few hundreds of the guano of Mr. Lang, which was a portion of that which came from Greenwich; and they stated it was of no use, and made no difference whether it was sown in single layers or double—that the crop was just the same. That is the strength of the evidence on the part of the plaintiff to show that this was not Bolivian. The only evidence on the other side is by Mr. Smith, the chemist from London, whose analysis was entirely of a lot of the Exeter samples, taken by young Mr. Chope; and of what he had so taken, a few ounces were sent to Mr. Smith. Young Mr. Chope stood before you, and it is for you to say whether he was open to the observations that were made about the evidence he was giving. And it does appear to me to be a strange thing, that that simple-minded witness suspecting that there was no fraud, and not wishing to take any part in it (Drake, the storekeeper), lets him do what he pleases, and he says, "I will go to the door." Young Chope says, "I wish you to stand by, and see as to the samples I take—that it is a fair sample." And so he stood by and watched, and saw him struggling to get something in the bag, and trying to get something with a good deal of difficulty. "Here," says Drake, "is a bag open, which you can get at easily." "No," says Mr. Chope, "here is a knob which I must have;" and he took that away. If that be true, and this was a part of that which had been mixed at Greenwich, why then it contained some Peruvian guano; and if he took this as a sample of one of the knobs, and put a portion of it into the letter for Mr. Smith, the analysis would be that of good Peruvian guano, and Mr. Smith's analysis does pretty nearly fall in with that; because his analysis is 6 per cent. of nitrogen, and, according to Mr. Herepath's analysis of the fair sample, it was 4 and 96—very near 5 per cent. of nitrogen only; and therefore that which Mr. Chope took out of the same lot was considerably better than the sample, and very different from that which Mr. Herepath and Mr. Nesbit had. Gentlemen, will you be so good as to say whether the 100 tons in your judgment

were according to sample, and were they in your judgment Bolivian. [The jury deliberated a short time.] Gentlemen, were the 100 tons according to sample?

The FOREMAN.—Our judgment is that they were not.

Mr. JUSTICE ERLE.—Were the 100 tons, according to your judgment, Bolivian guano?

The FOREMAN.—They were not.

Mr. JUSTICE ERLE.—Now, Gentlemen, the second question I shall put to you will require greater attention of you, because it depends upon your view of the case more than mine; and that is, whether the two orders of five tons and ten tons were by the parties to that contract agreed to be delivered on the same terms as the 100 tons? And I shall draw your attention a little to the letters. The first letter is that of the 8th of March, 1853, from the defendants at Bristol to the plaintiff: "As the time for the use of guano is now fast approaching, and this article being considered by all practical farmers as the cheapest manure. We beg to inform you that we have large quantities of fine Bolivian, both here and in London, which in appearance resembles that of Peruvian, whilst its qualities have been proved very good for all root-crops. Some of our analyses, taken by Mr. Herepath, show that 1lb. is equal in fertilizing power to 21lb. of farm-yard dung; and as we are so deficient in stock, we would strongly recommend our friends to make early purchases, as the import into the United Kingdom is only 90,000, against 228,000 tons, compared with the corresponding period of the previous year. Our price, delivered here, for fine Bolivian, is £8 10s.; and in London, £8 per ton." Then, on the 24th, Mr. Lang writes to the defendants: "In reply to yours of the 8th inst., with sample of Bolivian guano, I should wish you to send me a 7lb. sample per rail, and state your lowest terms for 100 tons, either at Exeter or Bristol or London. If either of the latter, name the wharf it is at; and enclose an order for my seeing it. Yours, &c., J. Lang. Please enclose copy of Herepath's analysis." Then comes the letter which Mr. Lang says encloses Mr. Herepath's. The defendants say: "We have the pleasure to acknowledge the receipt of your favour of the 24th inst., and have to-day forwarded per rail to your address a sample-tin of our guano, the quality of which has given our friends every satisfaction, having sold very largely indeed; and we are enabled to make you an offer of 100 tons, which we guarantee in every respect equal to the sample forwarded, at £8." And they go on with the treaty, and ultimately 100 tons is sold at £7 10s.: that is all relating to that 100 tons. Then, on the 31st of March, the defendants write: "We have the pleasure of receiving yours of yesterday's date, and notice you accept our offer of 100 tons of our Bolivian guano, as sample forwarded to you, at £7 10s." The next letter is of the 4th of April, from defendants: "We refer to our last respects, and hope now shortly to wait upon you with invoice." The correspondence is kept up until the 6th of April, so that it is a continuous correspondence; and I want you to take into your consideration this long treaty, which was going on in the minds of both parties down to the 6th of April; and then Mr. Lang writes thus: "I now wish you to forward me to-morrow,

mileage rate, 5 tons of guano from Bristol, without fail, and oblige." Then they send down word that the guano must be at £8 5s. per ton for the first lot, because the market had risen: "Be pleased to accept our thanks for the information you furnished us with. The above is now the very lowest price we can sell at—indeed, our price is £8 10s., but to our customers who have bought largely of us; and we refuse altogether to supply fresh orders at any rate." And then he ordered 10 tons more. Now, the question I have to ask you is, whether you are of opinion that, in the understanding of both these parties, these subsequent orders, amounting to 15 tons, were understood by both parties to be on the same terms and on the same warranty as the first 100 tons were?

[The jury deliberated.]

What do you say, gentlemen?

The FOREMAN: Most unquestionably.

Mr. JUSTICE ERLE: Now, gentlemen, comes the question, Was the warranty false, to the knowledge of Messrs. Choze? The plaintiff has shaped one set of counts alleging the warranty, and that it was broken. And every one of you will know that a vendor who sells the article and warrants it, if it turns out to be untrue he is liable to an action whether he knew it or not. It may happen that he is a most honourable man. In selling a horse, if you warrant it, the person selling is made answerable for a breach of that warranty, because the dealing was upon the faith of the warranty, and was one of the terms. The plaintiff here is obliged to speak with greater caution, because you are obliged to allege when a party sells an article; and representations are made at or about the time of the sale which are not part of the contract of sale—if those representations are false to the knowledge of the party who made them, that they were made for the purpose of inducing the plaintiff to purchase, and then an action will lie, although they could not be called in terms a warranty. That is the cause of action here. The representation alleged to be made is one which you have just found as to the 15 tons: if he warranted them Bolivian guano, and, according to the tin samples, of course he represented them to be so. A man cannot warrant without representing; although he can represent without warranting. They have put their case upon that foundation, and they insist on that being tried; and you must answer it. They say they represented that those 15 tons were Bolivian; and, according to sample, there is no doubt now that that representation was not true in point of fact, and I take that to be found by you as to the 15 tons just the same as to the other. But then comes the question, was the representation false to the knowledge of the Messrs. Choze? Did they know that it was not Bolivian, and that it was not according to sample? With respect to that, it is rather of the widest inquiry. The case on the part of the plaintiff was, that the first letters contained exaggerated phrases as to the price, for the purpose of inducing the purchase. But you would, I think, allow a vendor to puff off his wares if he likes. If I had had anything to do with this correspondence, it would have been a suspicious letter to my mind; but you are to say whether the line of con-

duct pursued by the Messrs. Chope brings home to your minds satisfactorily that they knew that it was neither Bolivian nor according to sample. The letter says this—“As the time for the use of guano is now fast approaching, and this article being considered by all practical farmers as the cheapest manure, we beg to inform you that we have large quantities of fine Bolivian both here and in London, which in appearance resembles that of Peruvian, whilst its qualities have been proved very good for all root crops. Some of our analyses taken by Mr. Herepath state that 1lb. is equal, in fertilizing power, to 21 lbs. of farm-yard dung; and, as we are so deficient in stock, we would strongly recommend our friends to make early purchases, as the import into the United Kingdom is only 90,000 against 228,000 tons, compared with the corresponding period of the previous year. Our price, delivered here, for fine Bolivian is £8 10s., and in London £8 per ton.” Upon which Mr. Lang says—“I wish you would send me a 7lb. sample, with the analysis.” Then their next letter is—“We have the pleasure to acknowledge the receipt of your favour of the 24th instant, and have to-day forwarded per rail to your address a sample tin of our guano, the quality of which, has given our friends every satisfaction, having sold very largely indeed, and we are enabled to make you an offer of 100 tons, which we guarantee in every respect equal to the sample forwarded, at £8, including cost, freight, and insurance, to Topsham or Exeter, if a vessel could get at these places, your giving us directions where the vessel is to go; this offer we shall be obliged by your giving us your decision as soon as you receive the sample, as we have very little to sell, as there is no Peruvian here for sale; and we positively have an offer to-day to ship to London 100 tons Peruvian at £10 and cannot get it. In Liverpool, Gibbs' have no Peruvian, and they are now getting £10 of the dealers; in consequence of this, Bolivian has advanced 15s. to 20s. per ton also, and we are quite confident we shall not have a pound to offer very shortly, having made such extensive sales here and in London; we would say 10s. less in London, the bulk of our guano can be seen at Radcliffe wharf here, being precisely the same part of our bulk in London, and such would be shipped up, usual tare and draft, and discount. Can you inform us of a dealer who has 100 tons of Peruvian to sell us? we should be very glad to buy it, as we cannot get any anywhere. Waiting your reply, we are, sir, your obedient servants, T. Chope, and Son. P.S. The colour of our guano resembles Peruvian in the highest degree.” Then on the 29th of March they say, “We have your favour of the 28th inst, and shall have much pleasure in entering you 100 tons of our Bolivian guano as sample forwarded to you at £7 10s., free on board in London, half cash, less 2½ off, and half bill four months, by your giving us a reference or so, being as yet strangers. We feel a delicacy in inquiring of the parties you mention, as it would seem as if we were interfering with their customers, otherwise we should be happy to apply to them, who are friends of ours. Our guano is not lying in docks, but would, as usual, be delivered in lighters to any vessel or place you may require; and as guano is very scarce, please let us

know if you agree to our proposition per return of post, as we are obliged to keep the business open for you, and cannot reply to the numerous enquiries we have for guano at higher rates.” That is the line they pursue. Some vendors may think it enough to offer their goods, stating simply their character, and leaving the purchasers to ascertain all other matters for themselves; but there appears to me to have been here a considerable effort in pressing off their wares. These wares were sent by these parties; and you may take it now to be established, that they came from Greenwich, from the manufactory, and were not as good as the sample, and according to the farmer's account, they were worth nothing at all. What sign is there that the parties knew it? Why the large quantity coming through Messrs. Wrampe alone to Bristol might lead to a suspicion that the guano may have been in the hands of a fraudulent manufacturer, who may have made it with loam and other articles, and the Messrs. Chope appear to have dealt with the Wrampes to a very large extent. Now the first bit of direct falsehood, if it is made out to your satisfaction, would go strongly to convict them. Did they send an analysis of guano which they knew to be false, in the first letter proposing it for sale? The letter states it refers to Mr. Herepath's analysis. Mr. Lang says—“Send me a copy of Mr. Herepath's analysis.” And Mr. Lang produced the letter of the 26th of March, in which he swears there was the analysis, which he afterwards advertised, and which you looked at, and it contained, nitrogen 8 per cent., and so on—a valuable manure; a very favourable analysis indeed; and Mr. Lang swears he received, and that Chopes sent it in the letter of the 26th of March. The defendant says he did not send that analysis, and he is asked about having the analysis, and his explanation of not sending the analysis was really a confession of a very great intentional fraud; for he says, “We recommended a large lot of guano in 1853, and I did not send the analysis, but I referred to an analysis made by Mr. Herepath of a lot of goods sent in 1852, of which portions may have remained, or may not have remained; possibly there was not an atom left then. Now I should think, as Mr. Lang's statement does so tally with the probable course of things, that you would probably be of opinion the analysis was sent; for when Chope says, “I have got the analysis,” Lang writes, and says, “Send me the analysis.” And the analysis came; and the sample in the tin and the letter came. “The tin sample will be sent,” but not a word more about the analysis. Why, it was enclosed in the letter. It speaks for itself: if it had been refused there would have been an explanation of the cause; but the letter tallies exactly with Mr. Lang's statement. Step the first—falsehood made about the analysis; because Mr. Herepath says that none of this was ever up to the mark of that analysis of 1852. That is, therefore, a misrepresentation made; and if the analysis was sent, it was a fraud, as Mr. Chope acknowledges that it related to another lot of guano, and which he knew had no reference to that which he desired the purchaser to take. Then Mr. Chope, jun., seems to me to be very inconsistent in the statements which he has made before you.

Is this a fraud and delusion practised upon respectable and unsuspecting merchants of Bristol by Messrs. Wrampe and Company? He wished very much to put forward a long line of correspondence, to make out that there had been several consignments of guano in the course of trade from London, in which the consignors were Wrampe and Company; they were consignees, which they effected on the faith of representations contained in these letters. The letters appeared to me by no means to make out a consistent course of dealing. Mr. Chope, sen., says Wrampe offered the guano. Mr. Chope, jun., says—"We write you to know if anything can be done." Mr. Chope, sen., says they were all joint purchases. Mr. Chope, jun., says, "The 500 tons was a purchase by my going up to London and buying of the Wrampes, after a great deal of trouble, and beating them down from £6 odd to £5 12s. 6d. and £5 17s. 6d., because they would lie so long in our hands." If the invoices were put in they would show the prices. The invoices of those which purport to be bought on the joint account of Chope and Son, and Wrampe and Co., did not at all tally with that, as the price is £6 5s., and you have Mr. Chope junior's notion about that. After they were produced, he said they were not the proper invoices. It is for you to say whether this is according to the course of mercantile usage. He says: "I saw the other invoices in the hands of my attorney, but they are not brought forward or produced before you." Then he says: "These are Messrs. Wrampe's invoices; he gave them to me at the last time I saw him." Mr. Chope, senior, said that his son had seen Mr. Wrampe, as far as I know, within a very few days of the present time, in London; and he says he expected that he would come down and tell you that he had been the consigner of Bolivian guano, and that this guano was according to sample. These were not the invoices sent, but must have been invoices to perform some part in the transaction, and were brought forward contrary to the intention of the parties. It appears to me that, both in respect to the analysis and the invoices, no satisfactory explanation has been offered by them. Then Burmeister swears that he sent the invoices at the time, and that the price was £5 12s. 6d.—£5 17s. 6d. But what has that to do with the £6 5s.? I do not believe that Burmeister meant to deceive you. He says: "My department was with the correspondence; the manufactory was out of my department;" but he is in the pension of a man who may say, "I will write any letter I am ordered to do; I will give you no more information than I can help." He says: "Chopes bought at £5 12s. 6d., but what is bought on the joint account is £6 5s." I could not find that that witness, although he had his faculties about him, meant to tell any falsehood. Then, gentlemen, you have the further account of Mr. Lang's interview with Mr. Chope, senior, when he positively said it was imported in the ship "Cable." Now they both deny they ever had such a ship. Mr. Turner is called, and he says that Chope admitted he knew it for six weeks before, that it was not genuine guano. That was when they had the interview in April, at Exeter. If he had known it six weeks before the 24th of April, that would carry him

back beyond the 26th of March, when the 100 tons were bought. You will consider, on the question of falsehood, whether it is brought home to them. Do you believe those two gentlemen who have come from Bristol, and have both sworn to the way the consignment was made; who both state that they had not the least idea that the guano came from Greenwich, or that it was manufactured, or that it was anything but genuine Bolivian, until a very late hour. The manner of witnesses in giving their evidence is peculiarly for the consideration of the jury. The counsel for Messrs. Chope has very properly said a charge of fraud is not to be lightly formed, or upon light evidence believed by any jury; but, nevertheless, it is perfectly clear that there is such a class of persons in the world who can be fraudulent enough to act in the way imputed here; and Messrs. Wrampe and Cook are unquestionably, in my estimation, fraudulent people—that is if they meant to sell their manufactured article for good Bolivian guano, which was a mixture of totally different things, perfectly right and honest to make an experiment; but if they want to pass it off as fine Bolivian guano, they are fraudulent people, making a spurious article and selling it for a genuine one, and Messrs. Chope, who disseminate it, may be innocent agents, or upon the heads of evidence I have adduced to, they may be the contrary. You will say whether in your judgment the representation that the guano was according to the tin sample, and Bolivian, was false to the knowledge of Messrs. Chope?

[The Jury deliberated a short time.]

The FOREMAN: We believe that they were conscious of the dishonest nature of the transaction.

Mr. JUSTICE ERLE: Then the only remaining matter for you to consider is the assessment of damages, with respect to the 100 tons, that is £150. The action as to that, is for not delivering goods according to the contract, and the measure of damage is always what would have been the profit which the purchaser would have made if he had received the article. In other words, what is the difference of the market price at the time of delivery, when he could have sold it, and the contract price at which the vendor was to deliver it to him. The contract price was £7 10s., and fine Bolivian was selling at £9 and therefore there would be £1 10s. per ton upon the 100 tons, and that would make £150. Then the question is with respect to the 15 tons; he has got four tons in hand at £8 10s. and £8 5s., but the 11 tons have been sent out to different purchasers, and complaints have been made, and a good deal has been returned; the plaintiff has allowed to Mr. Hooper out of £20 worth which he bought, about £13.

Mr. BUTT: About £14.

Mr. JUSTICE ERLE: Something about two-thirds in the case of Hooper, and there are other claims that he will have to meet; but I do not suggest that any party should attack Mr. Lang. With respect to the 11 tons at £8 10s. a ton, that would be about £93; then you take off from Mr. Hooper's about two thirds.

Mr. BUTT: Then we have the four tons remaining, that is about £25 or £26.

Mr. JUSTICE ERLE: Two-thirds of £93 leave about £60 10s., and Mr. Hooper has had £13 returned, that is merely an approximation, then the four tons remaining in their possession £40, and take off two-thirds.

The FOREMAN: About £60 10s.

Mr. JUSTICE ERLE: Well then, gentlemen, the remaining item of claim is for Mr. Lang's special damage, with regard to

the guano, which he has delivered to his customers; that is, he has put off this spurious article upon them, and with respect to the special damage, he says that he is injured in his trade, and in the estimation of people with whom he has dealt; and that is a matter upon which I cannot pretend to give you any test at all, by which you can judge of the damage like the figures I have been putting to you on the other part. If this action had not been brought, and it had not come to the result that it has, I should conceive that Mr. Lang would have been most seriously affected, because the farmers would have found that he was dealing in spurious guano. We are all well aware, from having a little to do with this sort of thing, that you have not only lost your guano, but you have lost the crop of your field. The great object of the guano is to take your crop over the first stage, and if that is lost there is an end of your beneficial cultivation for the year; and farmers, therefore, would take care particularly to avoid dealing with a man who sold them spurious guano. And if this action had not been brought, it would have been, to my mind, a case that required justly serious compensation; and there was one witness whom they have called, Mrs. Elizabeth Whiteaway, who deals with the farmers of that neighbourhood, and she said Mr. Lang had suffered in his reputation in consequence of this. The farmers had got a panic about it, and Mr. Lang in consequence was not allowed to come to her shop to show his samples; and, therefore, to some extent his trade must have been injured: and I say if this action had not been brought, there might have been considerable damage inflicted upon Mr. Lang; but the result of this day's enquiry will be that everybody who hears of it will be of opinion that Mr. Lang has reinstated himself; and I believe the attempt that was made to ask you to give Mr. Lang no damages, because he did not stand well as a trader, and therefore could not have been damaged, being a man himself wilfully palming off bad Bolivian for good Peruvian—the attempt which has been made in that way has failed, and has operated a good deal to the advantage of the plaintiff, if my view of it is right, and shows that Mr. Lang was a man who was willing to keep his word, and believed that he was dealing in a genuine article. In the case of Brock, he sells him some guano; he had not then taken stock, but finding he had sent him some bad guano, he wrote a letter to him, and offered to take it back. Then there is Mr. Hooper, who spoke from the bottom of his heart when he said he made him a hearty reparation—speaking out, as you heard, that Mr. Lang was a most liberal gentleman. Mr. Lang offered him all the money, saying, "Take your money back again." "No," said Mr. Hooper, "give me what you please." There was more said about Mr. Cocker's story; that was, that he bargained for good Peruvian in February, when he had some good Peruvian from Anthony Gibbs; and, as an honest man, he must have intended to supply it from that. His order was left to be completed by his clerk; but he became ill, and his wife interfered, and, according to his account, it was taken from the wrong stock. Then Mr. Brock says he told him he never would have any guano from Bristol. That is the only one who raises any doubt, and I do not think it has any very much weight in it. It is for you to say what, in your opinion, in monies numbered, should be awarded to the plaintiff for this special damage. In addition to that which you give the plaintiff upon the contracts, add that which you think a moderate sum. This action is only brought for the injury which the plaintiff has suffered from last April, when the rumours began about him, to the present March. Mr. Lang's character will be well set up again in the estimation of Exeter and the country, and he will certainly stand as well as he did before. According to your judgment consider what would be a fair

sum for him to receive for the time that his trade has been under a cloud. Some moderate sum, I think, would answer that matter. I will not pretend to offer to you any suggestion for your guidance.

A JURYMAN.—My Lord, we wish to know whether, in giving our verdict, we can include it in one round sum. Can we give one sum for the loss in the price of the guano and the loss of reputation that the plaintiff has sustained?

MR. JUSTICE ERLE.—You can if you please give it in one sum. They can be added together in your verdict. It is quite in your option. It is agreed the first is £150.

MR. SERGEANT KINGLAKE.—No doubt about that.

MR. JUSTICE ERLE.—We need not trouble the jury to sever that. The second damage is £81.

MR. BUTT.—That £81 should be on the second and fourth counts.

MR. JUSTICE ERLE.—Do you assess the damages on each count?

MR. BUTT.—I will take it in that way.

MR. JUSTICE ERLE.—The first count £150, and £81 on the second and fourth counts.

MR. BUTT.—The special damage is applicable to each of the last four counts.

THE FOREMAN.—We find a verdict for the plaintiff upon the whole for £400.

MR. BUTT.—That will be £150 on the first count, and £81 on the second and fourth, and £166 on the third and fifth; which makes the £400. Will your Lordship certify for a special jury?

MR. JUSTICE ERLE.—Yes.

Verdict for the plaintiff—*Damages* £400.

ON THE STORING OF TURNIPS.

SIR,—Last autumn I stored some turnips: they were taken up, and put into heaps in the field, of about a ton each. In March they were carted home and put into one large heap. The bulbs as the spring advanced began to grow, and consequently their quality became deteriorated. I had them examined, and about one stone of salt to the ton sprinkled over them; and the effect was, that it completely stopped their growth and preserved their nutritive properties. They are now in an excellent state of preservation.

If these remarks are of any value to agriculture, you will oblige by their insertion. I may remark that, in the storing of them, they ought to be handled carefully, so as not to bruise the bulbs, or they are sure to decay.

A CORRESPONDENT.

CLOVER SICKNESS.

SIR,—The disease called Clover Sickness is indeed a vexed question, as your own columns sufficiently testify; and I believe no satisfactory conclusion will ever be arrived at, otherwise than by an induction of particulars. Let us, then, glean as many facts as possible that are worthy of note. And here I think is one. Last year I sowed a field with barley and Italian ryegrass and clover, as usual; half the field was manured, same time, with dung, a mixture of stable and yard dung, the other half had no manure. The manured half has a fine and thick plant of clover, the unmanured scarcely any. The clover failed throughout the field the previous time it was sown, three years ago.

Yours, &c.,

DEVONIENSIS.

ON THE HEREDITARY DISEASES OF HORSES AND CATTLE.

TO THE EDITOR OF THE FARMER'S MAGAZINE.

TO THE EDITOR OF THE FARMERS' MAGAZINE.

SIR,—I promised to send you a paper, early in the present year, for publication in the *Farmers' Magazine*. I now fulfil my promise by an Essay on the Hereditary Diseases of Horses and Cattle. You are welcome to print the whole of it, as it may suit your convenience.

Yours truly,

W. F. KARKEEK.

Although certain determinate characters and forms, perpetuated by generation, distinguish the several races or breeds of horses and cattle in this and other countries, yet these distinctive marks are not so arbitrarily fixed but that individuals, in any one of those breeds, may and do differ among themselves, in constitution and temperament, as they are severally affected by varieties of organization, disposing them to different diseases. These predispositions, no less than the varieties of size, form, colour, and other obvious properties, are hereditary and transmissible to offspring; and though the direct proof may not be equal for the two cases, and the effects resulting are of such different importance, yet is it certain that the peculiarities so carried on, from one generation to another, have reference to one common law.

Without entering minutely into the consideration of the cause of such deviations from the primitive or common type of the species, we may remark that certain external circumstances—as food, climate, and domesticity—appear to have had considerable power in modifying animal organization. Possibly the most important influence in this respect is due to the artificial mode of life which some animals lead under the control of man, by which modifications are induced to a certain extent, and are transmissible to offspring. It is to this influence that we may probably attribute the occasional production of accidental varieties, many instances of which may be cited as examples of this singular phenomenon in the reproduction of the species. Thus the polled breeds of cattle sprang from an individual variety, which was preserved by the Scotch farmers, on the supposition that such formed animals would become more quiet and less apt to gore one another than the native races.

The "Ancon" or "Otter" breed of sheep, now established in America, is another striking instance of departure from a common type—a variety that was preserved in consequence of their short otter-

like limbs, which prevented them from leaping fences. We have also another singular example in those races of dogs that have a supernumerary toe on the hind feet, with the corresponding tarsal bones—a variety analogous to the one presented by six-toed or six-fingered families of the human race.

Other cases could be adduced. We cannot, however, term such singular varieties as accidental, since there is nothing in the phenomena of nature to which the term accident can well be applied. The characters are doubtless the result of some organic change proper to the animals in which they appeared; and their transmission to their progeny is only the exemplification of a law common to other cases of transmitted characters.

It is generally allowed that congenital varieties of this character tend to become hereditary; but that changes wrought in an animal after birth are not thus transmitted to offspring. This assertion is especially true in respect of deformities and mutilations, the result of accident or of man's caprice. Changes of this kind occurring during the animal's life commonly end with it, and have no obvious influence on its progeny. Had nature wrought otherwise, the mischances of all preceding ages would have been entailed on us; and cropped dogs and dock-tailed horses would be born ready to our use. But although deformities of this kind are not hereditary, there are certain acquired conditions of the body, the consequence of disease, which are frequently conveyed from parent to offspring. The state of health of either parent, particularly of the mother, at the time when the existence of the offspring commences, has a strong influence in the production of healthy or unhealthy progeny. We shall adduce a great many examples in support of this position in the course of the essay.

The applicability of these remarks to the question of hereditary disease is sufficiently obvious. If new characters are produced in domesticated animals, because they have been taken from their primitive conditions, and exposed to the operation of influences unnatural to them, we can have no reason to doubt that deviations of structure, "whether in the way of deficiency or of excess, or any other new development, are occasionally produced and transmitted; and with these deviations, certain propensities to or conditions of morbid action in the parts thus abnormally organized."

Generally the offspring is born free from disease;* consequently it is not disease itself which is transmitted, but organs or textures of such imperfect kind that they are liable to be morbidly affected by causes which would produce no effect on limbs or textures soundly and normally developed.

Regarding the subject of hereditary diseases in a general way, we shall have to consider—

- I. *Those which are induced by peculiarity of conformation, both in the external and internal parts of the body.*
- II. *Those in the transmission of which the condition of the blood may be supposed to be partly or wholly concerned.*

In treating the subject under these two heads, we shall follow the classification as closely as possible; but, on account of the close and intimate connexion existing between the solids and the fluid portions of the body, in growth, function, and change, there will be a difficulty experienced in some instances, in separating them in the inquiry. Our first example will afford an instance of the kind:—

I. (*a*) *Spavin and other Ossific Enlargements*—the predisposition to which may be either constitutional or local. They are composed of the earthy matters of bone, chiefly invading the tissues low in the scale of organization, such as cartilage and fibrous cartilaginous substances, injuring the structure and functions of the parts, by rendering them rigid and inelastic, and causing partial or complete lameness, depending on the situation and the extent of the deposition.

It is perfectly well ascertained that the progeny of some horses inherit a constitutional tendency to splints, spavins, ring-bones, and other bony deposits, without exhibiting any peculiar conformation of limbs or joints to account for it. These are instances of an *ossific diathesis*, transmitted from parent to offspring; but, on the other hand, this hereditary predisposition more commonly depends on faulty or peculiar conformation.

* Mr. G. Baker, V. S., Reigate, relates the case of a mare that was *farciéd*, and the owner breeding from her, the foal showed symptoms of *farey* soon after birth, and died glandered.—*Veterinarian*, vol. xiii.

We have heard of a similar instance where the *farciéd* mare was bred from, and the mare survived; but the foal exhibited symptoms of *farey*, and died.

These cases are congenital; but diseases in which the fœtus participates with the mother, owing to their contaminating influence, or their extension throughout her organization, are not, properly speaking, hereditary.

The following case is more to the purpose, related by the late Mr. Robert Reed, Crediton, V. S.:—"I have seen," he says, "a foal born blind, having a lenticular cataract in each eye, from the dam having been put to a stallion with a cataract in each eye, the result of a constitutional inflammation."

Thus horses most disposed to *spavins* are those possessing short pointed hocks, deficient in width and breadth below, and disproportionately small, compared with the upper portion of the joint. Those most disposed to *ring-bones* are horses with upright pasterns and high action; and those most liable to *ossified cartilages* are the heavy draught breeds; so much so that it is not an uncommon case to find the cartilages of the feet of horses of this character changed into bone at four and five years old. The reason of this is evident enough: concussion is easily produced in the joints of the character of horses described; inflammation of a slow chronic kind follows as a natural consequence, and osseous effusion is the result.

There is no difficulty in establishing the hereditary character of those diseases. Taking *spavin* as an example, we have numerous and unquestionable cases to produce. Some ten or dozen years since a *spavined* thorough-bred stallion served mares in the neighbourhood of Truro, and in a few years afterwards it was really astonishing to see the number of his stock that were similarly diseased. One striking circumstance connected with this horse is much to the purpose. A half-bred mare, one of his stock, exhibited *spavins* at four years old, and becoming unfit for fast work, was kept for breeding purposes and occasional work on the farm. Two of this mare's stock also exhibited *spavins* in a short time after the breaking.

There is a curious case recorded in the "*Veterinarian*," by Mr. Percivall, of a thorough-bred horse called "*Dominie Sampson*," that had run very successfully on the English turf, and although fired in both hocks, was inconsiderately purchased for the East India Company, and sent out as a covering stallion to the stud at *Buxar*, where for four years he had forty mares annually, and the whole of which generally proved with foal, but were affected either with *curbs* or *spavins*, and only *one* of his stock was passed into the cavalry; consequently he was discarded from the stud.

(*b*) *Curbs* are frequently found in horses exhibiting the character of hock described in the last example, and are generally caused by injury of the annular ligament from over exertion, producing swelling and inflammation about three inches below the point of the hock formed by the *os calcis*. The peculiar form of this bone appears to be connected with the cause of the disease. Its chief purpose is to act as a lever for the action of very powerful muscles, the tendons of which are inserted into its extremity, and in proportion to the projection of this bone will the muscular energy be increased by which the joint is moved. On this account, its length is a matter of considerable importance. It is supposed also to assist indirectly

in supporting the superincumbent weight with the other bones of the hock, and materially assists in preserving these parts from the effects of concussion. But when the os calcis is short, forming a short pointed hock, the leverage or mechanical power is injuriously diminished, leaving too much for the other parts of the joint to perform, and concussion is the common consequence, followed by inflammation and lameness, sometimes connected with *curbs*, at other times *spavins* or *thorough pins*; and it is not an uncommon case to see all three of these diseases in the hock at one time. There are other formed hocks, which are even more disposed to curbs than the one just mentioned; such are the "sickle-hock," or "cow-hock."

We can scarcely name any disease of the horse which affords stronger evidence of a hereditary tendency derived from peculiarity of structure than the one we have been considering. We have also some interesting examples of disease in the feet, arising from faulty and peculiar conformation.

(c.) *Diseases of the Feet*.—Most persons acquainted with the feet of horses will recognise their strong tendency to disease arising from faulty formation. Sometimes the hoofs are disproportionate to the frame—they may be too small, without sufficient base to support the superincumbent weight—rendering the footing insecure; or too large and unwieldy, rendering the action slow and awkward. At other times the crust of the hoof is naturally weak, arising from a faulty secretion of horn. Such hoofs are generally uneven, indented, and wrinkled, and have invariably flattened soles, with a disposition to become *pumiced*. Again, we occasionally find the crust morbidly dry and brittle, arising from the absence of that peculiar tough and elastic horny material which consolidates and binds, in perfectly formed hoofs, the longitudinal fibres of the crust together. Feet of this character are particularly disposed to *sanderacks*. All these defects we have been describing in horses' feet are found to exist not only in different but in the same breed, and are most certainly propagated in breeding.

The *Navicular Disease* is another striking example of hereditary disease to which horses are liable, arising from peculiarity of structure. Those most disposed to it have slender bodies, low action, strong upright hoofs, narrow heels, and great concavity of soles. Lameness is soon produced in horses of this description, when the hereditary tendency exists, from exciting agents of various kinds, such as exposure to heated, fermented litter, imperfect shoeing, fast road-work; whilst animals free of this hereditary proclivity are capable of withstanding all these influences.

The contraction usually seen in diseased feet of

this kind is perhaps more commonly the consequence than the cause of the lameness; but sometimes it may act as a predisposing agent—the former in cases when inflammation precedes the contraction, the latter when a manifest alteration in the form of the foot precedes the lameness. Hence, breeders should at all times look with very considerable suspicion on a stallion exhibiting narrow, contracted, upright hoofs; for although we may occasionally observe old horses, having contracted feet and otherwise out of shape, performing their work without lameness, yet such horses should be invariably avoided in breeding.

Mr. Thomas Turner, V.S., Croydon, related an interesting case respecting the hereditary nature of the navicular disease, at a meeting of the Veterinary Medical Association,* well worth mentioning here—that of a colt bred by himself, which became lame from this disease at four years old. Both the sire and dam of the colt had narrow, contracted feet; and the mare, becoming unfitted for work, was destroyed. On dissecting the foot which exhibited the greatest amount of disease, he discovered a hole in the navicular bone; and, strange as it may appear, the colt's lameness existed in the corresponding foot; and, what appears still more curious, the dam had a rat-tail, and the colt had a fac-simile of it.

In the examples given we have positive evidence of diseased action arising from peculiarity of structure, and transmissible by descent. The breeder may learn a useful lesson from them—that, in selecting horses to breed from, it is not enough to direct his attention to pedigree chiefly, but should be also guided in his judgment by external conformation. The animal machine may be put in motion by the noblest blood; but unless every bone has its just proportion, every muscle its proper pulley, and every lever its due length and arrangement, the motion can never be accurate, vigorous, and durable.

We will next direct our attention to some *important diseases of the internal parts of the body, depending on something defective or ill-balanced in the organization*. On the first view it might appear that such deviations were less extensive than those of outward conformation; but there is reason to believe that they occur far more frequently than is generally imagined. Dr. Holland says, "that there is scarcely any organ of importance which does not afford evidence of diseased actions, derived from structure, and transmissible by descent. On looking to the textures more widely diffused through the body—as the different vascular systems, the nerves, &c.—we have every reason to

* See Trans., January 20, 1830.

suppose, though the proof be less direct, that they are subject to hereditary variations of structure, not merely in detached parts of each system, but throughout those minute branches and terminations where the most important functions of the body, both animal and vital, must be presumed to take place." *

The Diseases of the Respiratory Organs will afford some interesting examples, both in horses and cattle.

(d.) *Roaring*.—So called from a peculiar sound uttered by the horse when his respiratory actions are violently excited. Mechanical injury to the larynx, and the windpipe just beneath it, arising from improper use of the bearing-rein—or tight-reining, so commonly practised in the breaking of young horses—are frequent causes. Sometimes this disease makes its appearance independent of any of those uncalled-for mischievous acts—such as the result of catarrh, or some sub-acute inflammatory affection, causing a thickening of the lining membrane of the upper portion of the windpipe; and, at other times, roaring is produced without any apparent cause whatever; in which case the disease is attributable to *atrophy* of the muscles of the larynx.

Without further considering the causes of roaring, this fact is clear and evident enough, that its hereditary character is very frequently exhibited. Instances are numerous everywhere of stallions affected in this manner, causing the same in their offspring. Mr. Simonds, in his lecture to the members of the Royal Agricultural Society at York, referred to the circumstance of the large proportion of roarers found amongst the Yorkshire horses, which he attributed to hereditary predisposition; and we had an opportunity, in consequence of an official appointment as Judge of the horses at that meeting, of testing the truth of this assertion.

(e.) *Broken Wind* is another example of diseased action derived from abnormal structure, and transmissible by descent. This is a disease perhaps not generally considered as having an hereditary origin. It is caused by disordered functions of the lungs, and is common to horses of sluggish temperaments and slow action; also to carriage and hackney horses, whose work is irregular, and, from mismanagement, their exercise not sufficiently attended to. On the contrary, it is seldom or never seen in the racing stable, and rarely in the hunting stable, where the work or exercise, and feeding department, is properly conducted. Why is this? Because the condition necessary to preserve the healthy functions of the lungs are fulfilled in the latter instance,

and not in the former. One of the chief conditions necessary to this end is exercise. It is this only which will promote perfectly free expansion of the chest, so that the air may have free and frequent access to the air cells; by which not only the muscular functions of the lungs, but other parts of the body, are alike preserved in healthy activity. In the absence of this, the textures of the lungs become flaccid and weak, and lose their healthy resiliency and contractile power. Under these conditions, in fact, they become gradually *atrophied*, which is the essence of the disease known as "broken wind."

The healthy vigour of all the functions of the body is best maintained by their equal and moderate exercise. The muscular function, and with it the circulation of the blood, is the first to suffer from the want of it: hence, first sluggish movements, and ultimately weakness of the heart and other muscles—causing deficient and disordered secretions, general plethora, over-nourishment of adipose textures, and wasting of muscles; and various evil consequences of these morbid conditions may result from these causes when long in operation—such as biliary derangement, indigestion, and flatulency. The emphysematous state of the lungs, usually observed in dissecting broken-winded horses, is undoubtedly induced from disordered secretion, and not by any mechanical rupture of the air-cells, as is commonly imagined.

In the view we have taken of this disease, called "broken wind," the organs of respiration closely resemble the muscles and other organized parts of the body. They were made to be used, and if left in partial inactivity their natural elasticity and power, or tone, are unavoidably impaired. But the mischief does not stop here. It is a very common practice with farmers to breed from broken-winded mares, and the progeny, in a great many instances, inherit a tendency to the disease, because their lungs are never normally developed like those of sound active animals.

The foregoing examples are mostly diseases of structure; we will now consider others where the blood may be considered as taking a part in hereditary transmission.

II. (a.) *Tubercular Phthisis*, or consumption in cattle, will afford an interesting case of this sort; and, although presumably a structural disease, yet it is one that is evidently produced from a vitiated state of the blood, arising either from defective food or from living in a contaminated atmosphere. From either of these causes, the blood is rendered unfit for adequate nutrition, and the lungs become diseased from the deposition of tubercles on its surface in consequence. These deposits are much more commonly produced in cattle than is generally imagined. During the early periods of life

* Medical Notes and Reflections, by Henry Holland, M.D., F.R.S., &c.

the vital principle of stock of this description is but too frequently taxed by resistance required to be made against cold, wet, and insufficient food, causing malnutrition. The organic materials of the body are not persistent, but are more or less prone to decay, becoming effete or worn out in a limited period of time. But in the healthy body there is a reparatory process continually countervailing this decay, by the deposition of new materials whose vital affinities are energetic and able to maintain the integrity of the textures. This renewal depends on the supply of healthy chyle to the living structures, and, if it be defective in quantity or quality, mal-nutrition takes place, and the fibrine of the blood, instead of acting as a plastic material for renewing the worn-out parts, becomes a source of tubercles, and the lungs speedily suffer, and that oftentimes to a considerable extent.

Breeders of cattle may rest assured that the offspring of a consumptive cow is almost certain to inherit a disposition to the disease, and, when this is the case, it is quickly induced by any cause that may reduce the healthy vigour of the system, such as exposure to cold and wet, causing congestions and chronic inflammations—or, as previously stated, from being insufficiently fed.

It is a question, too, well worth considering, whether this tuberculous predisposition may not be frequently induced *in embryo*, from the neglect of the necessary conditions required for the healthy support of the cow. Sir James Clark has directed the attention of the public to this circumstance. He says, "that a state of impaired health of the mother, whether constitutional or acquired, and particularly if caused by imperfect digestion and assimilation, is as productive of a tendency to scrofula and consumption in the children as if it had descended by hereditary transmission."

(b.) The tubercular disease in horses is not near so common as in cattle. In young horses it is sometimes induced by imperfect and insufficient food, rapid growth, and exposure to the vicissitudes of the weather. The mesenteric glands and mucous follicles of the small intestines are most generally affected in these cases, becoming enlarged and filled with purulent and tubercular matters; but in old horses the lungs are the parts chiefly attacked, the symptoms assuming a glanderous character, such as nasal discharge, short cough, defective appetite, and general loss of condition.

The next example is a disease of a scrofulous character, and, like unto the previous one, is evidently produced from a vitiated state of the blood.

(c.) *Schirrous Tumours in Cattle*.—These tumours are generally seen in working oxen and

bulls, old or full-grown. They make their appearance without any apparent pain or constitutional disturbance; at first confined to the thyroid glands, and finally attack the submaxillary and parotid. The disease is known to the farmers in the West of England under the name of *choke-ill*, as in the latter stages of the complaint there is great difficulty of swallowing experienced, arising from the roots of the tongue and the throat becoming affected. When these symptoms appear the animal quickly dies.

A section of one of these tumours displays several abscesses, containing purulent and sometimes fœtid matters, enclosed in fibro-cartilaginous cysts, and which never discharge themselves like unto healthy phlegmonous abscesses. Our case-book furnishes us with the history of many instances of the disease, proving unquestionably its hereditary character.

The last two examples of hereditary disease are of a scrofulous character, and are recognized as constitutional disorders, continued from one generation to another, through the medium of the blood. However difficult it may be to imagine or conceive a fluid like the blood, ever in motion and change, being capable of hereditary taint, yet is it not really more difficult to understand than a character or peculiarity conveyed by descent to any part of the solids of the body.* Such is Dr. Hol-

* Of the instances given of the blood concerned in transmitting hereditary taint, it will be remarked that they are perfectly in accordance with the transmission of hereditary likeness, occasionally observed in breeding, and which is also even more difficult to conceive or imagine. We allude to the curious statement lately brought forward by Mr. J. McGillivray, of Huntly, V.S., that when a pure animal of any breed has been pregnant to an animal of a different breed, such pregnant animal is a cross ever after, the purity of her blood being contaminated in consequence of her connexion with the foreign animal. The two following (for further example read Dr. Harvey's pamphlet on "Cross Breeding") cases may serve as examples:—

"A pure Aberdeenshire heifer was served with a pure Teeswater bull, by which she had a *first cross calf*. The following season the same cow was served with a pure Aberdeenshire bull; the produce was a *crossed calf*, which, when two years old, had short-horns, the parents being both *polled*."

Again, "A pure Aberdeenshire cow was served, in 1845, with a cross-bull, that is to say, an animal produced between a first-cross cow and a pure Teeswater bull. To this bull she had a cross-calf. Next season she was served with a pure Aberdeenshire bull; the produce was quite a cross in shape and colour."

The following striking example occurred in Cornwall:—A half-bred mare, the property of Mr. Blamey, Caraglose, in the parish of Veryan, strayed from the field, and was served by a donkey: the produce was a mule. The following year the mare was taken more care of, and was served by a half-bred horse, yet the progeny bore a strong likeness to the previous mule, in the reproduction of the upright mane, marks, and even colour and form.

land's opinion:—"The blood," he says, "has vitality in every sense in which we can assign it to the solids, and, under some views, it is the portion of the animal frame which is especially so endowed. Its first appearance in the *area vasculosa* of the germinal membrane of the embryo is prior to the existence of those very organs which, after birth, chiefly minister fresh materials to it; and, though undergoing constant change, it has this in common with the animal solids, and with those equally which are most frequently the subjects of hereditary affection."

Our next example involves a similar question, and is an instance of a disease that can scarcely be conceived in any other manner than as circulating in the blood, and conveyed to different parts or organs of the body.

(d.) *Rheumatism in Cattle*.—There is much that is curious in the tendency to rheumatic affections so frequently observed in the ligaments and synovial membranes of the joints of cattle, and likewise in the fascia or cellular coat of the muscles. This disease is attended by stiffness and inability to move, pain on pressure, and more or less febrile symptoms. Sometimes it attacks one or two joints, and occasionally shifts its action to the others. This tendency of the disease to shift from one part to another is evidence of constitutional affection, and dependent on temperament and state of the circulating fluids.

Among the causes which predispose to rheumatism must be placed an hereditary tendency and

Is this not a striking lesson to breeders who are in the habit of putting their heifers the first time to any mongrel bull, not being aware that the purity of her second stock would be contaminated by the first connexion?

The explanation offered by Mr. McGillivray of the phenomenon is ingenious, and consistent with acknowledged facts in physiology.

"By the formation of the after-birth (*placenta*) a connexion is established between the mother and the living creature (*fetus*) in her womb, through which the latter is continually drawing supplies from the mother's blood, for its growth and maintenance. But there are good grounds for believing that, through the same channel, the mother is as constantly (though, doubtless, in much less quantity) abstracting materials from the blood of the fetus. Now, is it at all unreasonable to suppose that the materials in question may be charged with (or have inherent in them) the constitutional qualities of the fetus, and that passing into the body of the mother, and mixing there with the general mass of her blood, they may impart those qualities to her system?"

The qualities referred to must *in part* be derived by the fetus from its male parent, and be to that extent identical with his. The *distinctive peculiarities*, therefore, of that parent may thus come to be engrafted on the mother, or to attach in some way to her system; and if so, what more likely than that they should be *communicated* by her to any offspring she may afterwards have by other males?

temperament of the animal, for, although we find it prevalent in cold, marshy districts, in exposed places, and during the spring and autumn months, when there is the greatest vicissitude of heat and cold, yet why the same agents* should produce rheumatism in one case, bronchitis in another, pleurisy in a third, and dysentery in a fourth, and so on, can only be explained by supposing that each individual has some particular organ or organs which are more prone to disease than other parts of its organization.

(e.) *Chronic Dysentery*.—There appears a strong tendency in cattle to take on this disease. A scanty allowance, with exposure to cold or wet, or anything else that may disturb the balance of the circulation, will induce it when the hereditary predisposition exists. Mr. Youatt was of opinion that the practice of breeding from the nearest affinities induced this disease, and cites, as an example, that of the *Dishley long-horned breed* of cattle, which were notoriously bred in this manner, not only by Bakewell, the originator of the breed, but also by his successors, and they were so highly disposed to dysentery that it proved the element of their destruction. That the breeding too far, and too incautiously, "in-and-in," will produce a weakness of constitution that predisposes to dysentery is very probable. A delicacy of temperament and form, with a tendency to arrive quickly to maturity of bone and muscle, is attained by breeding in this manner; but with these valuable properties a weakness of constitution is engendered, that renders the cattle less hardy, and less capable of withstanding irregularities of living and exposure to vicissitudes of weather.

A question presents itself here with reference to "in-and-in" breeding, that, in such instances, whatever hereditary tendency to disease might exist, is certain to be developed in the progeny in its most marked and aggravated forms; and on the same principle will cross-breeding tend to reduce, or, may be, remove the disposition altogether.

* M. Dupuy relates some cases in proof of glanders being hereditary: "A mare," says he, "on dissection, exhibited every appearance of glanders: her filly, who resembled her in form as well as her vicious propensities, died glandered at six years old. A second and a third mare and their foals presented the same fatal proof that glanders is hereditary."

It must be obvious that all *causes*, as well as the *effects* they produce, must have an intimate relation to the condition of the living frame; and that those which might be quite inefficient on one animal will be more powerfully active on another, owing to the state of vital energy at the time. The effects produced by various animal and vegetable exhalations on different horses fully illustrate this position, producing glanders in some, farcy in others, and grease and ophthalmia in very many.

The next examples of hereditary tendency to disease, and the last we shall adduce, are those connected with the eyes of horses and cattle. They also very probably depend on some peculiar state of the blood, involving the same question as gout in the human subject, though perhaps more dependent on occasional exciting causes from without.

(f.) *Constitutional Ophthalmia in Horses*, a disease of a peculiar inflammatory character, showing itself at intervals, and especially at a certain period of life—generally from three to five years old. When the hereditary proclivity exists, it is easily excited by miasms arising from crowded, dirty, and imperfectly ventilated stables. Our case-book and memory furnish us with some scores of cases in proof of this. One of these is connected with a horse called "Katerfelto," that served mares in this district some thirty years since. He was a favourite stallion with the farmers, and got a very extensive and, with the exception of the strong constitutional tendency to specific ophthalmia, an excellent stock. Notwithstanding so many years have elapsed, yet the disease could be accurately traced from him to his descendants, handed down through the female line, some ten years since.

(g.) *Specific Ophthalmia in Cattle* is not so common a disease as with the horse, but it has the same periodical character, and will disappear and return until it reaches its natural termination—blindness. The constitutional nature of the disease being once correctly ascertained, the farmers usually fatten the cattle for the butcher, or at least they should do so, as its hereditary character is as certain as it is in the horse.

(h.) *Gutta Serena*, commonly known as the "glass eye," is a disease characterised by a preternaturally dilated and motionless pupil, the consequence of palsy of the optic nerve, or of the *retina*. It is fortunately a disease of rare occurrence, and is supposed to be produced by determination of blood to the head. But cases sometimes occur in which there is no discernible cerebral affection. A case of this kind happened to a horse of our own, and on making inquiries some time after of the breeder, the dam was acknowledged to be similarly affected. Mr. Baker, V.S., of Reigate, alludes to a case in the "Veterinarian" of a foal which was born with gutta serena; and on making the necessary inquiries, the mare's eyes were found perfect, but the sire was proved to be thus diseased; and, what was still more worthy of remark, not one of his colts escaped imperfect vision.

Connected with the subject of constitutional ophthalmia, instances sometimes occur where the disease has been lost in one generation and makes its appearance in another. This was remarkably so in the case just recorded of the "Katerfelto" stock,

The gout in the human subject will at once occur as a familiar example of this singular variety in the general law of the perpetuation of the species. The breeder sometimes meets with analogous cases in the striking and strongly-marked features of an animal, lost in one generation, and re-appearing in the second or third.

Connected with this singular anomaly is another variety observed in the transmission of disease—that of a number of the offspring being affected in common with some particular disease, of which there has been no certain instance on the side of either parent.

Instances of this kind can be adduced with respect to *curbs* and *spavins*. A thorough-bred horse, "Royal William," served mares in Cornwall for some five or six years. He was a large, powerful horse for a "thorough-bred," and was perfectly free from curbs. We have examined more than a hundred of his stock, and believe that seventy-five per cent. had curbs, varying from three years old and upwards. This horse, getting out of repute in consequence, was sent to Australia, and we understand that there, as in England, he got a curby race.

Mr. Cartlidge, V. S., stated at a meeting of the Veterinary Medical Association a short time since, that a thorough-bred stallion called Fifty-Three begot foals in his locality, and of these no less than twenty-six became afflicted with curbs before they were twelve months old, and yet this horse had no symptom of the disease. At the same meeting Mr. Varnall, V. S., stated that an entire horse called Monarch had served mares in the county of Norfolk for some years, and on his colts being broken—some at three, and others at four years old—the majority were affected with spavins, splints, and ring-bones, yet he himself was entirely free from any of these diseases.

These curious exceptions to the law by which hereditary diseases are supposed to be governed may be referred to the condition last mentioned, of the revival of a hereditary likeness absent in one or more generations, and familiarly known to breeders under the term "breeding back." The explanation may not be considered a satisfactory one, for it must be confessed that we have but very obscure notions of some of the laws which regulate variation in animals. That such laws do exist appears highly probable from the numerous instances of the constant recurrence of similar phenomena under given circumstances, which seem to preclude their dependence upon mere accident, and the most striking one is the law which governs the extent to which variation is allowed in the animal economy. There appears to be a limit beyond which change or variety cannot be induced, the original type of the species being ever present, and in constant op-

position to their continued progress. This is particularly observed in instances where great refinement in breeding is practised. When the stock has been got up to what is commonly considered the highest perfection, a tendency to degenerate, or transmit backwards to the original standard, is sometimes observed, and the greatest difficulty is experienced in combating against this inherent property. Many a breeder can certify to this, that the nearer he approaches perfection in breeding, the greater is the danger of retrograding. But that which is considered perfection with reference to man, such as early ripeness of bone and muscle, with disposition to acquire fat—qualities which eminently characterize our high-bred flocks and herds—are, after all, but a state of degradation with reference to nature, since these extraordinary characteristics could never arise or be perpetuated in a wild state, under any imaginable combination of accidents.

It will be unnecessary to point out to the agriculturist the important practical relations which the subject of hereditary disease bears to his pursuits, it being one that cannot fail to enter as an element in his estimate of the purity and value of an animal's breed, and to form an object of special regard in the breeding of stock. It will prove to him, also, that breeding is not so dependent entirely on chance as many persons believe. Events may, and doubtless will, arise to baffle human foresight; but even these will serve as beacons for future guidance, if but fairly considered and understood. Discrepancies of this character are but too commonly set down as the caprice of nature, which may oftentimes be easily accounted for, if such persons will take the trouble to search and examine for themselves. As a golden rule in breeding, the old Yorkshire adage, that "like produces like," may be safely acted on at all times, and should never be lost sight of by the breeder.

TIMBER OF THE DEODAR.

A great deal of interest has lately been excited among planters and persons interested in the timber trade respecting a new kind of wood which promises, or is said to promise, to be superior to any coniferous wood known, more especially for ship-building. We allude to the Deodar (*Cedrus Deodara*), which was introduced to this country some years ago from the Himalayas, and has since been very extensively planted for ornamental purposes, for which, from its noble and elegant appearance, it is well adapted. It was not supposed, however, that it would be valuable for anything beyond mere ornament; but so much has lately been said in its favour as a timber tree, that it fully deserves the attention of practical men, and their careful investigation into its real merits.

Dr. Royle, the celebrated botanist of the Himalaya mountains, has taken much pains to establish the excellence of the Deodar timber for building purposes, in an official report to the Commissioners of Woods and Forests. He states that it is used in its native habitats for every kind of purpose. Temples, houses, bridges are built of it; and by the mode of building adopted, the wood is equally exposed to the action of the weather with the stone with which it is combined. These buildings are many of them of great antiquity. Dr. Royle has himself seen some which exhibit full proof of having been in existence for many centuries, and the wood is still in a state of the most perfect preservation. He further states that the Deodar is not chosen from necessity, there being many other kinds of

wood equally obtainable, but from conviction, founded on experience, of its superior value. Dr. Royle's testimony is amply confirmed by that of other gentlemen of great experience in India.

But the question arises, would the timber be equally valuable in England? It is of course readily conceivable that a wood might be of great excellence in India which in a climate like our own would be nearly worthless. On this point the evidence is quite satisfactory. The Himalayan climate it appears is very similar to that of north-western Europe. It is extremely valuable, and during a considerable portion of the year cold and moist. So that there is the fullest reason to believe that timber capable of withstanding the vicissitudes of a Himalayan climate would successfully brave those of an English one.

But this does not answer another question of equal importance—would the timber of the Deodar *grown in England* be equal in quality to that *grown in India*? Obviously the answer to this must depend in a great measure on experience; but Dr. Royle argues from the similarity of climate, and the facility with which similar conditions of growth may be obtained, that there is little or no doubt on this point also. That the Deodar is perfectly hardy in this climate under the severest of our winters has been demonstrated. Seeing this is the case, we may not unfairly presume that its timber will attain the same degree of excellence as in its native mountains. An argument to the contrary has been based on the alleged fact that the wood of the

cedar of Lebanon, which is nearly allied to the deodar, does not attain the same excellence, nor anything like it, in this country, which it is said in ancient times to have possessed in Syria. In reply to this, it is answered that there is satisfactory evidence that the cedar-wood of the ancients was not the tree we call "cedar of Lebanon" at all, but a species of juniper; so that the good qualities ascribed to the former in antiquity, contrasted with its alleged worthlessness at present, afford no ground for supposing that its ally, the deodar, would not be equally valuable grown in England as in India.

With a view to extend a knowledge in this country of the real qualities of deodar timber, the East India company have caused several large plants to be imported, one of which was recently exhibited at the meeting of the Horticultural Society in Regent-street. On that occasion, Dr. Royle made some remarks, recapitulating the statements made in his official report on the subject, and, in addition, read a letter from Mr. Wilson Saunders, of Lloyd's, who, in conjunction with two other gentlemen of great ability and experience, had examined the wood, to ascertain its fitness for naval purposes. Mr. Saunders states his full conviction that it will be found superior to any of the coniferous woods. He considers it ought to rank higher than the larch, in proof of the value of which he mentioned that 20,000 tons of shipping are now building in North America, of that timber alone. It was his opinion, therefore, that its growth should be encouraged as much as possible.

Dr. Lindley, who has given much attention to the subject, and is no mean authority, expresses his entire concurrence in the views of Dr. Royle, and added an interesting refutation of the argument against the goodness of the deodar grown in England, founded on the asserted worthlessness of the home-grown cedar-wood. He exhibited a specimen cut from one of the cedars on Mount Lebanon eight years ago, side by side with a piece cut from the gardens of Chiswick House, between which no difference of appearance or quality could be detected.

With regard to the plank of deodar exhibited, it was some fifteen feet in length, by four or five feet in breadth. A portion had been planed, to show the grain; the remainder being left in its rough state. The wood is almost more like common yellow deal in appearance than cedar; its fragrance is much like the latter, but very much more powerful; and it contains, evidently, a great deal more of resinous matter.

The Commissioners of Woods and Forests have imported a large quantity of seed, and intend introducing the deodar very extensively in the royal

demesnes. Individual experiments should be made, as well as national ones. There is every encouragement to planters of enterprise to make such experiments; and, as plants are now easily procurable, they may set about it at once. The conditions essential to successful growth, according to Dr. Royle, are an exposed situation, free drainage, and a rather slow supply of nutriment. In situations affording these requisites, there is little doubt that the deodar may be cultivated with the fullest prospect of success. J.

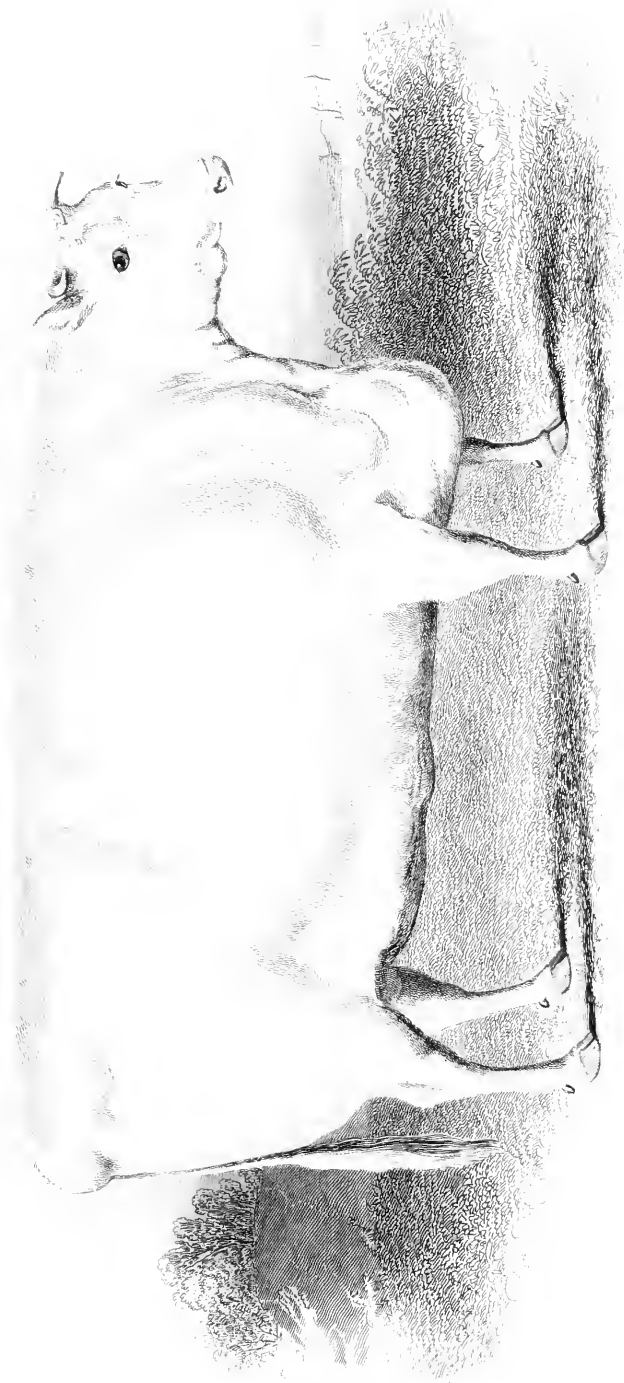
THE POTATO CROP.

SIR,—I shall feel much obliged for the insertion of the following new way of treating the crop of potatoes. When the haulm gets cut down by the frost, as in the case of last week, it is a well-known fact that every dormant eye in the set, as well as in the joints underground, send up a large number of shoots, the produce of which, when all are allowed to remain, is an over-crowded state of the haulm, and an inferior small-sized crop of tubers. But if the following plan is adopted, which I discovered five years ago, and have practised with every success, it well repays for the little trouble: it is simply this—that as soon as all the shoots come above ground a second time, let the work people go over each row and pull up all the weakest, leaving only two or three of the strongest shoots. This simple plan places the crop in as good a state as before the frost, only the crop is thrown about fourteen days later by having been cut down. Perhaps thinning out with the hoe in a large field would do as well; it would be more expeditious. I am, Sir, your very much obliged servant,

Camberwell.

JAMES CUTHILL.

A HINT TO FARMERS.—(From a Correspondent.)—Flax has gone up in the market from £35 to £75 per ton. While there is time, I would call the attention of farmers to the question whether at such a price it would not be profitable to grow flax. The time of sowing is from the middle of April to the beginning of May, so that there is not a day to be lost by those who have a favourable soil, which is sandy loam containing vegetable earth, or old meadow land. In Ireland our fellow-countrymen are quite alive to the subject, and the quantity sown this year is double what it had previously been. The seed best adapted is Riga: in buying, select it plump, shining, and heavy. "The proportion of seed is three and a-half imperial bushels to the Irish acre. It is better to sow too thick than too thin, as with thick sowing the stem grows tall and straight, with only one or two seed capsules on the top, and the fibre is found greatly superior in fineness and length to that produced from thin sown flax, which grows coarse and branches out, producing much seed, but an inferior quality fibre." I have taken the extract, given in inverted commas, from a valuable little work, called "The Theory and Practice of Modern Agriculture," by Andrew Corrihan, curate to the Royal Dublin Society, and which I strongly recommend to our agricultural readers; it contains much and valuable information, given in a simple and concise style, but in a truly plain and practical manner.



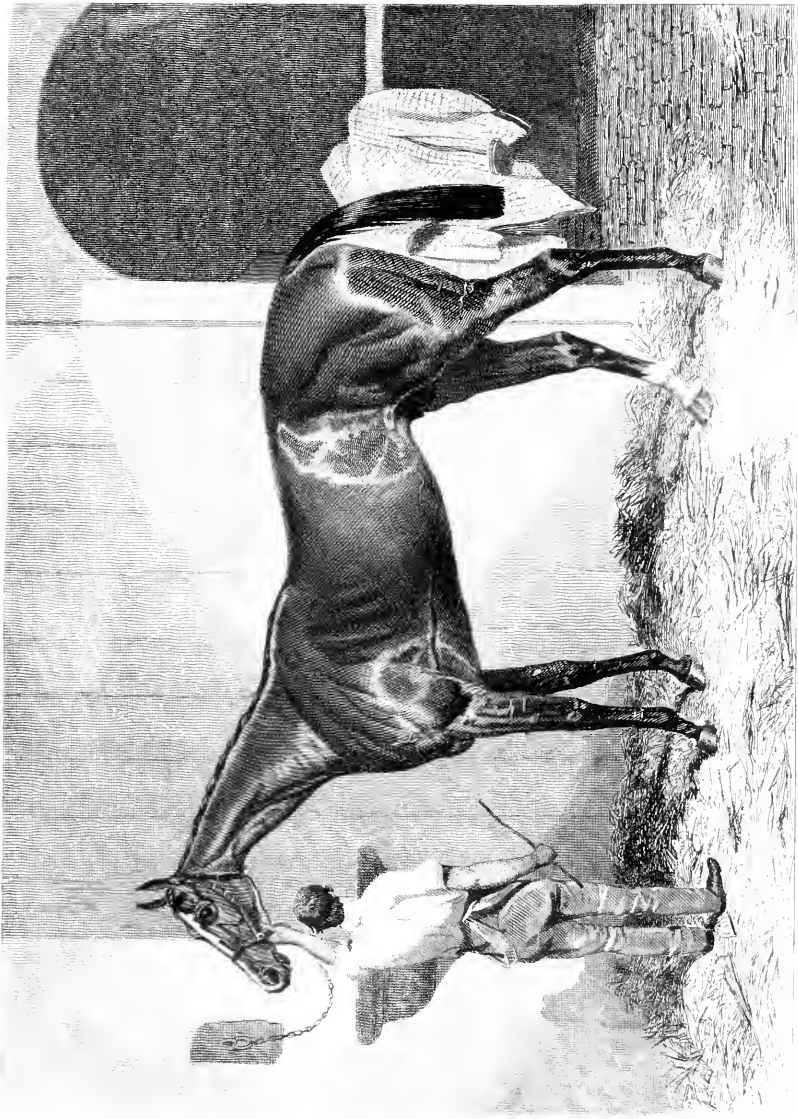


PLATE I.

SHORT-HORNED HEIFER.

The subject of our plate was the property of Mr. Ambler, of Watkinson Hall farm, near Halifax. The following is her pedigree:—Miss Francis, white, calved December 31, 1849; got by Laudable (9282), dam (Fair Francis) by Sir Thomas Fairfax (5196), g. d. (Feldom) by Young Colling (1843), gr. g. d. (Lily) by The Red Bull (2838), gr. gr. g. d. by a son of Hollings (2131), gr. gr. gr. g. d. by Partner (2409), gr. gr. gr. g. d. by Mr. R. Alcock's Bull (19).

The following prizes were obtained by "Miss Francis" in 1850, 1851, 1852, and 1853:—In 1850, at the Yorkshire Agricultural Society's Meeting, held at Thirsk, August 8th, the prize of £10 in class 8, for heifer calves; and at Halifax, August 28th, from the same society, the silver medal. In 1851, at the Royal Agricultural Society's Show, at Windsor, in July, the prize of £10 in class 5, as the best year-old heifer; at the Yorkshire Agricultural Society's Meeting, at Burlington, August 6th, the prize of £10 for yearling heifers; at the Northumberland Agricultural Society's Meeting, August 7th, the prize of £7 in class 12, for heifers calved in 1849; at Halifax, August 27th, the society's silver medal; and again, at Keighley, in September, the society's silver medal; at the Agricultural Society, at Wetherby, September 12th, the prize of £5 in class 6; at the Agricultural Society's Show, at Bury, October 3, the prize of £4 in class 9; and at the South Lancashire Agricultural Society's Meeting, at Manchester, October 7th, the prize of £4 in class 11. In 1852, at the Agricultural Society's Meeting, at Otley, April 5th, the prize of £3 in class 5, as the best two-year-old heifer; and again this year, at Halifax and Keighley, in August, 1852, the silver medals. In 1853, at the Yorkshire Agricultural Society's Meeting, at York, August 3rd, the prize of £5 in class 12, as the best fat cow or heifer of any age; at the Smithfield Club Cattle Show, December 6th, the prize of £5 in class 11, for heifers not exceeding four years old; and at the Birmingham Meeting, December 13th, in class 8, the prize of £10, and the silver medal to the breeder; and the gold medal and extra prize of £20, as the best cow or heifer in the show.

This animal was slaughtered on the 18th of January, 1854, and weighed as follows:—Carcass 1616 lbs., or 202 stone; loose fat 176 lbs., or 22 stone.

PLATE II.

WEST AUSTRALIAN; WINNER OF THE DERBY, 1853.

ENGRAVED BY E. HACKER, FROM A PAINTING BY HARRY HALL.

West Australian, bred by his owner Mr. Bowes, in 1850, was got by Melbourne out of Mowerina, by Touchstone, her dam Emma by Whisker—Gibside Fairy, by Hermes.

West Australian is a good hard yellow bay horse, standing fifteen hands three inches and a-half high. He has a very clean blood-like head, tapering towards the nose; with—like many of the Melbournes—somewhat peculiar ears, long and rounded at the points. He has rather a short, strong, but still elegant neck; good shoulders, well thrown back; with great depth of girth, and very strong and thick through where his jockey's knees come. His back is splendid; and he is ribbed up so that you can barely lay your hand in the space left. He is not very deep from the top of the loin to the stifle, but has capital quarters, with good thighs and hocks, standing perhaps a little long from the hock to the ground. He has not very large arms or knees, but has plenty of bone, with very sound clean-looking legs. He has a thin blood-like tail, with a blaze of white in his face, as well as some white on the near fore coronet, and the off hind fetlock-joint. Summing up his general appearance, we may safely record West Australian as one of the finest specimens of the English race-horse ever seen.

METEOROLOGICAL DIARY

[Omitted in our last Number.]

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEAT'R.
1854.	9 a.m.		Min.	Max.	10 p.m.	Direction.	Force.	10 p.m.			
	in. cts.	in. cts.						8 a.m.	2 p.m.	10 p.m.	
Mar-23	30.41	30.38	41	50	35	Northerly	lively	cloudy	cloudy	fine	dry
24	30.30	30.29	32	50	43	Northerly	calm	cloudy	cloudy	cloudy	dry
25	30.12	29.99	30	46	43	W. and by S.	gentle	cloudy	cloudy	cloudy	dry
26	29.92	30.03	40	50	45	W.N.W.	gentle	cloudy	cloudy	cloudy	rain
27	30.21	30.22	39	56	42	N. by West	gentle	cloudy	fine	fine	dry
28	30.28	30.36	39	58	48	N. West	gentle	cloudy	sun	fine	dry
29	30.39	30.34	36	62	48	S. West	gentle	fine	sun	fine	dry
30	30.34	30.26	40	58	48	W. by North	gentle	fine	sun	fine	dry
31	30.38	30.37	36	62	46	S. West	fresh	cloudy	cloudy	fine	dry
April 1	30.36	30.30	35	69½	53	S. West	fresh	cloudy	sun	clear	dry
2	30.40	30.40	35	70	53	East by South	fresh	fine	sun	cloudy	dry
3	30.45	30.51	43	69	45	Northerly	gentle	clear	sun	fine	dry
4	30.51	30.42	34	64	47	S. by East	gen. air	clear	sun	clear	dry
5	30.42	30.41	41	67	48	W. and by N.	gentle	fine	sun	fine	dry
6	30.40	30.33	37	65	53	Westerly	fresh	clear	sun	clear	dry
7	30.38	30.35	37	70	50	North, var.	gentle	fine	sun	clear	dry
8	30.30	30.12	42	72	50	S. West	var.	fine	sun	clear	dry
9	30.12	30.20	38	65	47	N. East	lively	fine	sun	clear	dry
10	30.20	30.19	39	55	—	E.N.E.	lively	cloudy	sun	clear	dry
11	30.12	30.12	39	69	48	E.N.E.	lively	fine	sun	clear	dry
12	30.30	30.31	40½	63	49	E.N.E.	lively	cloudy	sun	cloudy	dry
13	30.33	30.29	45	61	47	E.N.E.	lively	cloudy	sun	fine	dry
14	30.20	30.13	37	65	49	E.N.E.	fresh	clear	sun	clear	dry
15	30.05	30.01	39	62	50	East by South	calm	cloudy	sun	fine	dry
16	30.09	30.20	35	66	52	E. by North	lively	clear	sun	cloudy	dry
17	30.23	30.22	42	52	42	N. East	lively	cloudy	sun	clear	dry
18	30.16	30.08	37	74	49	N. East	var.	clear	sun	clear	dry
19	30.01	29.91	44	78	35	S.S.E.	lively	clear	sun	clear	dry
20	29.82	29.64	46	72	57	S.S.E.	gusty	fine	cloudy	cloudy	dry
21	29.52	29.43	54	64	55	Easterly	gentle	fine	cloudy	fine	shower
22	30.43	29.63	49	50	44	E.N.E	strong	cloudy	cloudy	cloudy	wet

ESTIMATED AVERAGES OF APRIL.

Barometer.			Thermometer.		
High.	Low.	Mean.	High.	Low.	Mean.
30.34	29.20	29.881	74	29	49.9

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
62.4	39.4	50.9

WEATHER AND PHENOMENA.

March 23. Gradual clearing; superb sunset.
 24. Hoar frost, early. 25. Cold and overcast.
 26. Two small showers; the last rain of the month; total fall 0.45 of an inch! 27. Smoky atmosphere, clearing. 28. Genial, fine day: a comet noticed.

29. Fine cirrus. 30. Fine, but not clear. 31. Month ends brilliantly.

LUNATION OF MARCH.—New Moon, 28th day, 4 h. 52 m. P.M.

April 1. Very fine, and warm: comet seen at 8 p.m. 2. Magnificent crimson sunset, in motley-grey small masses. From this date one uniform period of splendour and high temperature till the 25th, the averages being far above the usual mean. On that day the surprising, though secret, disturbance of the electricities occurred, which changed all the meteorological phenomena.

LUNATIONS OF APRIL.—First quarter, 5th day, 3h. 22m. P.M.; full moon, 13th day, 5h. 57m. morning; last quarter, 20th day, 11h. 14m. morn.

Croydon.

J. TOWERS.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEATH'R.
1854.	s a.m. in. cts.	10p.m. in. cts.	Min.	Max.	10p.m.	Direction.	Force.	s a.m.	2 p.m.	10p.m.	
Apr. 23	29.83	30.10	38	46	37	North	strong	cloudy	cloudy	cloudy	dry
24	30.26	30.40	32	49	34	North	brisk	fine	sun	fine	snow
25	30.40	30.36	20	52	44	N.E.	var.	fine	sun	fine	dry
26	30.38	30.32	40	51	44	N.W.	gentle	fine	sun	fine	dry
27	30.02	29.83	43	52	43	W. and N.	gentle	cloudy	cloudy	fine	showery
28	29.83	29.88	39	50½	45	N. by East	gentle	cloudy	cloudy	fine	dry
29	29.66	29.70	40	52	43	N. by East	cloudy	cloudy	cloudy	cloudy	rain
30	29.60	29.40	37	50	49	W.S.W.	fresh	cloudy	cloudy	cloudy	showery
May 1	29.22	29.20	47	55	46	S. Westerly	fresh	cloudy	cloudy	cloudy	rain
2	29.20	29.40	44	58	48	S. Westerly	strong	cloudy	sun	fine	dry
3	29.45	29.51	48	54	43	S. Westerly	lively	cloudy	cloudy	fine	showery
4	29.60	29.66	44	62	48	S. Westerly	gentle	fine	sun	fine	dry
5	29.69	29.69	38	55	48	W. by South	var.	fine	cloudy	fine	dry
6	29.64	29.56	42	57	50	S. by West	gentle	fine	cloudy	fine	dry
7	29.59	29.56	45	61	51½	S. West	strong	cloudy	fine	cloudy	showers
8	29.50	29.56	45	58	43	S. West	brisk	fine	cloudy	fine	showers
9	29.68	29.87	39	58	43	S.W. & N.W.	var.	fine	cloudy	fine	hail shws.
10	30.04	30.00	39	60	47	S. East	gentle	fine	sun	fine	dry
11	29.96	30.07	44	58	46	S. West	gentle	cloudy	fine	fine	dry
12	30.19	30.15	37	62	49	W. and by N.	gentle	cloudy	sun	fine	dry
13	30.16	30.10	46	61	54	Northerly	calm	cloudy	fine	cloudy	dry
14	30.15	30.14	44	66	54	Easterly	gentle	fine	sun	cloudy	dry
15	30.13	30.10	48	68	49	East by N.	gentle	fine	sun	fine	dry
16	30.14	30.15	46	62	46	N. East	lively	fine	sun	clear	dry
17	30.16	30.07	37	70	53	E. and S.E.	gentle	fine	sun	fine	dry
18	30.07	30.16	46	52	44	N. to N.E.	gentle	cloudy	cloudy	fine	rain
19	30.20	30.20	34	68	48	E.N.E.	gentle	fine	sun	fine	dry
20	30.21	30.06	39	68	52	W., W. by S.	gentle	clear	sun	fine	dry
21	29.94	29.79	42	62	53	S. West	brisk	cloudy	sun	fine	showery
22	29.63	29.55	48	62	53	S.S.W.	brisk	cloudy	fine	cloudy	rain

ESTIMATED AVERAGES OF MAY.

Barometer.			Thermometer.		
High.	Low.	Mean.	High.	Low.	Mean.
30.38	29.160	29.898	70	33	34

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
53.106	41.20	49.65

WEATHER AND PHENOMENA.

April 23. Penetrating cold. 24. Still more so. 25. Destructive frost in the early morning. 26. More genial. 27. Overcast, after a copious driving shower. 28. Overcast. 29. A morning sprinkle. 30. Fine growing showers.

LUNATION.—New Moon, 27th day, 6 h. 14 m. morning.

May 1. Much rain. 2. Clearing, and more genial. 3. Two spring showers. 4. Dark masses in the south. 5. No rain here; showers about. 6. Airy, fine day. 7. Violent gusts; a small shower. 8. Brisk showers; a superb double-coloured rainbow. 9. Fine forenoon; then thunder, hail, and heavy rain. 10, 11, 12 and 13. Balmly, sweet air. 14. Dry, and cloudy. 15 and

16. Beautiful northern aurora set in; no real night. 17. Summer weather. 18. Cold transition. 19. Rapid increase of heat. 20. Sweet, soft day. 21. Showers; and in the night. 22. Rain, early; wet night.

LUNATIONS OF MAY.—First quarter, 5th day, 9 h. 30 m. morn; full moon, 12th day, 3 h. 36 m. afternoon; last quarter, 19th day, 6 h. 33 m. morn.

REMARKS CONNECTED WITH AGRICULTURE.—The crops since the equinox have made a steady, quiet progress, and are now beautiful to behold—wheat, barley, oats, and meadow and artificial grasses; but fruit trees have suffered much, and arbitrarily. Forest trees the same, and most remarkably so the oaks and ashes; the former, which had kept steadily in advance of the latter, were cut much, and their young shoots partially destroyed. These, however, are recovering; but the ash trees have lost buds and blossoms, and are all but torpid. Elms seem to have remained safe. In the garden the havoc has been peculiar, and in several instances without precedent.

Croydon, May 22nd.

J. TOWERS.

CALENDAR OF AGRICULTURE.

The month of June introduces the turnip season in right earnest over the greater part of Britain. The land must be well pulverized, all weeds and stones removed, and rolled flat. Open the drills with a bout of the common plough, or one furrow of the double-mould-board plough; lay the dung in the hollows from the one-horse carts, spread and cover it by the plough without delay, and sow the turnip-seed immediately. On cloddy and crumbling soils, roll the drills on the flat ground without delay; it crushes the clods, closes the surface against drought, and acts as a lock and key in retaining the moisture. In dry seasons, this rolling of the sown ground is a valuable part of turnip farming.

Sow Swedish turnips till the end of the month, and then go on with Green Rounds, and lastly sow the White Globes. Sow with the drop-drill all artificial manures, as bones, guano, ashes, bran and rape-dust, and roll immediately. Turnip-sowing should be mostly finished this month. Plough pared and burned lands, on which the ashes are spread, with a thin furrow; harrow it finely with repeated harrowings; sow the turnip-seed by hand, and cover it with a single tine of the grass-seed harrows. In some cases a rolling may be necessary. If the lands are loamy and deep in the staple, work and drill the ground in the usual tilth.

Plough the intervals of the drills; horse and

hand-hoe potatoes, beet, parsnips, and carrots; plough potatoes deeply, especially on stiff soils, and break well the drills with the hoe. Minute care adds much to the success of crops.

Shear sheep, and mark by distinctive signs the different ages and conditions of the animals. Wean the lambs of the year, and put them on the best pastures. Put mares to the stallion regularly.

Cut and destroy all weeds on pastures, pull by hand all tall weeds among grain crops, and destroy all weeds on the sides of roads, ditches, and hedges.

Hay harvest will often commence this month in early seasons. Clovers, sainfoins, and early meadows may be cut; get the crop dried and stacked quickly.

The working and making of hay requires plenty of hands, kind treatment of the labourers, and quickness and despatch in every operation. Allow five or six haymakers to each mower, besides the hands that may be required in the carrying process. The hay-making machines are a very great furtherance in quickly making the grass into a dry condition. In favourable weather, hay may be stacked in 48 hours after being cut, when it has been properly managed by being alternately and repeatedly cocked and turned. In stacking hay, it is better to let it sink and consolidate by its own weight in the stack or rick, than to tread it into solidity, as is usually done.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MAY.

Notwithstanding that the weather of this month has not been very genial, owing to the numerous changes in the temperature, the wheats have made a fair progress towards maturity. Respecting their general appearance, we may observe that our accounts are somewhat satisfactory, although some of our correspondents state that they are rather thin on the ground. The extent of land under wheat culture, this season, is the largest on record; hence, should the season prove favourable, we may look forward to a very large growth. There is one feature which appears to favour this opinion, viz., the unusually small number of instances in which it has been found to re-sow the land, and the limited depredations committed by the slug. In

the early part of the month, barley was suffering from want of moisture; but since the fine rains have fallen, it has rapidly improved in appearance. Oats are looking well, but we regret to assert that both beans and peas have suffered severely from the sharp frosts. In many instances, extensive tracts of land show unmistakable signs of a short crop; consequently, we should not be surprised to find a very limited growth of those articles at harvest time.

In spite of the war with Russia, we have continued to receive large supplies of wheat, flour, and other articles from abroad. The steady imports have had the effect of checking any decided upward movement in prices; but it is evident that our importations must, ere long, fall off, and that great difficulties will be experienced in meeting consump-

tion, because it is clear that the stock of grain at this time in the hands of our farmers is unusually small. The close of the strikes in the manufacturing districts has, no doubt, increased consumption materially, and the great prosperity of trade in general must produce a heavy drain upon our stack-yards, from the fact that our artizans and others are now mostly fully employed. We do not, however, anticipate famine prices; but we are quite convinced that any decided fall in present rates is wholly out of the question—certainly between this and the end of next September.

The present appearance of the fields indicates a good hay crop. The stock of last year's now on hand is small, and, for the most part, in very bad condition. There has, consequently, been a very wide margin between the value of really good and of inferior qualities of both meadow and clover hay.

The value of guano, although the imports of that article have been on a liberal scale, has been well supported. The continental demand has taken off some large quantities, at from £10 10s. to £11 per ton.

We understand that the lambing season has passed off tolerably well. In the leading districts, the fall has been a good one; whilst the prices realized have been higher than for a series of years past. The arrivals in the metropolis have been on a liberal scale, and of full average weight.

The wool trade has been in a very depressed state, and a considerable fall has taken place in the value of English qualities. The sales of colonial are progressing slowly, at a decline in the quotations, compared with the previous auctions, of from 0½d. to 1¼d. per lb. This depression is likely to continue, as it is evident that future imports from Australia—now that labour has become more abundant in that colony—will exceed the demand.

Old potatoes are still coming to hand—a very decided proof that the losses sustained last year were over-estimated. This season, an immense extent of land has been planted with that esculent, in nearly all parts of the United Kingdom, but more especially in Ireland, from whence shipments have been made during the month, and which, we are informed, have paid remarkably well. The imports from the continent have exhibited a material falling off.

A full average business has been transacted in the corn trade, both in Ireland and Scotland, and prices have been well supported. We learn that the stock of oats in the former country is large for the time of year.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The falling off in the imports of foreign stock into the United Kingdom, compared with 1853, to the present time, still continues. The importance of this subject induces us again to refer to it, because it is evident that the future value of home-fed stock must be materially influenced by the ability of the foreign graziers to supply our markets. Evidently the decrease in the import duty in France, and the high value of beasts, sheep, and calves in that country, have tended to divert large supplies from our markets which otherwise would have reached us, and which would have kept prices in check. But, apart from the French demand in Holland and Belgium, we are warranted in saying that the quantity of stock in Holland—arising from the almost incessant drain which has been going on for several years for shipment to England—has become small. In the ordinary state of things a decreased number almost invariably leads to an improvement in quality, weight, and symmetry; but the immense shipments of late years—though efforts have been made in some parts of Holland to give additional age and stamina to the animals—appear to have neutralised all attempts of this kind. All who have had an opportunity of looking at the Dutch stock which has come to hand this year must be of opinion that little or no improvement, in a general way, has taken place in its condition since the passing of the present tariff. Some good and really saleable animals have come to hand; but the primary object of the graziers appears to have been to sell their stock immediately it could be turned into money. This system we conceive to be most impolitic, because it almost invariably leads to a serious drain upon the resources of most farms, and is frequently productive of unfavourable results to the small graziers, who are not unfrequently compelled to pay enormously high prices for store animals, arising from their scarcity. Evidently, we have drained Holland of the principal portion of its surplus stock; and the competition which has sprung up during the last two months on the part of the feeders in France has had the effect of checking shipments to England. We are, therefore, of opinion, that future arrivals will show a further considerable falling off, and that, consequently, the value of English stock will rule high—higher, perhaps, than it does now. In several previous years we have drawn large supplies of beasts from the Danish islands, but this season we may anticipate a great decline in them, arising from the presence of the allied fleets in the Baltic, and the great demand which has thus

sprung up to supply the wants of the navies. Already, the stock destined for our markets has been consumed by the fleets, and a protracted stay in the Baltic may have the effect of stopping the exports to England altogether.

The following are the imports into London during the month:—

	Head.
Beasts	1,348
Sheep	2,229
Lambs	12
Calves	1,109
Pigs	10
Total.....	4,708

In the corresponding month in 1853 the total arrivals amounted to 13,007; in 1852, 8,506; in 1851, 9,214; in 1850, 6,050; in 1849, 5,465; in 1848, 7,904; and in 1847, 6,275 head.

From our own districts the arrivals of beasts and sheep up to Smithfield have been tolerably extensive. Generally speaking the demand has ruled brisk, and prices have advanced to some extent, some prime Scots having sold at 5s., and the best Downs, out of the wool, 4s. 10d. to 5s. per silbs. The total supplies shown have been:—

	Head.
Beasts	20,831
Cows	576
Sheep and lambs	124,824
Calves	2,146
Pigs	2,435

COMPARISON OF SUPPLIES.

	May,	May,	May,	May,
	1850.	1851.	1852.	1853.
Beasts	16,468	19,464	17,839	21,346
Cows	456	460	476	500
Sheep & lambs	128,910	133,362	118,034	122,250
Calves	1,740	1,855	2,393	2,041
Pigs	2,253	2,780	2,655	2,700

Since our last about 10,000 Scots and short-horns have come to hand from Norfolk, Suffolk, Essex, and Cambridgeshire, 2,900 of various breeds from other parts of England, and 1,900 Scots from Scotland, chiefly per railway.

The stock has changed hands on the following terms:—

PER SILBS. TO SINK THE OFFAL.

		s. d.	s. d.
Beef	from	3 2	to 4 10
Mutton		3 4	5 0
Lamb		5 4	6 8
Veal		4 2	5 8
Pork		3 6	4 8

COMPARISON OF PRICES.

	May, 1850.		May, 1851.	
	s. d.	s. d.	s. d.	s. d.
Beef	2 6	to 3 6	2 4	to 3 6
Mutton	2 10	4 0	2 6	4 0
Lamb	4 0	5 4	4 8	5 10
Veal	3 0	3 6	3 0	3 8
Pork	3 2	4 0	2 8	3 8

May, 1852. May, 1853.

	s. d.	s. d.	s. d.	s. d.
Beef	2 4	to 3 10	3 0	to 4 6
Mutton	2 6	3 10	3 4	4 8
Lamb	4 2	5 4	5 0	6 4
Veal	3 0	4 4	3 10	5 0
Pork	2 4	3 6	3 0	4 4

Food has now become scarce in most parts of England; but we may now anticipate a good supply of grass, from the fine rains which have everywhere fallen. On the whole, the beasts have come to hand in fair average condition; but butchers generally have complained that sheep weigh very light.

Newgate and Leadenhall markets have been tolerably well supplied, and a good business has been doing, at higher terms. Beef has realized 3s. to 4s. 4d.; mutton, 3s. 4d. to 4s. 8d.; lamb, 5s. 2d. to 6s. 4d.; veal, 4s. to 5s. 2d.; and pork, 3s. 4d. to 4s. 8d. per silbs. by the carcase.

ESSEX.

We may now fairly be considered to be entering upon summer. The spring from which we are emerging has been one of the most fickle and uncertain temperature that we have for many years experienced. The prevailing dry state of the weather, however, assisted the crops materially to resist the sudden transitions from bright sunshine by day to severe and cutting frosts by night; indeed, in the early part of this month, the severity of the frost has been unexampled during the present century, and seven degrees of frost were registered in this county, but in other districts near London as many as eleven degrees were registered. The consequence has been, that nearly all descriptions of fruit are destroyed; and in many orchards that we have inspected, not a single apple, plum, pear, or cherry will be grown. The wall-fruit has also suffered greatly, and the gooseberries also are mostly destroyed. The effect of frost in gardens differently situated is very great. In all situations near running streams, and consequently in valleys, the severity of it is most apparent; even the early cabbages are in such situations cut down. The oak trees have all their buds destroyed, except upon the tips of the highest branches, and will be almost leafless until after Midsummer. Horse-chestnuts also, in some situations, have nearly all their leaves and shoots destroyed; and most of the tender evergreens and delicate roses are more or less injured, and many of them destroyed. In some fields, in exposed situations, the blade of the barley has the appearance as having been invariably scorched; and the early potatoes were cut down to the surface of the ground. As regards our agricultural crops, we are enabled to report more favourably; but, notwithstanding, the wheat in many instances is thin in plant, and has not generally recovered so much as we were led to expect. Upon the heavy clay land, some pieces look remarkably well; but they are rather the exception than the rule, for, upon close inspection, the deficiency of plant will be found to prevail extensively, and such pieces have not improved to a corresponding extent with those that are full in plant. Upon the mixed loam and tender clay soils, the reverse is the case—the plant is better, and the progress and appearance are in most instances all that can be desired; but upon the gravel and thin sandy soils, the appearance at one period was sickly and yellow, from which it is only partially recovered; and the crop will, in some instances, inevitably be light. Upon the whole, taking this and other districts into consideration (that we have also minutely inspected), we see no reason to congratulate ourselves upon the appearance of

the crop, in its present state, reaching above an average. Of course, we can judge only from appearance—at the best, uncertain at this early period—but, comparing it with those of the seven preceding years, with an exception, it has at this season appeared equally promising; and all we grow, much as it may be, will be needed, as the stock of old wheat in stack at the present moment is not one-fourth of the quantity that was on hand at the commencement of the last harvest. This we fearlessly assert is not only the case in this, but throughout most of the wheat-producing counties. The favourable state of the weather enabled the farmer to get the land designed for barley into excellent tillage; and wherever it was sown sufficiently early to allow it to escape the effects of drought, is exceedingly promising; in many instances, however, the moisture was not sufficient to bring it into a regular state of vegetation, and such pieces will, probably, not ripen evenly at harvest. Should the weather continue propitious, we may, notwithstanding, expect a bountiful crop; and as the stock on hand both of malt and beer we believe is less than usual, the demand we hope may not be affected by the increase of duty of nearly 50 per cent. War has its requirements, and must abridge some of the comforts of every household; still we consider that the impost was not only an oppression but unjust upon the provident classes. No other description of British produce was so highly taxed as barley, and, with the present increase, is unprecedented in any other country. But, the people having anticipated that the impost must fall heavily somewhere, submit without expressing themselves strongly upon the subject. The opinion that Russia, from the first, contemplated an unjust aggression, roused every sentiment of resistance in the British mind; and never, perhaps, before was that sentiment so universal and so readily responded to by all classes. To return to our subject: we may state that with the oat crop, in repetition of what we have previously stated of barley, where sown in proper season, and a full plant, it appears exceedingly promising; but, on the contrary, where sown late, the plants will be uneven, from the circumstance of the grains vegetating irregularly, and coming up at two distinct periods of time. Peas are for the most part promising and well cultivated; but we hesitate venturing any opinion as to the result, seeing that of all crops they are most precarious and uncertain. Beans are in many instances thin in plant, and scarcely any look promising: many of the winter varieties were killed by the severe frosts of the past winter and spring, and most of the summer varieties are thin in plant from the same cause, as also from the defective quality of the seed and deficiency of moisture. The preparation of the land for vegetable crops progressed most favourably, and mangel wurzel has been extensively put in, and which the late rains have caused to plant well. Some early Swede turnips have also been sown under equally propitious circumstances; and potatoes were never put in with better prospect of successful result, so far as cultivation extends. The clover and early grasses have made but little progress: where fed early, the long continued drought, combined with feeding closely, prevented any second growth until the late showers prevailed, and sheep and cattle have suffered greatly from the inadequacy of feed. The pastures have been also equally devoid of produce, and up to the present moment the chances of a crop of grass have been slight; and throughout the midland districts, where pasture prevails as a crop, feed, if possible, is more scarce than in this county, the quantity of rain in those districts being much less than has fallen in this county. The supply of beef and mutton, under the circumstances, must be deficient, and which the Smithfield market on Monday last first indicated. The clover is deficient in plant, and the produce light. The tares are also very defective, and are considered a worse crop than has happened for several years past. A large proportion has been ploughed up, and most of those that remain are almost worthless. The fall of luns has been good, but the short supply of feed has compelled many to be kept back from market at first intended as fat lambs, and which must now be stocked for keeping, as the stinted quantity of food supplied in their young state will entirely prevent them being fattened for London market. On the other hand, store sheep have become plentiful at market, but the scarcity of food and depreciation in the price of wool have produced a decline to such an extent that but little profit will be realized by those who have kept them through the winter, the enormous price to which lambs were forced up in the last autumn

scarcely leaving a chance of any profit under the most favourable circumstances. We must, however, look for a high range of prices in every description of fat stock for some months to come.—B.—*Essex Gazette*.

SALE OF SHORT-HORNED STOCK, &c., AT EDEN, ABERDEENSHIRE.

On Wednesday, May 24th, there was sold at Eden, parish of King Edward, Aberdeenshire, an extensive and valuable stock of pure Shorthorn and Cross Cattle, the property of J. Cuninghame Grant Duff, Esq., of Eden. Mr. Grant Duff has long been famed throughout the country as a breeder of shorthorns, which valuable breed, indeed, he was the first to introduce into this part of the country. Not only has he the merit of introducing the breed into the district, but of having, by the frequent purchase of costly animals, and by great attention in breeding, done very much to maintain the character of the stock in these northern counties. His biennial sales were the resort of our leading agriculturists, who drew from Mr. Grant Duff's byres the means of improving their own stock. The sale of Wednesday was announced by the worthy proprietor of Eden as a "Displeish Sale," he having let his farms of Mains of Eden, and Bowbank, on which the chief part of his breeding stock had been kept. This circumstance gave the sale an increased importance, inducing breeders of stock to attend from various parts of the kingdom. The chief agriculturists in the north were also, of course, present.

The great excellence of the stock of short-horns was well known, and, as will be seen, these animals realized in many cases very high prices—one cow, seven years old, alone fetching 100 guineas. Much of the stock, it will be seen, returns to England, and we are only sorry to see so much valuable blood going out of the district, but it appears the purses of the Southrons were too long for local bidders, or, it may be, the former were better aware of the intrinsic value of the animals.

Among those present at the sale we noticed Messrs. Cartwright, Aynho Park, Northamptonshire; Lyall, Kincaig, near Brechin, agent for Sir James Carnegie, Bart.; Bland, agent for Mr. Tanqueray, Brent Lodge, Hendon, Middlesex; M'Lauren, agent for Lord Kinaird; Wood, Castlegrove, Strabane, Ireland; Patullo, Burghill, near Brechin; C. Chalmers, of Monkshill; W. J. Harvey, of Carnousie; Longmore, Rettie; Stuart, Sandhole, Techmury; Souter, Strocherie; Sutherland, factor on the estate of Pitsligo; Wilson, Dum; the Rev. Messrs. Bremner, Banff; Finlay, Kieg-Edward; and Todd, Alvah; Messrs. J. Longmore, Hilton; A. Longmore, Baldavie; Cruickshank, Sittytton; Geddes, Orbliston; M'William, Sheriffstown; Whitehead, Methlic; Milne, Haddo; Garland, Ardlethen; Hay, Little Ythsic; Thomson, Newseat; Murray, Auchtellaron; Copland, Haddo House; Simpson, Mains of Pitfour; Black, Cairnleith; Williamson, Auld Town of Carnousie; Morrison, Boghead; Barclay, Braes of Enzie; Bell, agent for the Duke of Richmond at Gordon Castle; Crosbie, Banff; Barclay, Yonderton; Murray, Nethermill, Cruden; Maitland, Netherdown, Insch; Noble, Berryhill, Peterhead; Taylor, Cloverickford, Old Deer; Milne, Blairshinnoch; Rennie, Mill of Boyndie; Adam, Banff; Rust, Banff; Wernham, factor on the estate of Troup; Stronach, Ardnellie; Martin, Monedie; Scott, Glendronach; Milne, Corse, near Huntly; Baikie, Pitfancy; Taylor, Mains of Towie; Donald, Bogside of Eden; Simpson, Tarvathic; Walker, Mountbleton; M'Pherson, Melrose, &c., &c.

The sale commenced about ten o'clock with the fura implements, which, along with the cross bred animals and horses, were sold by Mr. Logie, Cairnbarrow; the shorthorn stock being sold by Mr. Strafford, of London, the Editor of "Ceates's Herd Book." The implements, which included a great number of the more modern inventions for executing agricultural labour, were in excellent order, and sold at high prices. The sheep and pigs also sold well.

By this time it was past noon, and shortly afterwards the party were summoned to

THE DINNER,

Which was served in two lofts and two marquees, in which

upwards of 400 were accommodated, and partook of an excellent dinner prepared by Mrs. Chisholm, Turriff. Mr. Barclay, solicitor, Banff, was in the chair, and Mr. Longmore, Rettie, croupier. After dinner, the Chairman gave in succession The Queen, Prince Albert, and the Royal Family; The Army and Navy; Her Majesty's Ministers, coupled with the name of the Earl of Aberdeen; The Member of Parliament for the county of Aberdeen, and the Member for the county of Banff; all of which were duly honoured.

The Chairman gave The health of the Earl of Fife; Mr. Longmore, Rettie, gave The Earl of Seafield; and Mr. Chalmers, Monkhill, gave The Duke of Richmond, all of which were drunk with great applause.

Mr. GEDDES, Orbliston, then gave "The Health of Mr. C. Grant Duff," advertising at considerable length to the great pains and expense Mr. Grant Duff had bestowed in the selection of first-class pure bred stock, and to the name he had so deservedly gained for himself, especially as a breeder of short horns. He was sorry that Mr. Grant Duff was about to retire from being such an extensive breeder, as there were few, if any, in the country possessed of the same ability in selecting stock, an ability by which the breeders in this district profited in becoming purchasers at his periodical sales. Mr. Grant Duff's retiring would leave a blank in the breeders of stock that would not soon be filled up. He had no doubt of a brisk competition for the stock that remained to be sold, as he saw a great number there who, he felt assured, were anxious enough to become purchasers, and all he could say was that he could assure them that they would never repent buying out of such a stock. (The toast was drunk amid enthusiastic cheers).

Mr. GRANT DUFF returned thanks, remarking that he had frequently to thank the agriculturists of this country for the support they had given him. He had done all in his power to introduce into the district the finest breeds of cattle, and he had met with very liberal support. He now came forward for the last time to thank them for that support, and to thank Mr. Geddes for the very flattering terms in which he had proposed his health, and all the other gentlemen present along with him, for the manner in which it had been responded to. Mr. Grant Duff, before sitting down, begged to give a toast. It was to the health of the Strangers, coupled with the name of Mr. Strafford. He had asked Mr. Strafford to be here to sell his stock, because his name was in itself a sufficient guarantee of its purity, Mr. Strafford being the authority on whom all could depend, for he knew the pedigree of every pure-bred short-horn in the kingdom. If there were any flaw in the pedigree of any of the animals given as pure stock, it would be his duty to expose it, and he had no doubt he would do it. If he were not to do so, he could not be trusted. There were a number of gentlemen present from England, Ireland, and other distant parts, whom they could not have expected if it had not been through Mr. Strafford, and whose health, along with these gentlemen, he begged to propose.

Mr. STRAFFORD returned thanks, remarking that he had known Mr. Grant Duff for the last fifteen years, and had always found him sparing no expense in securing the finest breeds of cattle. The quality of his stock he had no doubt was well appreciated in the country, and any remarks of his would come in better place at the sale.

Mr. CHALMERS, of Monkhill, said he considered it a high honour to be called upon to give the toast he was about to propose. It was a lady who is well known for her good qualities in other countries as well as in this country. It was Mrs. Grant Duff, and he hoped she and Mr. Grant Duff might long be spared to live together in happiness (All the honours).

Mr. GRANT DUFF returned thanks.

Mr. HARVEY, of Carnousie, gave the health of the eldest son of Mr. Grant Duff, Mr. Mountstewart E. Grant Duff, a young man of great promise, who bade fair to be an honour to his country. He had already carried high honours, and would carry them wherever opportunity offered (great cheering).

Mr. GRANT DUFF returned thanks.

Rev. Mr. Todd, Alvah, gave the health of Miss Grant Duff. The Chairman next gave "the Clergymen of all Denominations." Mr. Grant Duff gave the health of Mr. Adam, the incoming tenant at Mains of Eden, who returned thanks. The Chairman gave "the Shippers of Corn and Cattle," coupled with Mr. Longmore, Hilton, who returned thanks. Mr. Grant Duff gave "the Memory of the late Mr. Milne, of Mill of

Boyndie, the first agriculturist in this quarter who had shipped cattle to the south"—all of which were duly honoured. Parties then proceeded to the

SALE OF SHORT-HORNS.

Mr. Strafford, in commencing the sale, remarked that, as he had said at the dinner, he had long known Mr. Grant Duff as a buyer and breeder of stock. Mr. Grant Duff had very closely followed the advice of that celebrated breeder, Mr. Bates, and with very great success, as any one might see from the character of the stock to be submitted, and as would doubtless further be proved by the prices that would be obtained. He remarked that he had great pleasure in coming from England to conduct the sale of Mr. Grant Duff's short-horned stock, which he could with the greatest confidence recommend to the attention of agriculturists.

The sale then proceeded, the bidding being brisk, and the following being the sums realized, together with the names of the purchasers:—

COWS, HEIFERS, AND HEIFER CALVES.

	Guineas.
Virginity, light roan, bred by Mr. Jobson, calved 23rd September, 1844—Mr. Sutherland, factor, on the estate of Pitsligo	23
Sonsie the Tenth, red and white, calved 22nd Jan., 1845—Mr. W. J. Harvey, of Carnousie	17
Ladye Love, roan, bred by Mr. Hall, Wiseton, calved 13th Feb., 1846—Mr. Torr, Aylesby Manor, Gt. G. Lincolnshire	80
Jeuny Lind, red, calved 17th March, 1847—Mr. Tanqueray, Brent Lodge, Hendon, Middlesex	100
Guineas, red, calved 6th March, 1848—Mr. Cruickshank, Sittyton, Aberdeen	36
Red Ladye the Second, calved 17th March, 1848—Mr. Stuart, Sandholl, Technuiry	36
Miss Bates the Second, red and white, calved 21st Jan., 1849—Mr. J. G. Wood, Castlegrove, Strabane, Ireland	70
California, light roan, calved 22nd Jan., 1849—Mr. Gibson, of Kinnmundy	45
Pure Gold, roan, calved 25th Jan., 1849—Mr. Cruickshank, Sittyton	91
Manganese, red, bred by Sir Thomas Cartwright, calved 14th Feb., 1849—Mr. Longmore, Rettie	90
Monika, red, calved 17th March, 1849—Mr. Lyall, Kincaig, Brechin	95
Day's Eye, roan, calved 14th May, 1849—Mr. Cartwright, Aynho Park, Northamptonshire	36
Iris, roan, calved 8th June, 1850—Mr. Tanqueray, Brent Lodge, Hendon, Middlesex	95
Flora Fourth, roan, bred by Mr. Trotter, calved 6th December, 1850—Mr. Wilson, Cumlidge, Berwickshire	50
Genevieve, red and white, calved 15th April, 1851—Mr. Cartwright, Aynho Park	37
Rosewood, roan, bred by Mr. Cruickshank, Sittyton, calved in February, 1852—the Duke of Richmond, Gordon Castle	66
Louise, red and white, calved 18th March, 1852—Lord Kinnaird, Kossie Priory, Inchture	40
Undine Third, light roan, calved 13th April, 1852—Mr. Patullo, Burghill, Brechin	37
Pallas, red and white, calved the 28th of April, 1852—Mr. Scott, Byres, near Fochabers	60
Astræa, light roan, calved 4th May, 1852—Mr. Tanqueray, Hendon, Middlesex	65
Venus, red and white, calved 4th June, 1852—Mr. Cartwright, Aynho Park	95
Nuggets, red and white, calved 4th Jan., 1853—the Duke of Richmond, Gordon Castle	42
Day's Eye the Second, light roan, calved 28th March, 1853—Mr. Wood, Castlegrove, Strabane, Ireland	30
Red Ladye the Third, red and white, calved 7th April, 1853—Lord Kinnaird, Kossie Priory	40
Princess Alice, light roan, calved 25th April, 1853—Mr. Cartwright, Aynho Park	30
Queen's Birthday, red, calved 24th May, 1853—Mr. Cruickshank, Sittyton	31
Accession, roan, calved 20th June, 1853—Mr. Cartwright, Aynho Park	36
Miss Bates the Third, red, calved 12th July, 1853—Lord	

Kinnaird, Rossie Priory	36
Belleville, white, calved 7th November, 1853—Mr. Anton, Clayfolds	21
Fatima, calved 14th April, 1854—Mr. Longmore, Rettie.	25
BULLS AND BULL CALVES.	
Uaurper, red, calved 2nd Jan. 1852—Mr. Cartwright, Ayuhoe Park	40
Ingot, red, with white marks, calved 14th March, 1853—Mr. Black, Cairnleith	41
Midas, red and white, calved 4th April, 1853—Mr. Cartwright, Ayuhoe Park	30
Rainbow, roan, calved 15th July, 1853—Mr. Patullo, Burghill, near Brechin	37
Ballarat, roan, calved 1st February, 1854—Mr. Souter, Strocherie	20
Constantinople, red, 22nd March, 1854—along with its nurse, a young Banffshire Cow—The Earl of Fife ..	46
Lord Raglan, red roan, calved 3rd April, 1854—Mr. Samuel Stuart, Sandhole, Technuiry	16
Schaunyl, red roan, calved 15th April, 1854—Mr. Cruickshank, Sittyton	18
Omer Pasha, red, calved 15th April, 1854—Mr. Wilson, Durn	16
Admiral Dundas, roan, calved a day previous to the sale, Mr. Sutherland, factor, Pitshgo	14
—A good price this for an animal only 1 day old.	

Mr. Logie then commenced the sale of the cross-bred cattle and the horses. Although the cross cattle did not, of course, realize such high prices as the pure bred cattle, they were certainly first-class animals, and had plenty of anxious buyers, selling as high as £24 5s. to £25 15s.

The sale of work horses was next proceeded with, when in many cases very high prices were obtained, as the following list will show: A dark bay horse, rising five years old, £37—Mr. Lyall, Kinraig, Brechin. A grey mare, rising seven years old, £52 10s.—Mr. Harvey, of Carnousie. A grey mare, rising six years old, £47—Mr. Lyall, Kinraig, Brechin. A grey mare, rising eight years old, £29—Mr. Morrison, Boghardy. A grey horse, rising eight years old, £34 5s.—Mr. Harvey, of Carnousie. A black colt, rising three years old, £42—Mr. Souter, Strocherie. A black colt, rising three years old, £13 15s.—Alexander Winchester, Banff. A dark grey colt, rising two years old, £34 10s.—Mr. Milne, Corse. A cheanul filly, rising two years old, £20—Mr. Wilson, Durn. A black filly, rising one year old, £17 10s.—Mr. Murray, Nethermill.

It is proper to add that Mr. Wilson, Durn, officiated as judge of the roup, with his usual ability.—*Banffshire Journal*

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ANDOVER MAY FAIR.—Business was dull. In the horse fair the supply was much above the general average, consisting of cart-horses principally, and of a superior description, meeting ready purchasers, and realizing highly remunerative prices, whilst horses of an inferior description were few in number and in dull trade. Of cows and pigs the supply was unusually small, and of an inferior description, with a slow sale.

ASHBOURN FAIR.—Fat cattle and sheep were scarce at this fair; very high prices were asked for both, which were in most cases realized. Store cattle, though more plentiful, still fetched high prices. Store sheep were low.

BANBURY FAIR.—We have a large attendance of buyers and sellers, cattle and sheep being very numerous, and realizing good prices. In mutton, the recent advance is quite maintained, and business is brisk. A fine day, a full town, and agricultural prospects looking up, give a tone to transpiring business events which seems to be of the most pleasing character.

BEVERLEY FAIR.—During the past week the annual Holy Thursday fair has been held at Beverley. There was a small supply of first class horses, which readily exchanged hands at high prices. The cattle fair was moderately supplied with stock, of different kinds, which sold at last market's prices.

DUNSMUIR CATTLE TRYST.—There was a large number of north country cattle, but very few good lots of stots or queys which had been bred in the district. Good fat sold readily at 8s. 6d. to 8s. 9d. per Dutch stone. Cows near calving also brought former prices; but the price of lean stock for grass was considerably lower than at Trinitymuir Tryst.

FARNHAM FAIR.—There was a good supply of all kinds (stock sheep being the exception). Mutton and beef very dear. Pigs cheap. Trade of all kinds very dull indeed.

HATHERLEIGH FAIR was well attended, cows and calves ranging from 12*l.* to 18*l.*; fat cattle about 10s. 6d. per score; steers from 20*l.* to 30*l.* per pair; barreners from 7*s.* to 8*s.* per score. There was a good supply of sheep, with a slight fall in price. Wethers, from 6*d.* to 6½*d.* per lb.; lambs, 7½*d.*; a fine lot of 20 sold for 26*s.* 6d. each; couples from 50*s.* to 55*s.*

NEWARK FORTNIGHTLY CATTLE MARKET.—There was a large supply of stock at to-day's market, and of very good quality; many sales were effected, and prices were very high. There were 1,507 sheep and 37 beasts penned.

NEWBURY FAIR.—The supply of horses was superior to any show we have had for some years past. Many of them were foreign stock. Several London dealers were present. Although the demand was not brisk, many purchases were made; the prices being much the same as those given at the late fairs. Of cow cattle there was an average number. Many were of good quality, which commanded attention. Cows with calf sold from 8*l.* to 16*l.*. Heifers in calf, 6*l.* to 12*l.*. Barrens, 7*l.* to 15*l.*

SHERBORNE FAIR was supplied with nearly three times the amount of sheep offered at the corresponding period last year, nearly 1,000 being penned. Of cattle, chiefly cows and calves, there were above 100 head offered, but they were, for the most part, in very poor condition. There was a short supply of pigs, and the quality of some of the animals was very indifferent. Business was very slack, and not many sheep or cattle changed hands. We quote hogs at 21*s.*; lambs, 14*s.* to 16*s.*; cows and calves, 8*l.* to 12*l.* each.

TEWKESBURY FAIR.—There was a large attendance of dealers. The supply of stock was unusually small; the horse fair was well attended, there being a great number exhibited for sale. Several sales took place, and generally good prices were obtained. Beef 6½*d.* to 7*d.*, mutton 7*d.* to 8*d.*, cows and calves and barrens 5*l.* well.

WILTON FAIR was very fully attended. The number of sheep penned was much below the usual average, and the sales in the early part of the morning were very dull and slow to make, but after about ten o'clock things became brisker, and by twelve o'clock nearly everything penned was sold at a small advance upon the late fairs. Couples realized from 40*s.* to 50*s.*, tegs 30*s.* to 40*s.* per head. The prize cup was awarded to Mr. Trubridge, of Wishford, for the best pen of wether tegs: 60*s.* per head was offered for them and refused; the second prize to Mr. Saunders, also of Wishford, who sold his sheep at 50*s.* per head. Mr. Spencer, of Fonhill, showed a small pen of stock tegs, which were much admired, and considered the best ever shown at the fair. There was about an average supply of cattle, and they sold readily at good prices.

IRISH FAIRS.—ATHLONE was but poorly supplied with stock of all kinds—horned cattle, horses, sheep, and pigs. In the horned stock department there were some nice lots exhibited; but the prices asked prevented several heads from changing hands. The following figures may be relied on as being correct: springers, £11 to £15; three-year-old bullocks and heifers, £8 to £10; two-year-olds, £6 to £8 10*s.*; yearlings, £3 10*s.* to £5; sucking calves, of which there was a large number, brought from 25*s.* to 45*s.* each. The sheep fair contained a limited number of hoggets and ewes, the former bringing from 30*s.* to 33*s.* each; the latter 82*s.* to 35*s.*; mutton was particularly scarce, and may be quoted at from 6½*d.* to 7*d.* per lb. Lambs averaged 18*s.* to 96*s.* each. The Horse Fair was poor in the extreme, and the business done in that department is unworthy of notice. There was an excellent supply of bacon pigs, which fetched fully on the average 55*s.* per cwt. **BALLINA.**—The show of every description of cattle was very good, and a remunerative price was obtained, especially for hullocks and springers. The market for sheep was not good, a higher figure being asked than buyers were generally disposed to give. **DUNDALK** was well attended by both buyers and sellers. Beef cows were scarce, and went from 60*s.* to 70*s.* per cwt.

sinking offal. Milch cows, on account of scarcity of grass, arising from long drought, were not in much demand, and many did not change hands. Sheep and lambs, of which there was a large supply, sold well. Mutton went at from 6d. to 7d. per lb., and lambs sold from 20s. to 27s. each. Pigs, of which the supply was large and of good quality, were enormously dear, ranging at 50s. to 53s. per cwt. Very few horses of good quality, and such as were sold brought high prices. ENNISTYMON.—The prices were similar to those above, and the attendance large. HOLLYMOUNT was supplied with the average number of stock. Prices were somewhat lower than those of previous fairs. Ewes and lambs rated at 40s., wedders 35s., and hoggets 22s. 6d. to 27s. Three-year-old heifers sold at an average of £3 15s., two-year-old ditto at £7 5s. The fair exhibited the usual run of prices quoted at late fairs. KINARVA.—There was a large supply of sheep, and, in consequence of the long drought, there was a decline in price. Ewes and lambs brought from 30s. to 36s., hoggets from £1 to £1 7s. two-year-old wethers from 30s. to 36s.—*Galway Packet*.

AGRICULTURAL QUERIES.

SIR,—Will any of your scientific readers inform me if nitrate of soda will be injured by lying for a month or six weeks mixed with turf ashes? And also if Peruvian guano will be injured by lying for a similar time mixed with dissolved bones?

SIR,—Can you inform a tenant farmer, whose rent is under £300 a-year, if he is exempt from the property and income tax, as he is given to understand he is, although he is paying the charge upon £150. If you will set me right upon this point, you will very much oblige,

Sir, your obedient servant,
Tonbridge, Kent, April 26. A TENANT FARMER.

[Under £300 rent will not exempt a tenant farmer from the property and income tax, according to the statute of last year. £290 of rent, for instance, would be liable; but £150 of income would be too much, if this is what is meant by "charge upon £150." In such a case, appeal for abatement is the course.]

SIR,—Can any of your numerous readers inform a subscriber how to cure the waybrigs on yearling calves, six out of thirteen being infected more or less with them. One, in particular, has a cluster suspended from the belly, more than a foot in length by six inches thick. The information will much oblige,
Yours obediently,
May 23. A SUBSCRIBER.

SIR,—May I trouble you to tell me, through the medium of your Journal, where I can find the best treatise on the culture of Italian ryegrass? or if one is likely to appear in your columns, by "A Practical Farmer?"

I am, sir, yours respectfully,
W. M. M.

ANSWERS TO AGRICULTURAL QUERIES.

SIR,—In reply to the agricultural query in your last, nitrate of soda would be likely rather to improve than suffer, as a manure, by lying with turf ashes, becoming more or less diffused through the ashes by deliquescence, and so more thoroughly divided for spreading on the land.

Guano, also, would be rather improved by lying mixed with vitriolated bouea (I suppose your correspondent does not mean bones in liquid solution), the acid neutralizing and fixing the ammonia. But this neutralization would hinder the solubility of the bones; so that what the guano would gain the bones would lose, if rapid effect is wanted. But where they are intended to act gradually the mixture is chemically admissible, the disintegration of the bone by the operation of the acid still leaving it in a very favourable state for the action of the carbonic acid in the soil.
J. PRIDEAUX.

To H. S., Warwickshire.—Mangel Wurzel.—Our correspondent has made a very important omission; we cannot give a fair and satisfactory answer without a knowledge of the kind of soil to which such an unusual dressing as 3 cwt. of

salt, 3 cwt. of nitrate of soda, 3 cwt. of guano, and 15 tons of farm-yard manure per acre has been applied for a mangel wurzel crop. Nor has he stated the variety of "mange's." However, we think he need not entertain any fears on a thin and worn-out soil; he will be pleased with the unwitting experiment. On a rich and suitable soil he will have to act with great caution in singling, taking care to leave a larger number of plants, but not so close as to draw each other up too quickly, and so become runners; if so, he must lop off their "leads." He may obtain much food for pigs by stripping the under leaves; the great danger is from a too rapid growth, producing leaves and "leads," instead of well-formed roots. The stripping will prevent this. We do not think the dressing so distributed will prevent the germination of the seed.—P. F.

To W. F., jun., Essex.—Lucerne.—We think our correspondent must use his best judgment as to harrowing and rolling. The seed merely requires covering slightly at one inch or one-and-a-half in depth. The drill seed-barrel, not corn-barrel, must be used. Guano should be by some means got into the soil: it will not do well on the surface, except as a top dressing to the crop when it is fairly growing. The dung should be put on before sowing. Try dunging—apply the guano: another ploughing, and all will be right.—P. F.

At the request of Mr. Coxworthy, we afford the information contained in the following table, showing the relative proportion of the elementary bodies in some of the principal agricultural productions:

DRIED AT 230° FAHRENHEIT.

	Carbon.	Nitrogen.	Oxygen.	Hydrogen.	Ashes.	Water lost in drying.
*Wheat	46.1	2.30	43.40	5.80	2.40	
Beans (haricot)		4.30				7.9
†Cabbage (hearted)		3.70				92.30
*Grass (hay)	45.80	1.50	38.70	4.99	9.01	
*Mangold wurzel	42.80	1.70	43.40	5.80	6.30	
*Potatoes	44.00	1.50	44.70	5.80	4.00	

* Boussingault. † Thier.

FORMULA FOR ESTIMATING THE VALUE OF MANURES.—The following formula for testing the manurial value of any kind of substance, where an analysis is given, should be referred to by purchasers:—

Ammonia per lb. 5½d.
Phosphates " 1d.
Phosphoric acid " 3d.

The other substances, being of little manurial value, should not be estimated. Purchasers should bear in mind that carbonate of lime is chalk, and sulphate of lime is gypsum, and from their cheapness these are always suspicious in an analysis of any kind of manurial substance or artificial manure.—*North British Agriculturist*.

TO DRIVE AWAY RATS.—A friend has just informed us of a plan he adopted to get rid of rats. His premises swarmed with them. He took a small fish hook, attached to a small wire, and suspended on it a piece of cheese, letting it hang about a foot from the ground. One of the rats leaped at it and was hooked, and set up such a horrible squeal, noise, and rattle, that all the rest forsook him and fled. Not a rat remained on the premises. A few days afterwards his neighbour declared that he was visited with a plague worse than those of Egypt—that the rats would surely cat him up, house and all. Our friend enjoyed the joke, but kept shaly. This was not philanthropic of him; so, for the benefit of his neighbour, and the rest of mankind, we "disclose the disclosure," without enjoining secrecy or charging the dollar.—*American paper*.

REVIEW OF THE CORN TRADE DURING THE MONTH OF MAY.

During the first three weeks in May we had east and north-east wind, with very little rain. On the 20th a shift in the wind to the south-west brought a rise in the temperature, and frequent showers have fallen since then. The general character of the spring has been exactly the reverse of that experienced last year. The weather was then so wet as to render it exceedingly difficult to accomplish the sowing of spring corn, whilst this year the only complaint has been the want of sufficient moisture. It has long been an admitted fact, that a dry season is favourable for wheat in this country; and judging from appearances thus far, there is certainly reason to believe that the rule will hold good in the present instance. The want of genial warmth is, however, beginning to be felt in some parts of the kingdom; and within the last few weeks we have received some rather unfavourable reports from the Lincolnshire Fens, in regard to the aspect of the wheat plant. The Lent-sown corn crops have improved since we last addressed our readers, but are generally backward for the time of year, and grass is still very short, so that hay-making is likely to be a fortnight later than usual. On the whole, there is much less to complain about than there is reason to be gratified at the aspect of the country, and we consider the prospects thus far decidedly promising for the future. The most important drawback that we have hitherto heard of, is the mischief which has been done by the sharp night-frosts experienced on several occasions this and last month. The orchards have suffered very severely, and in many localities the early potatoes have been seriously cut up. From the foregoing remarks, it will be understood that the prevailing impression is, that the winter and spring have been passed without the occurrence of anything to give rise to uneasiness in regard to the grain crops, and that if we should be blessed with as favourable a summer, an abundant (though perhaps not an early harvest) might be calculated on with a fair chance of being realized. That this feeling has had considerable influence in deterring speculators from investing in corn cannot be doubted, and it is also probable that it has induced farmers to thrash out more freely than they might have been disposed to do if the seasons had proved less propitious. This impression is partly confirmed by the increase which took place in the deliveries of home-grown wheat in the latter part of April and the first week or two

in the present month. We gave the quantities sold at the towns which furnish the returns for compiling the average for the kingdom, up to the 22nd April, in our last monthly review. We now submit the returns from that period up to the last published weekly account. At first there was, it will be observed, a decided increase; but since then a decrease has again taken place, and nothing having occurred to encourage farmers to hold back supplies, the inference is, that they really have but little to bring forward.

Week ending	Published	1854.	1853.
April 29	May 4	70,581 qrs.	74,904 qrs.
May 6	May 11	66,511 qrs.	93,936 qrs.
May 13	May 18	57,450 qrs.	95,443 qrs.
May 20	May 25	54,981 qrs.	878,44 qrs.

Taking the foregoing figures as a standard for forming an opinion in regard to the home supplies in other markets of the kingdom, it would appear that the deliveries from the farmers during the last two weeks named were only two-thirds of what they were in the corresponding period of 1853, and it is therefore not to be wondered at that the millers in the interior should have found it absolutely necessary to visit the ports on the coast where they had a prospect of meeting with foreign wheat. Such has certainly been the result of the smallness of the home supplies, and stocks have consequently not accumulated to anything like the extent which might have been expected, considering the very liberal character of the arrivals. By the official return published in the "London Gazette" of the 19th inst., it appears that the importations into the United Kingdom during the month ending 5th May consisted of

Wheat..	476,111 qrs.	Beans ..	20,911 qrs.
Barley..	63,448 „	Peas ..	6,095 „
Oats ..	121,623 „	Maize ..	163,490 „
Rye....	328 „	Flour ..	514,773 cwts.

This enormous supply, together with the large quantity which has since come to hand, has, however, failed to cause any material depression; indeed, it has scarcely sufficed to check an advance in prices, as will be shown further on. The question now is, can we reasonably calculate on supplies reaching us from abroad of a like character? That we shall still need considerable aid hardly admits of doubt. We have so frequently found that foreign merchants have sent us more than we were led to expect on previous occasions, that we are induced

to look upon the reports received from most quarters of the almost total exhaustion of old stocks with some degree of scepticism; but we must nevertheless admit that it is a difficult matter to say from whence our wants are to be supplied. The Russian ports are undoubtedly closed against us: small quantities may perhaps reach us under neutral flags, or by the way of Prussia, but the entire supply to be obtained in that way must naturally be insignificant.

The stocks at the principal Baltic ports are, according to the best information we have been able to collect, very much below what is usually held there at this period, and it is confidently reported that farmers in the interior of Prussia have little or nothing more to bring.

France is again beginning to show want, and, so far from being in a position to afford us further supplies, may be expected to require imports on rather an extensive scale before the new crop can possibly be made available. With the exception therefore of what Spain may have to spare, the resources of Continental Europe seem to have been nearly exhausted in supplying our wants thus far. Under these circumstances, we naturally turn to America; here we have the same story repeated. At the Atlantic ports the stocks of wheat and flour have certainly been reduced into a narrower compass than has been the case for years; and though considerable quantities may and probably do exist in the far west, to bring these to the sea-board will take time, and involve expense; hence it will require the temptation of high prices to draw any important quantity of breadstuffs from the other side of the Atlantic.

This being the position of affairs, we can see no prospect of a lower range of quotations this side of harvest, however auspicious the season may prove; whilst the occurrence of anything calculated to detract from the productiveness of the next harvest would be very likely to cause great excitement.

The wheat trade was, under the influence of somewhat increased deliveries from our own growers, and large arrivals from abroad, rather depressed in the early part of the month, and for a week or so, the tendency of prices was downwards, more especially at those ports which received the great bulk of the foreign supplies. The depression did not, however, last long; buyers from the interior soon made their appearance at the ports on the coast, and before the middle of the month the slight decline previously submitted to had been recovered. What has taken place at Mark Lane will afford a fair index of what has occurred in the provincial markets, except that there has been a greater degree of activity at Liverpool than with us; the difference has, however, not been so important as

to render a separate notice of the two great marts necessary, and we shall therefore confine our remarks to London. The arrivals of English wheat, though not quite so insignificant as they were in April, have nevertheless been very small, and the metropolitan millers would have been sadly puzzled if they had not had a plentiful choice of foreign to select from. The latter circumstance has rendered them in a great measure independent of the home supply, which has now become quite a secondary consideration. It may be recollected that the wheat trade finished heavily at the close of April, and the little English wheat exhibited on the first Monday in May could not be placed until factors submitted to a decline of fully 1s. per qr. A similar reduction again took place on the 8th inst.; but since then, the tendency has been the other way. On the 15th, the Essex and Kentish stands were cleared without difficulty, at an advance of 1s. to 2s. per qr., and though it was not easy to exceed this improvement on the succeeding Monday, the turn was on the whole in favour of the seller, and no part of the rise has since been lost. The arrivals of wheat from abroad into the port of London have amounted to between 70,000 and 80,000 qrs. from the commencement of the month up to the period we are now writing, and some further addition may be expected to be made to the supply before this article shall have met the eyes of our readers. There has consequently been no scarcity; but in the face of ample receipts and fine weather, importers have shown very little anxiety to realize. The country demand was not particularly active during the first fortnight in May; and whilst this was the case, prices gave way about 2s. per qr.: beyond this sellers refused to concede, and a good many were not disposed to submit to that decline, preferring to land, and wait for a renewed activity in the demand. On the 15th inst., we had rather a numerous attendance of purchasers from different parts of the kingdom, and though they conducted their operations with much caution, they were obliged to pay 1s. to 2s. per qr. more than on the previous Monday. On the 22nd, a further rise of 1s. per qr. was insisted on, which had the effect of checking business, and though the attendance was again good, the transactions were on a comparatively retail scale. New red Pomeranian wheat, such as had in the early part of the month been sold at 78s., is now generally held at 82s., and at about 1s. per qr. below that price there are willing takers. Danzig and white American wheat, being scarce, would command relatively higher terms. For the latter over 90s. per qr. has lately been realized at Liverpool. During the first fortnight in May, upwards of 100 vessels wheat-laden arrived off the coast from ports East of Gibraltar, whilst the receipts

since have not much exceeded a dozen cargoes, and the prevailing impression is that the supplies from that quarter are nearly at an end. About the period when the great bulk of the supply came to hand, prices gave way 2s. to 3s. per qr., but at least 2s. per qr. of that decline has since been recovered, and the principal part of the cargoes has already been disposed of. Some have been ordered round to London, others to Liverpool, a fair proportion to the channel ports, and a considerable number has been taken for Ireland.

The nominal top price of town-made flour has remained stationary at 70s. per sack; at one time there was some talk of putting it down, but within the last week millers have debated the propriety of raising the quotation, which, considering the value of fine wheat, they are certainly warranted in doing. Town-made household flour at first receded 1s. to 2s. per sack, which decline was subsequently recovered. The fluctuations in the price of Norfolk and other country flour have been more important, but quotations are now very nearly the same as they were at the close of last month. The arrivals from America direct have been small, and the quantity of American flour received from France less than last month. Meanwhile the demand for the article has been extensive, and stocks of good sound qualities have been materially reduced. At present good brands are worth 40s., and fine from 41s. up to 44s. per brl. Should the supplies from the other side of the Atlantic really prove as short as the advices from thence must lead us to expect, prices will probably undergo a not unimportant rise.

The increase in the malt-tax, which the Chancellor of the Exchequer has thought fit to impose, has naturally influenced the barley trade. When the intention of this measure was first made known, it produced a perfect panic, but business has since partly recovered. A more unjust step, as far as the agriculturists of Great Britain are concerned, could scarcely be conceived. Well may the English farmers exclaim against one-sided free trade! but the present Government appear to be of opinion that the cultivator of the soil will bear any amount of squeezing, and forthwith clap on an additional tax of about two and a-half millions on agricultural industry. The effect of this must be to reduce the value of barley permanently. The maltsters have found it impossible to obtain the extra 10s. per qr. duty from the brewers, and the advance in the price of malt, notwithstanding that each bushel has to bear an additional 1s. 3d. tax, has been only 6s. to 7s. per qr.

The arrivals of oats from our own coast have been very small, but from Ireland some quantity has reached us, and the arrivals from abroad have been on rather a liberal scale, having

amounted to about one hundred thousand qrs. during the month. Thus far the absence of shipments from Russia has not been felt, but we are decidedly of opinion that this grain will run very short in July and August, the two months during which we have of late years depended chiefly on St. Petersburg, Riga, and Archangel for supplies. The trade has been steady, but not by any means active, the high value of the article having had the effect of causing consumption to be economised. The tendency of prices was upwards until the 22nd inst., but within the last week the supply has rather exceeded the consumptive demand, and a reaction to the extent of 6d. to 1s. per qr. has taken place in prices. Good to fine feed oats may be quoted 30s. to 32s., Irish potato 33s. to 35s., and superior Scotch 35s. up to 38s. per qr. The prevailing impression is, that Denmark and Sweden will not be able to furnish further supplies of magnitude, and the shipments from Germany and Holland have already fallen off materially.

Beans have not met with much attention since our last, and scarcely any change has taken place in prices. The home supplies have been small, and the arrivals from foreign countries only moderate.

Peas have hung very heavily on hand; but holders have not been disposed to accept lower terms.

The arrivals of Indian corn from the Black Sea ports, though tolerably good, have been less than usual at the corresponding period of the year; any deficiency in the receipts from thence has, however, been amply made good by the supplies from America, and the value of the article has on the whole tended downwards.

In giving our usual notice of the state of the corn markets abroad, the most prominent feature will be found to be the extreme lightness of the stocks. The fact is, that with the exception of America (where the harvest gave a good return), the produce of 1853 was generally short, and the very large shipments made since then to Great Britain has left comparatively little on hand.

Letters from Danzig of the 20th inst. state that the supplies received there from Poland had been unusually light, and it was the prevailing belief that the entire quantity from that quarter would scarcely amount to two-thirds of what had come to hand the previous season. At the same time there was hardly any stock of old wheat in warehouse, and holders of the little on hand had, consequently, manifested great indifference about realizing. The advices from hence, reporting a somewhat improved demand for wheat, had had an immediate influence, inasmuch as it had rendered sellers confident of an advance, in anticipation of which more money had

been asked for the finer qualities, suitable for export, which were then quoted from 69s. up to 74s., whilst light 56 to 58lb. parcels might have been bought at 63s. to 66s. per qr. free on board, according to quality.

The latest advices from Königsberg speak of small supplies and rising prices for wheat, as well as for Spring corn.

From Stettin we learn that a good demand had been experienced for wheat, and that the tendency of prices had been decidedly upwards. Scarcely any supplies had come to hand from the interior, and the quantity on hand was trifling. Red, weighing 61 to 62lbs., was held at 70s. to 71s., and 62lbs. mixed Polish at 72s. to 73s. per qr. free on board.

We have similar reports from most of the Lower Baltic ports. The advices are almost unanimous in stating that the growers' stocks had been reduced into a very narrow compass; and it is positively affirmed that in case Great Britain should require further large supplies, it would be impossible to obtain any material aid from that quarter.

At the near continental ports a good deal of effect was produced by the rise which took place in the English markets about the middle of the month.

From Hamburg we learn that wheat had been in active request, and that sellers had consequently insisted on somewhat enhanced rates. For good 60½lbs. Wahren, on the spot, equal to 76s. per qr. free on board had been paid, and the commoner kinds were quoted from 71s. 6d. up to 74s. 3d. per qr. free on board. The offers from outports had been generally too high to allow of much business being done. The quantity of barley offered from Denmark had exceeded what had been required, and the value of this grain had receded more or less, 53lbs. quality having been offered in vain at 32s. 6d. per qr. free on board. Oats had, on the other hand, been in rather lively request, principally for shipment to England; for good qualities from Denmark, weighing 39½lbs. per bushel, 27s. 6d. to 28s., for 38lbs. from the Eyder 28s., and for fair qualities from the West Coast, weighing 36½lbs., 28s. 9d. per qr. free on board had been paid.

In the Dutch markets wheat does not seem to have varied materially: its value at Rotterdam and Amsterdam being relatively higher than in the English markets, hardly any business had, we are informed, been done for export. Oats are nearly as dear relatively in Holland as with us, and from Rotterdam there have been no offers. At Groningen and Emden this grain seems to have been in lively request to ship to England, and prices have lately been paid at those places so high in proportion to our quotations, that it will need a further rise here to insure the operators against loss.

We learn from France that, after a protracted period of dulness, the inquiry for wheat and flour had suddenly revived. This occurred in the early part of the present month, and since then rather an important advance appears to have taken place in prices. The upward movement does not appear to have been much assisted by speculation, but is rather to be attributed to the inadequacy of the supplies from the growers to satisfy the consumptive demand, whilst imports from abroad had nearly ceased. Letters from Marseilles state that a considerable demand had been experienced there from the interior, and the receipts from the Black Sea having dropped off, holders had deemed it advisable to raise their pretensions. The stocks of native-grown wheat appear to be all but exhausted in the south of France, and the quantity held in the north is also said to be very small. From Havre we learn that the stock of American flour had undergone a rapid diminution, and it is not probable that any further shipments of consequence will be made from thence for Great Britain; indeed, it is by no means certain that France may not be compelled to buy in our markets between this and harvest.

We learn from Italy that the fears entertained there in the early part of the season, in regard to the growing grain crops, had been entirely dissipated, and the prospects for the harvest were then considered promising. Under these circumstances, the corn trade had become very dull at the principal Mediterranean ports; and at Leghorn, Venice, Naples, &c., prices had receded. Old stocks being, however, exhausted in that part of the world, it is not probable that shipments will be made from thence either to this country or to France until after harvest.

The accounts from America speak very positively in regard to the scarcity of wheat and flour at the leading ports on the sea-board; indeed, so little was left on hand, that it was deemed doubtful whether there would be sufficient to satisfy the local consumption up to the time that assistance from the interior might be reckoned upon. For flour, higher prices had been paid for home use than the export houses had been enabled to give; and so little was being shipped that freights had receded materially. To Liverpool, 5½d. per bushel would have been accepted for grain, and 1s. 9d. per barrel for flour. From New York, we learn that purchases of flour had been made there on Baltimore and Philadelphia account — places which, under ordinary circumstances, usually send supplies to New York. The finer qualities suitable for home use advanced quite ½ dollar, and secondary sorts for export ¼ dollar per barrel in the course of the week; but afterwards a reaction took place, and the

latest accounts state that, with some increase in the supplies from the westward, and a falling off in the export demand, about half of the advance had again been lost.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter	
WHEAT, Essex and Kent, white.....	77 to 79	fine 81 87
Ditto ditto new.....	75	80 fine 82 89
Ditto ditto red.....	75	80 „ 84
Ditto ditto new.....	72	81 „ 85
Norfolk, Lincoln, & Yorksh., red..	71	77 „ 81
BARLEY, malting, new..	40 41	Chevalier.. 41 43
Distilling ..	37 39	Grinding.. 35 39
MALT, Essex, Norfolk, and Suffolk, new	66	67 extra 69
Ditto ditto old	64	65 „ 68
Kingston, Ware, and town made, new	70	71 „ 72
Ditto ditto old	68	70 „ 71
OATS, English feed..	28 31	Potato.. 31 31
Scottish feed, new 32 33, old 34 35	..	Potato 35 37
Irish feed, white ..	30 31	fine 33
Ditto, black ..	23 29	fine 31
RYE ..	none	—
BEANS, Mazagan.....	42 44	„ 47 50
Ticks ..	44 46	„ 48 52
Harrow ..	46 48	„ 50 54
Pigeon ..	46 52	„ 54 62
PEAS, white boilers 57 58, Maple 47 49	Grey 44 46	
FLOUR, town made, per sack of 250 lbs. —	—	„ 66 70
Household, Town 6s. 64s. Country ..	—	„ 61 62
Norfolk and Suffolk, ex-ship ..	—	„ 56 59

FOREIGN GRAIN.

	Shillings per Quarter	
WHEAT, Dantzic, mixed..	S1 to 82	high mixed 85 87 extra 90
Konigsberg	79 81	„ 82 „ 85
Rostock, new	S1 82	fine .. 83 „ 86
American, white.....	82 87	red
Pomera, Meckbg., and Uckermark, red	77 80	extra .. 82
Silesian	77 80	white 81 82
Danish and Holstein	77 82	„ none
Rhine and Belgium	—	„ old —
Odessa, St. Petersburg and Riga..	70 73	fine 73 76
BARLEY, grinding 35 38	Distilling..	39 41
OATS, Dutch, brew, and Polands 30s. 33s..	„ Feed ..	27 29
Danish & Swedish feed 29s. to 31s.	Stralsund 30	32
Russian	31 32	French.. none
BEANS, Friesland and Holstein	42 48	
Konigsberg ..	47 50	„ Egyptian .. 45 47
PEAS, feeding	50 54	fine boilers 55 58
INDIAN CORN, white.....	45 48	yellow 45 48
FLOUR, French, per sack (none) —	—	„ none —
American, sour per barrel	37 39	sweet 40 44

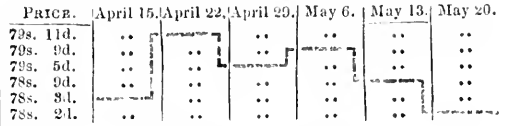
IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.		Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
WEEK ENDING:	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
April 15, 1854.	78 3	36 10	27 6	44 0	45 7	12 3							
April 22, 1854.	79 11	37 5	27 6	48 5	47 0	0 4							
April 29, 1854.	79 5	37 3	28 9	63 0	46 7	43 6							
May 6, 1854.	79 9	37 0	28 8	47 4	47 10	44 9							
May 13, 1854.	78 9	37 1	29 5	52 1	43 9	46 9							
May 20, 1854.	78 2	37 2	29 4	48 6	49 3	47 2							
Aggregate average of last six weeks	79 1	37 1	28 6	50 6	47 6	44 11							
Comparative avge. same time last year	44 5	31 5	18 11	30 6	35 2	32 11							
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.				Averages from the corresponding Gazette in 1853.			
Wheat.	Barley.	Oats.	Peas.	Wheat.	Barley.	Oats.	Peas.
Av. Qrs.	s. d.	s. d.	s. d.	Av. Qrs.	s. d.	s. d.	s. d.
54,981	78 2	29 4	32 1	57,844	43 11	29 4	32 1
13,832	37 2	29 4	32 1	12,042	30 11	29 4	32 1
13,318	29 4	29 4	32 1	13,742	19 1	29 4	32 1
190	48 6	29 4	32 1	75	35 8	29 4	32 1
4,659	49 3	29 4	32 1	4,616	36 0	29 4	32 1
329	47 2	29 4	32 1	718	32 1	29 4	32 1

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING MAY 20, 1854.



PRICES OF SEEDS.

BRITISH SEEDS.

Linsced (per qr.)..	sowing —s. to 76s.;	crushing 60s. to 64s.
Linsced Cake (per ton).....	£10 0s. to £10 10s.	
Rapeseed (per qr.).....	70s. to 80s.	
Ditto Cake (per ton).....	£6 15s. to £7 5s.	
Cloverseed (per cwt.).....	(nominal) .. 00s. to 00s.	
Mustard (per bush.) white new 10s. to 11s., brown old 10s. to 13s.		
Coriander (per cwt.).....	new 10s. to 15s., old 10s. to 15s.	
Canary (per qr.)	44s. to 50s.	
Carraway (per cwt.).....	new 42s. to 44s., old 41s. to 48s.	
Tamp, white (per bush.) —s. to —s.	Swede 24s. to 35s.	
Trefoil (per cwt.).....	18s. to 21s.	
Cow Grass (per cwt.).....	65s. to 76s.	

FOREIGN SEEDS, &c.

Linsced (per qr.)... Baltic, 64s. to 68s.;	Odessa, 66s. to 70s.
Linsced Cake (per ton).....	£9 10s. to £10 10s.
Rape Cake (per ton).....	£6 15s. to £7 5s.
Unpeeped, small, (per qr.)... —s.,	Ditto Dutch, 44s.
Tares (per qr.)	new, small 58s., large 64s.
Rye Grass (per qr.).....	28s. to 35s.
Coriander (per cwt.).....	10s. to 13s.
Clover, red.....	46s., 50s., 51s. to 56s.
Ditto, white	68s. to 80s.

BOROUGH, MONDAY, May 29.

The general accounts from the plantations continue unfavourable, and our market, in consequence, has exhibited much animation, and the recent advance in prices is fully maintained. The supply of Hops on offer is limited, and fine samples very scarce.

WORCESTER, (Saturday last.)—Reports state that the blight continues to increase upon the Hops, and causes much anxiety as to the crop. We have very few Hops on offer, and prices have again advanced 15s to 20s. per cwt. since last week: we hear of £9 having been made to-day.

MAIDSTONE, May 25.—Our hops continue to grow, and the bine seems stronger, notwithstanding the high winds and cold nights, which have done considerable injury. Fly is very prevalent, and is much on the increase: in some instances from thirty to forty have been found on one leaf. Hot sunny weather is required, and should we be favoured with it, a great change for the better may be hoped for. Duty called £140,000.

FARNHAM, May 25.—Our bine is looking up, but the long-winged fly is seen in abundance, being 10 and 12 thick on one leaf. We have had a good deal of rain.—*Sussex Express.*

POTATO MARKETS. SOUTHWARK WATERSIDE. MONDAY, MAY 29.

The following are this day's quotations:—

	s.	d.	s.	d.
York Regents	130	0	180	0
Forfarshire ditto	125	0	155	0
Perthshire ditto	120	0	150	0
Reds and Cups	125	0	160	0
Irish Whites.....	130	0	140	0

BOROUGH AND SPITALFIELDS. MONDAY, May 29.

The supplies of old potatoes on sale in these markets are limited; very high rates are demanded for them, but so little business is doing, that the quotations are almost nominal. New English are selling at from 21s. to 25s. per cwt.; but the supply is small. Very few new foreign have yet appeared.

PRICES OF BUTTER, CHEESE, HAMS, &c.

<i>Butter, per cwt.</i>	<i>s.</i>	<i>s.</i>	<i>Cheese, per cwt.</i>	<i>s.</i>	<i>s.</i>
<i>Friesland</i>	94	to 96	<i>Cheshire, new</i>	66	to 80
<i>Kiel</i>	94	93	<i>Cheddar</i>	68	80
<i>Dorset</i>	100	104	<i>Double Gloucester</i>	60	70
<i>Carlaw</i>	—	—	<i>Single do.</i>	60	70
<i>Waterford</i>	—	—	<i>Hams, York, new</i>	76	84
<i>Cork, new</i>	84	94	<i>Westmoreland</i>	72	82
<i>Limerick</i>	—	—	<i>Irish</i>	66	76
<i>Sligo</i>	—	—	<i>Bacon, Wiltshire, green</i>	66	68
<i>Fresh, per doz.</i>	11s.0d.	13s.0d.	<i>Waterford</i>	65	67

BRISTOL, (Friday last).—Butter: Shipping price, 94s. to 104s. per cwt.; firkins and crocks, 104. to 11d. per lb. Bacon, 54s. to 60s.; Hams, prime 68s. to 74s., second quality 60s. to 64s. per cwt.; mess Pork, 87s. 6d. to 90s. per brl.; beef, 105s. to 112s. 6d.; Irish Lard, in bladders, 66s. to 70s.; kegs or firkins, 62s. to 64s. per cwt.

<i>Butter.</i>	<i>Bacon.</i>	<i>Dried Hams.</i>	<i>Mess Pork.</i>
<i>May</i>	<i>per cwt.</i>	<i>per cwt.</i>	<i>per brl.</i>
26.	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
1850.	67 0 77 0	38 0 40 0	68 0 70 0
1851.	76 0 84 0	45 0 47 0	62 0 66 0
1852.	74 0 78 0	42 0 46 0	56 0 60 0
1853.	93 0 102 0	56 0 58 0	70 0 76 0
1854.	95 0 102 0	54 0 60 0	68 0 74 0

CHICORY.

LONDON, SATURDAY, MAY 27.

The supplies of foreign Chicory has become rather limited; but that of English is on the increase. All kinds move off slowly, and last week's prices are with difficulty supported.

<i>Foreign root (in £)</i>	<i>s.</i>	<i>s.</i>	<i>Roasted & ground</i>	<i>£</i>	<i>s.</i>	<i>£</i>	<i>s.</i>
<i>London</i>	10	11	<i>English</i>	16	0	20	0
<i>Guernsey</i>	10	11 5	<i>Foreign</i>	30	0	36	0
<i>York</i>	10	11 0	<i>Guernsey</i>	26	0	28	0

HAY MARKETS.

SATURDAY, MAY 27.

SMITHFIELD.—A full average supply, and a sluggish demand. CUMBERLAND.—Trade rather dull, at about stationary prices. WHITECHAPEL.—Supply tolerably good, and trade rather dull.

	<i>At per load of 36 trusses.</i>			
<i>Meadow Hay</i>	52s. to 109s.	55s. to 105s.	50s. to 160s.	
<i>Claccr.</i>	70s. 120s.	68s. 120s.	68s. 126s.	
<i>Straw</i>	36s. 42s.	37s. 44s.	36s. 42s.	

HIDE AND SKIN MARKETS.

SATURDAY, MAY 27.

<i>Market Hides, 56 to 64 lbs.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>
<i>Do.</i>	64	72	80	88
<i>Do.</i>	72	80	88	96
<i>Do.</i>	80	88	96	104
<i>Do.</i>	88	94	100	108
<i>Horse Hides</i>	6	0	0	0
<i>Calf Skins, light</i>	2	0	3	0
<i>Do. full</i>	5	6	0	0
<i>Kents</i>	7	0	8	0
<i>Downs</i>	5	0	6	3
<i>Lambs</i>	2	0	3	0
<i>Shearlings</i>	1	0	1	7

WOOL MARKETS.

BRITISH WOOL TRADE.

MONDAY, May 29.

Since our last report there has been a moderate inquiry for short-wools at previous quotations. All other kinds have met a very dull inquiry, and where sales have taken place, lower rates have been submitted to by the holders.

	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>
<i>Southdown Hoggets</i>	1	0½	—	1 1½
<i>Half-bred Hoggets</i>	1	0	—	1 1
<i>Ewes, clothing</i>	1	0½	—	1 1½
<i>Kent Fleeces</i>	1	0½	—	1 2½
<i>Combing Skins</i>	0	11	—	1 0½
<i>Flannel Wool</i>	0	10½	—	1 3
<i>Blanket Wool</i>	0	7	—	1 1
<i>Leicester Fleeces</i>	0	11	—	1 1

LEEDS ENGLISH WOOL MARKET, May 26.—There is no improvement to report in the demand for combing wools, and prices generally may be quoted lower than last week. In clothing wools there is no change.

YORK WOOL MARKET, May 25.—At this our second market for the new clip, in consequence of the continued rains of the past week having been more unfavourable for sheep shearing than heretofore, we had only 11 small sheets of new clip and 37 of old clip: one of the old and ten of the new were sold, the remainder being left over to next week's market. One sheet, containing 61 hog fleeces, was sold by Mr. Geo. Inman, of Habton, at 15s. per stone, with 10s. turn again, the buyer offering it again for sale for 10s. profit; but it did not meet with an acceptor, thus making it worth 15s. only at Bradford. At this early period of the season, and the small amount of business yet done in these markets, it is difficult to give anything like a correct report; however present appearances would seem to indicate, that low and middle cross-bred fleeces will range from 7d. to 8d. and 9d.—higher, good-bred, one-third, half-and-half, and two-thirds, in count of hog and ewe fleeces, 10d. and 11d.—and super hog fleeces, 12d. per lb., until our 700 and 800 sheet market-days. It is universally said that, in the present uncertain state of the Eastern war, and the high rates of discounts, both so unfavourable to commerce, that buyers of the new clip will not be disposed to purchase for stock.—*Yorkshire Gazette.*

LIVERPOOL WOOL MARKET, MAY 27.

SCOTCH.—As yet there is very little new wool in the market, and that for the most part in heavy condition. Prices for the moment are almost nominal; but the expectation of buyers point to a lower figure than seems likely to be realised, as the trade are almost without stock. But if growers show a determination to sell at any price, they will have to submit to any offer they can get.

<i>Laid Highland Wool, per 24lbs.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>
<i>White Highland do.</i>	14	0	16	0
<i>Laid Crossed do. unwashed</i>	14	0	16	0
<i>Do. do. washed</i>	16	0	18	0
<i>Laid Cheviot do. unwashed</i>	18	0	19	6
<i>Do. do. washed</i>	20	0	22	0
<i>White Cheviot do. . . . do.</i>	24	0	26	0

FOREIGN.—The market has a firmer aspect, although business has been to some extent interrupted by the absence of buyers at the auction sales in London.

FOREIGN WOOL MARKETS.

The public sales are now drawing to a close, and during the present week there has been a fair attendance of buyers, several having come up from the country. This has contributed to greater briskness in the biddings, which, throughout the sales, have been tolerably even; there is, however, no advance to be quoted.

MANURES.

PRICES CURRENT OF GUANO.

<i>Peruvian Guano</i>	<i>per ton</i>	£11	0	0	to	£11	10	0
<i>Do. first class (damaged)</i>		10	0	0		10	10	0
<i>Bolivian Guano (none)</i>		0	0	0		0	0	0

ARTIFICIAL MANURES, OIL CAKES, &c.

<i>Peat Charcoal</i>		0	0	0	0	0	0	0
<i>Nitrate Soda</i>		19	0	0	20	0	0	0
<i>Nitrate Potash or Saltpetre</i>		46	0	0	50	0	0	0
<i>Sulphate Ammonia</i>		18	0	0	19	0	0	0
<i>Muriate ditto</i>		22	0	0	23	0	0	0
<i>Suprphosphate of Lime</i>		6	0	0	0	0	0	0
<i>Soda Ash or Alkali</i>		0	0	0	8	0	0	0
<i>Gypsum</i>		2	0	0	2	10	0	0
<i>Coprolite</i>		5	0	0	0	0	0	0
<i>Sulphate of Copper, or Roman Vitriol for Wheat steeping</i>		44	0	0	0	0	0	0
<i>Salt</i>		1	1	0	1	10	0	0
<i>Bones ½ inch</i>	<i>per qr.</i>	0	13	0	0	19	0	0
<i>Do. Dust</i>		0	16	0	0	19	0	0
<i>Oil Vitriol, concentrated</i>	<i>per lb.</i>	0	0	1	0	0	0	0
<i>Do. Brown</i>		0	0	3	0	0	0	0
<i>Rape Cakes</i>	<i>per ton</i>	6	15	0	7	0	0	0
<i>Linsced Cakes—</i>								
<i>Thin American in bris. or bags</i>		10	17	6	11	10	0	0
<i>Thick ditto round</i>		9	15	0	10	0	0	0
<i>Marseilles</i>		10	0	0	10	5	0	0
<i>English</i>		10	15	0	11	0	0	0



